



# Journal of Arts Science and Technology

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# Editorial

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A brace of papers on the behaviour of road users and road safety opens this issue of the **Journal of Arts Science and Technology (JAST)**. JAST is an international, multi-disciplinary, peer-reviewed journal published by the University of Technology, Jamaica in both hard copy and online on EBSCOHost at <http://bit.ly/2cc9STt> and on the University's own website at <http://www.utechjamaica.edu.jm/about-utech/history-1/publications>. The journal carries papers across the diverse fields covered by the University.

The paper, **“Child Road Fatalities and Injury: An Analysis of Jamaican Road Users’ Behaviour Patterns and the Impact on Child Safety”**, cites World Health Organization (WHO) data that, globally, road traffic crashes are the leading cause of death among 15–19 year olds and the second ranked cause among ages 5–14. Road users’ negative behaviours, including “the leading causal factors for road crashes in Jamaica: speeding, tailgating, and improper overtaking”, need to be curtailed, the paper concludes, “as we seek to lower road fatalities within this Decade of Road Safety.”

The other paper in the pair considers how pedestrian knowledge, attitudes and behaviour affect pedestrian safety at one of Jamaica’s busiest road intersections for both vehicular and pedestrian traffic. The researchers found that only 39% of respondents were able to demonstrate an acceptable understanding of pedestrian related devices and paraphernalia. Their study, they said, “seeks to inform the iterative process of isolating variables, develop models, and suggest sustainable pedestrian safety solutions for Jamaica’s increasing urban population.”

This pair of papers on road safety is followed by another pair from the field of Nursing: **“Privacy and its Impact on Wound Care”** and **“The Non-Utilization of the Nursing Process to Manage Mental Illness by Registered Nurses...”**

The wound care paper notes that, “care rendered in a private environment fosters questions, patient education or teaching and return demonstration creating and maintaining a therapeutic environment.” And, while “many studies have been con-

ducted re privacy in administering patient care in general . . . few have focused directly on the variable of privacy and its relation to promoting wound healing.”

The other Nursing paper investigated how well nurses in a mental hospital used the “nursing process” to manage patients and found that “Registered Nurses had good theoretical knowledge of the steps used in the nursing process but failed to incorporate all the steps in the management of the mentally ill.” Excess workload and shortage of staff were identified as the two major contributing factors why Registered Nurses did not utilize the nursing process to its full extent.

MEDiA is an instructional software package developed for teaching Mechanical Engineering Drawing in light of certain identified teaching-learning difficulties. The next paper is an assessment of the pilot use of MEDiA. “Both the students and their teachers found the software programme effective for the teaching and learning of Mechanical Engineering Drawing concepts and also gave suggestions on how to improve the software”, the investigator reports.

Continuing with Education, the study reported in the next paper “sought to determine whether student teachers who were pursuing business studies and computer studies at the tertiary level were using ICT with a view to improving pupils’ performance”, in light of the policy intent of the Government of Jamaica to use ICT to improve teaching and learning in primary and secondary schools.

The paper which follows, also in Education, investigated to what extent business teacher educators in Nigeria transferred their use of social media and ICT in their personal lives into the instructional delivery systems used in their professional lives, finding discrepancies between usage in personal and professional lives.

A paper in Philosophy next argues that “humanity must understand reality in a new way” as a unity of matter and spirit, human and divine, which discards Western dualism and embraces the African concept of Ubuntu, “the belief in a universal bond of sharing that connects all humanity and all of reality.”

This issue of *JAST*, as usual wide-ranging, closes with a paper which analyses students’ writing errors in a university Proficiency Test in English and discusses implications for teaching English. Their findings, the authors argue, “reinforce the need to teach English as a Second Language (ESL) throughout the education system, as the errors committed by these students are consistent with those committed by other second language learners of English across the globe.”

# Child Road Fatalities and Injury An Analysis of Jamaican Road Users' Behaviour Patterns and the Impact on Child Safety

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RACHELLE McFARLANE

University of Technology, Jamaica

## Abstract

*The leading causal factors for road crashes in Jamaica are speeding, tailgating, and improper overtaking. These factors have resulted in considerable harm to perpetrators and victims – including children commuting to and from schools. WHO reports have listed road traffic crashes as the leading cause of death among 15–19 year olds and the second ranked cause among ages 5–14. Since 2010, Jamaican authorities have reported that 243 children and youth have been killed and 2,799 seen in A/E for traffic-related injuries. This research investigated the behaviour patterns of the Jamaican road users and evaluated their impact on child safety and protection. Data collected from the Road User Behaviour Survey revealed that 71% of pedestrians indicated that they 'step into the path of moving vehicles to indicate that they intend to cross'; it is recommended that road designers should raise the elevation of pedestrian crossings so as to also act as a speed reducer. This will prevent pedestrians being mowed down while using pedestrian crossings. Other variables indicated that 74% of passengers in public passenger vehicles request stops at any point along a route; while 66% of drivers proceed to overtake slower vehicles where there is an unbroken white line. These habits, and others, are significant contributory factors to the frequency and severity of road crashes. Road users' negative behaviours need to be curtailed as we seek to lower road fatalities within this Decade of Road Safety.*

**Key words:** Road safety, vulnerable road users, road crashes, hot spots, black spots, road users' behaviour, Child road fatalities, Decade of Road Safety

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## Introduction

In September 2013 the community of Chudleigh, Manchester, Jamaica mourned the death of four Holmwood Technical High School students as a result of a bus crash in North East Manchester (Sutherland, 2013). Sutherland noted in her Jamaica Observer article that this was the third tragedy within that year affecting students in North East Manchester. In agreement with Sutherland, Lindo's (2013) article reported on an earlier traffic crash that resulted in 18 Holmwood students being injured on the Pen Hill main road. Other incidents cited by Sutherland included; 2011, four students died on the Bryce Hill Road after a speeding bus crashed and overturned; 2012, 44 people injured, with eventually one death, in a collision on Pen Hill main road. Hamilton (2012) indicated that reckless driving, overloading and total disregard for other road users are just some of the infractions of illegal taxis and buses across the island; which, of course, is made possible by members of the public engaging their services.

## Rationale

The 2004 update from World Health Organization (WHO) on Global Burden of Disease indicated that 950,000 children and young adults under the age of 18 years die annually from unintentional injuries. These injuries resulted from road crashes, drowning, burns, falls and poisonings. Some of these have left some victims with some form of disability, often with lifelong consequences. These unintentional injuries account for almost 90% of the cases resulting in child death.

According to the World Health Organisation (WHO) 2008 report on Child Injury Prevention, every day more than 200 children and teenagers die from an injury which could have been prevented. The report noted that childhood injury is a major public health problem that requires urgent attention. In respect to road traffic injuries, the report highlighted that it is the leading cause of death among 15–19 year olds and the second leading cause among 5–14 year olds. Besides road fatalities, many crashes have resulted in tens of millions of children requiring hospitalisation to attend to non-fatal injuries. Road traffic crashes rank in the top 15 causes resulting in disability-adjusted life years (DALYs) lost for children aged 0–14 years (WHO, 2008).

## Purpose of the Study

In light of these worrying global trends, this research seeks to investigate the behavioural patterns of Jamaican road users and evaluate their impact on child safety and protection. Although children are defined by the UNCRC as a person below the age of 18, this research will focus on students up to age 19 due to the prescribed duration of the Jamaican education system for children at the secondary level.

## Objectives

- (a) To conduct a desk review of road safety trends and initiatives, international best practices and local accident data.
- (b) To survey the road users so as to determine their perspective on the various road safety initiatives and recently updated Road Traffic Act.

## Global, Regional and Local Road Fatality and Injury Trends

The WHO 2015 Global status report on road safety series has classified road traffic injuries as the leading cause of preventable death annually. More than 1.2 million people die each year with millions being seriously injured and having to live with long-term health consequences. In presenting the various country statistics, the report also sought to emphasize the heavy burden placed on national economies as well as on households due to road traffic injuries. Many families are driven deeper into poverty by the loss of a breadwinner, or by the expenses of prolonged medical care, or the added burden of caring for a family member who is disabled from a road traffic injury. The data presented and analysed by the WHO suggest that road traffic deaths and injuries in low- and middle-income countries are estimated to cause economic losses of up 5% of GDP.

The global rate for road traffic deaths is 17.4 per 100,000. In comparison to the varying country income groups there is great disparity with low-income countries at 24.1 per 100 000, middle- 18.4, and high- 9.2 (WHO, 2015). Within the Caribbean region Jamaica has road fatalities per 100,000 persons per year at 11.5 in comparison to Barbados (6.7), and Trinidad and Tobago (14.1). The highest in the region is Dominican Republic with 29.3 with the average for the Americas being 15.9 (WHO, 2015).

For the period 1992–2014 the National Road Safety Council (NRSC) of Jamaica has reported an average of 352 accidents annually; with 56% of these road fatalities including Vulnerable Road Users (VRUs). This figure is comparable to that of the Americas of 45% of road fatalities being VRUs. The global average estimates approximately 85% of VRUs are killed annually. VRUs include pedestrians, pedal cyclist, motor cyclist and pillion passengers. Figure 1 shows the trend for road fatalities in Jamaica, 1992–2013.

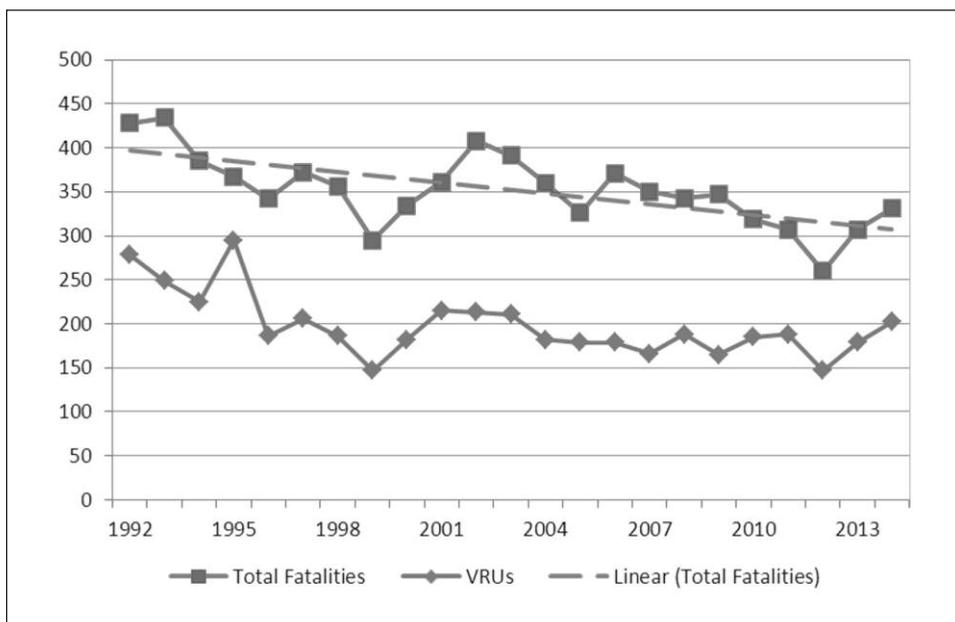


Figure 1 Road Crash fatalities for 1992–2014 (NRSC, 2016)

Dr. Parris Lyew-Ayee (2012) of the Mona GeoInformatics Institute indicated in the report for Jamaica National Foundation and JN General Insurance Company that the top leading cause of road crashes in Jamaica is tailgating. This was indicated as approximately 20% of total crashes for the period January 2000 and December 2010. Table 1 outline the top 10 factors with their corresponding percentages. However, in respect to 1679 fatal road crashes for the same period ‘Proceeding at excessive speed with no regard to conditions’ is the leading factor at 23% (Table 2). Of note is that pedestrian involvement in causes of road crashes accounted for 17% of the total.

## Child Road Fatalities and Injury

**Table 1.** Top 10 Causes of Crashes in Jamaica

Cause	Frequency	%
1. Following too close behind another vehicle	14126	19.94
2. Failing to keep to the near side or to the proper traffic lane	6884	9.72
3. Overtaking improperly on off side	4676	6.60
4. Crossing without due care at road junction	4661	6.58
5. Proceeding at excessive speed with no regard to conditions	4021	5.68
6. Swerving	3906	5.51
7. Failing to comply with traffic signs and signals	3710	5.24
8. Turning to the right without due care	3613	5.10
9. Changing from one traffic lane to another without due care	2487	3.51
10. Reverse negligently	2358	3.33

**Table 2.** Top 10 Causes of Fatal Crashes in Jamaica

Cause	Frequency	%
1. Proceeding at excessive speed with no regard to conditions	533	22.76
2. Pedestrian stepping/walking/ running/ verging into the road off footpath	217	9.27
3. Failing to keep to the near side or to the proper traffic lane	187	7.98
4. Overtaking improperly on off side	173	7.39
5. Losing control	163	6.96
6. Pedestrian crossing road from nearside	127	5.42
7. Swerving	120	5.12
8. Crossing without due care at road junction	63	2.69
9. Pedestrian crossing road off nearside	51	2.18
10. Failing to comply with traffic signs and signals	45	1.92

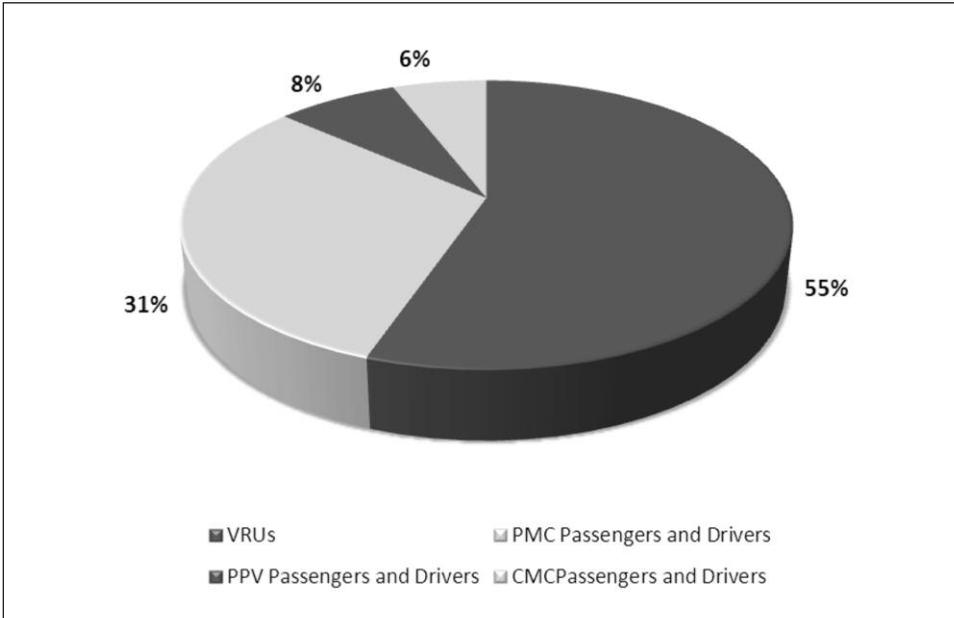
The JN Report also highlighted that, for the period under review, St. Andrew accounted for 39% of the traffic crashes reviewed with St. Ann following with 12%. It is noteworthy that 85% of the crashes in St. Andrew resulted in only property damages. The parishes of Clarendon, St. Andrew, and St. Ann recorded more than 200 fatal crashes for the period (Table 3).

**Table 3:** Severity of crashes by parish

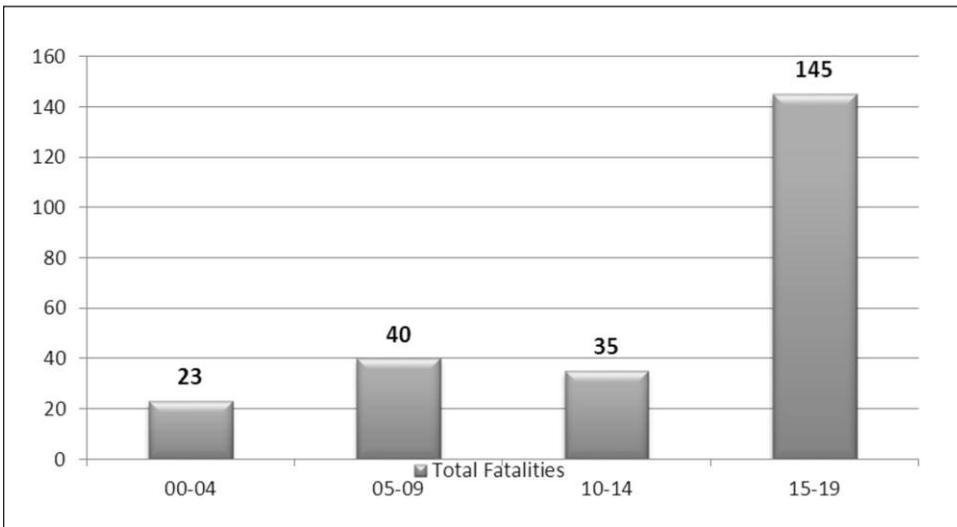
Parish	Fatal Accidents	Minor Accidents	Property Damage Only	Serious Accident	Grand Total
Clarendon	204	606	1592	402	2804
Hanover	147	110	300	316	873
Kingston	113	718	4992	676	6499
Manchester	161	629	2550	299	3639
Portland	66	332	1202	316	1916
St. Andrew	302	2509	23282	1192	27285
St. Ann	266	922	5693	1263	8144
St. Catherine	355	1562	4927	1066	7910
St. Elizabeth	117	270	824	211	1422
St. James	188	634	1947	364	3133
St. Mary	82	721	2195	393	3391
St. Thomas	52	213	546	165	976
Trelawny	95	154	501	205	955
Westmoreland	193	378	754	383	1708

For the period 1992–2014 the data collected from the NRSC indicated that road users are 31% more likely to experience a road fatality involving a Private Motor Vehicle (PMC) when compared to combined fatalities involving Public Passenger Vehicles (PPV) and Commercial Motor Vehicles (CMC) (Figure 2).

Data from the Jamaica Constabulary Force, Traffic Analysis Unit, for the period January 2010 to December 2016, showed that 243 children were killed in fatal road crashes. The 15–19 age group accounted for the highest number of fatalities, with 145 children killed. This represented 60% of the total figure for the period under review (See Figure 3). For the period under review males recorded the highest number of fatalities, with 154 deaths which accounted for 66% of the total figure.



**Figure 2** Road Crash Fatalities by Categories 1992–2014 (NRSC, 2016)



**Figure 3** Total road crash fatalities by age group for 2010–2015 (JCF, 2016)

Data from the Ministry of Health and Environment, Policy Planning and Development Division, revealed that on average 2799 children and youth ages 0–19 were seen in the A/E of various public hospitals for the period 2010–2015. For the age groups > 5 years and 5–9 years, South East region recorded the highest number of visits for the period 594 and 1221 respectively. However, for the age group 10–19 years the Western region reported the highest of 4209 visits to the A/E (See Figure 4).

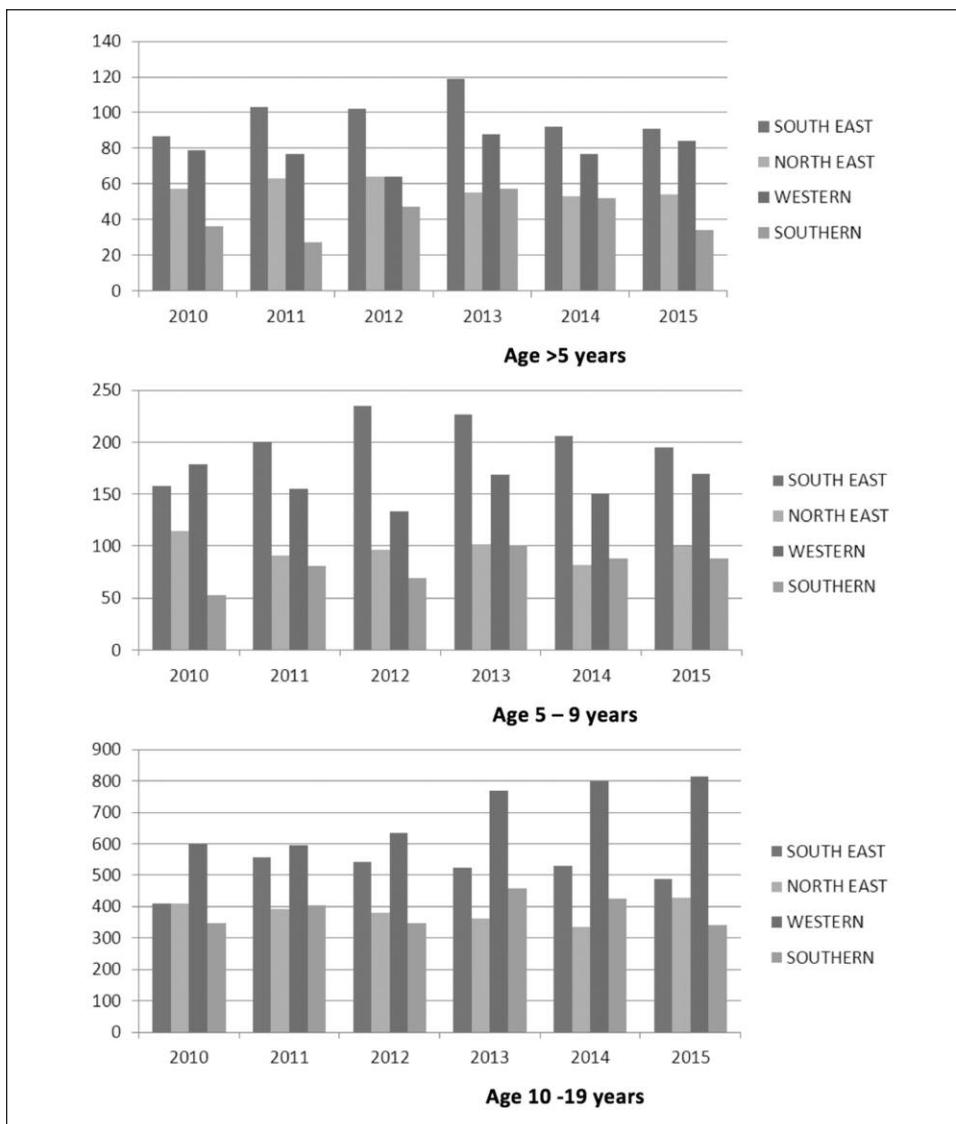


Figure 4 A/E visits for the period 2010–2015

## Economic Burden of Accidents

In Jamaica, road crashes are creating a significant strain on the Health sector and road network rehabilitation and maintenance works. It is estimated that in 2007, there were 14,069 visits to hospitals islandwide for treatment of injuries resulting from traffic crashes. These injuries are estimated to cost the health sector hundreds of millions of dollars annually (Manning, 2008). In support of this estimated cost, the Violence Prevention Alliance (VPA), chaired by Dr Elizabeth Ward, reported on preliminary findings from data gathered for 2014 that it cost close to \$2 billion to treat road-accident victims for the first three months of that year (Jones, 2016). In total it was estimated in the region of \$8 billion to treat road-accident victims at the various hospitals across the island.

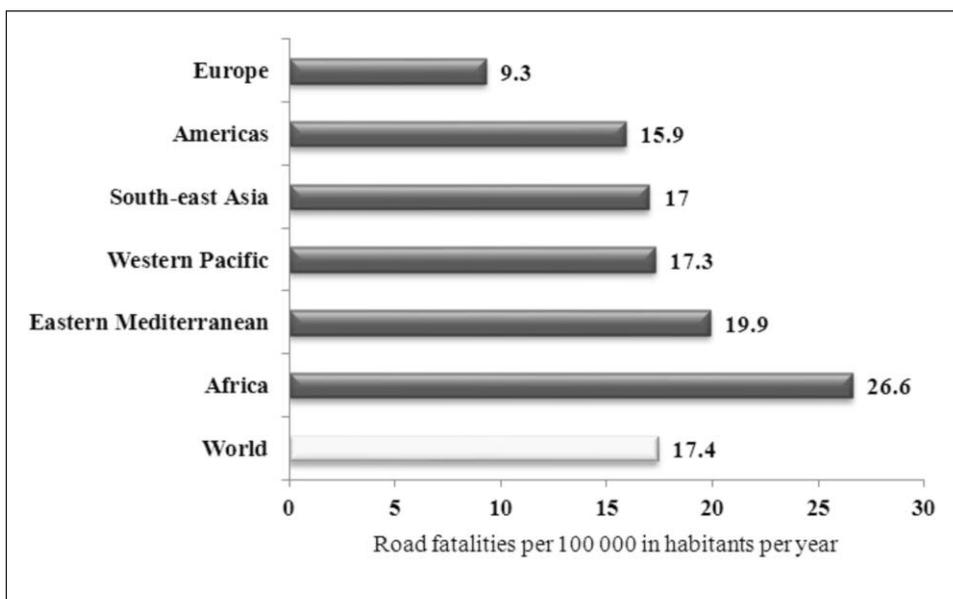
Dr Eva Lewis-Fuller, the acting Chief Medical Officer (CMO) in the Ministry of Health, indicated that the effects of crash-related trauma on the health sector affect more than just the patients involved. She outline that persons who have been awaiting surgery very often have their appointments rescheduled, as the resources are shifted to assist seriously injured crash victims (Manning, 2008). In 2016, road crashes effects on the health care facilities have continued unabated. An unknown writer for the *Observer* on August 14, 2014 shared the plight of the St. Ann's Bay Hospital that is experiencing major overcrowding in the A/E department due to traffic crashes (*Daily Observer*, 2016). In concluding the initial findings of the VPA, Ward shared that figures are showing that more than 1% of the country's GDP was expended on treating road-accident victims (Jones, 2016).

In addition to the health care sector, road crashes that destroy vital infrastructure also make a significant dent into the operations of the Ministry of Transport, Works and Housing. Speeding motorists have been blamed for the scores of non-functioning street lights on St James's Elegant Corridor, sections of which have been in darkness for several weeks (Tingling, 2015). Investigations done by the Jamaica Observer West revealed that roughly 17 per cent of the almost 800 street lights that were installed in 2014 at a cost of \$248.5 million along the 17-kilometre corridor, which runs from the Sangster International Airport roundabout to Lilliput, were out of service.

## Road Safety Initiatives

The WHO 2015 Global Report highlighted that Sweden and the United Kingdom

are the only two territories globally that have estimated road fatalities per 100,000 inhabitants per year less than 3; 2.8 and 2.9 respectively. The average for the European Union is 9.3 as shown in Figure 5.



**Figure 5** Road traffic fatalities per 100 000 population by WHO regions\*  
(\*Extracted from: WHO 2015 Global Report)

## SWEDEN AND UNITED KINGDOM ROAD SAFETY INITIATIVES

In 1995 the Swedish Transport Administration, STA, (formerly known as Swedish Road Administration) introduced a Vision Zero road safety initiative that challenged the traditional thinking of the day. At the core of the Vision Zero was the shifting of the responsibility from the road users to the designers of road transport system; road managers, vehicle manufacturers, road transport carriers, politicians, public employees, legislative authorities and the police (STA, 2015). STA supported the view that human beings are not infallible, and that road transport systems must be designed so that any mistakes will not cause serious or fatal injury.

The Economists (2014) explain that planning has played the biggest part in reducing accidents. Roads in Sweden are built with safety prioritised over speed or convenience. In addition to the safety initiatives outlined previously, there are also

pedestrian zones and barriers that separate cars from bikes and oncoming traffic. Also, pedestrian bridges and zebra-stripes flanked by flashing lights and protected with speed-bumps are estimated to have halved the number of pedestrian deaths over the past five years. The figures are quite encouraging with road deaths of children under seven having plummeted with only one death in 2012, compared with 58 in 1970. (The Economist, 2014)

In the United Kingdom road safety initiatives have focused heavily on Road User Education. One of the core initiatives by the Department of Transport (2011) in collaboration with other stakeholders was to create a road safety website; Think! Think! (<http://think.direct.gov.uk/>) is a website created to provide road safety information for road users. The aim is to encourage safer behaviour to reduce the number of people killed and injured on Britain's roads every year. Some of the contents include tips to motorcyclist, cyclist, drinkers and drug users, and games for children on road safety. Secondly, for minor road offences, in addition to fines, they have introduced mandatory community road user education programs for offenders. Lastly, prior to the construction or rehabilitation of any road network legislation has been implemented for mandatory road safety audits to be conducted and submitted to the relevant agencies.

### *Road Safety Audits*

A 'Road Safety Audit [is] an evaluation of a section of the road network during the design, at the end of construction and/or post-construction, to identify road safety problems and to suggest measures to eliminate or mitigate any concerns (Sanderson Associates, 2016). The main objectives of the road safety audits shared by Jacobs and Baguley (2004) are:

- to minimize the risk of accidents on a new road, and to minimize the severity of any accidents that do occur;
- to minimize the risk of accidents occurring on adjacent roads, and to avoid creating accidents elsewhere on the network;
- to recognize the importance of safety in road design to meet the needs and perceptions of all types of road user, and to achieve a balance where these needs may conflict;
- to reduce the long-term costs of road projects, bearing in mind that unsafe designs may be expensive or even impossible to correct at a later stage; and
- to improve the awareness of safe design practices by all involved in the planning, design, construction and maintenance of roads.

## JAMAICAN ROAD SAFETY INITIATIVES

Statistics provided by the National Road Safety Council, NRSC, indicated that in 1992 Jamaica recorded a total of 428 road crash fatalities, of which 49% were pedestrians and pedal cyclist. This statistic is indicative of the road fatalities prior to 1993 which brought national attention to the issue. The discussion of the matter at hand resulted in the formation of the National Road Safety Council in 1993 as a non-profit organization by public and private sector interest groups (NRSC, 2016). Since its inception, the NRSC has spearheaded the following initiatives;

- 1995, Breathalyser Programme
- 1999, Seat Belt Legislation and Public Education Campaign
- 2008, 'Save 300 Lives' project
- 2013, 'Below 240' Programme

To increase the effectiveness of these initiatives, the Road Traffic Act and Regulations (1939) are being repealed and replaced with a new Act that is in keeping with international best practices for road safety. The review of the Bill commenced September 9, 2014. The process is now far advanced and promulgation of the Act is expected in 2015. (ESSJ, 2015)

The 'Save 300 Lives' programme is a multi-sectoral approach to prevent and/or reduce road collisions so as to mitigate their impact socially and economically. According to the former co-chair, Earl Jarrett, the *Save 300* incorporates action from the health, transport, financial and planning spheres of government and is fuelled by a public education programme aimed at fostering good road habits among Jamaicans (Jamaica National Building Society, 2009). In 2012 the NRSC recorded the first year below the 300 mark with only 260 road fatalities (NRSC, 2016).

Following on the heels of the successes recorded in 2012, the NRSC decided to revamp their campaign the Save 300 Lives campaign. The new objective is to encourage the reduction in road deaths to fewer than 240, and the new slogan indicative of that goal is: "BELOW 240, Jamaica can do it!" (NRSC Blog, 2013).

The Transport Authority of Jamaica launched a Safe School Bus Programme on February 2, 2015 with a pilot project in the parish of Clarendon. This initiative was also supported by a public education campaign dubbed 'Choose Right, Choose Life' to encourage the use of legal public passenger vehicles (Transport Authority, 2016a). In the related Press Release dated April 15, 2016 the Authority lamented

that despite several efforts last year to implement a Safe School Bus programme in South Clarendon, some students from the participating schools refused to take the designated buses. This press release was quickly followed by another in which the Managing Director of the Transport Authority, Donald Foster, issues a stern warning to Public Passenger Vehicle (PPV) operators, to exercise due care, while transporting passengers and ensure compliance with the road traffic laws. He also called on the Parent Teachers Associations to play a greater role, in supporting the Safe School Bus programme (Transport Authority, 2016b).

In 2013, the Minister of Transport Works and Housing, Dr Omar Davies, says there will be a zero tolerance approach towards motorists who commit offences on the roadways. He pointed out that last year over 30,000 spot checks were conducted, resulting in many drivers in breach of the Road Traffic Act, being caught (The Jamaican Observer, 2013). This initiative was once again put into effect on May 7, 2016 with the Police Traffic Department implementing its much touted “Operation Zero Tolerance” in an effort to tackle the high number of road fatalities in Jamaica (RJR, 2016). During Prime Time News on Television Jamaica, May 8, 2016, one police constable indicated that the island wide initiative over the weekend result in only 2 traffic accidents which is a mark reduction from the average 5/7 accidents per weekend (Television Jamaica, 2016).

## Methodology and Research Design

The purpose of this research was to investigate the behavioural patterns of the Jamaican road users and evaluate their impact on child safety and protection. In responding to second objective of this study, a survey was used to capture Road User Behaviour. This survey instrument had a quantitative and qualitative design so to maximize the strength of each. The instrument was distributed using ‘traditional’ hardcopies and also the Google forms platform that facilitated sampling from across the island through emails, WhatsApp and Facebook.

## Method of Analysis

Frequencies and cross tabulation commands were run using the SPSS software to determine trends and relationships between variables. These were the exported to Microsoft Excel where diagrams were generated to illustrate the findings generated by SPSS tables. The findings are discussed in the following section.

## Population and Sample

As of 2014, Jamaica had a total population of 2 723 200 as reported by the Planning Institute of Jamaica (PIOJ). This population uses the national road network on a daily basis to travel to various destinations for recreation, business and school. In respect to travel, the population group 0–4 years of 195 800 infants will be deducted from the total resulting in a population of 2 527 400 using the road network. In light of this, the research seeks to target a representative sample of 150. This sample is in keeping with a confidence level of 95% (Z-score of 1.96) with a 5% margin of error (confidence interval) with a standard deviation of 0.5.

## Data Collection – Road User Behaviour Survey

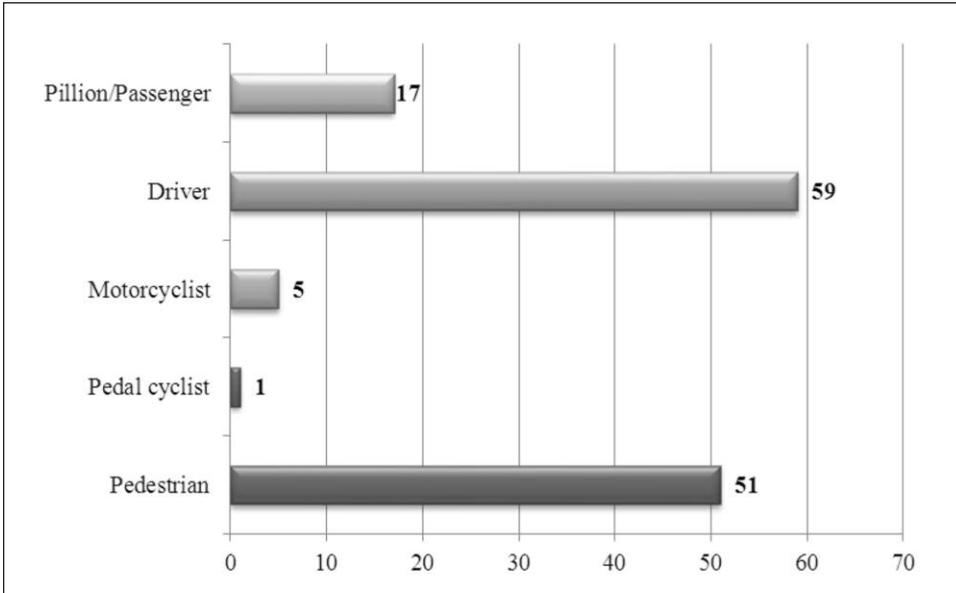
The survey consists of 51 items separated into 5 sections. Only sections A, B and F are compulsory. The other sections are to be completed based on the type of road user completing the instrument. Each section also ends with an open ended item for persons to share their general concerns as a road user traversing our nation's road ways on a daily basis. See Table 4 for a brief outline of the survey instrument. Sections B – E uses a Likert scale to have respondents indicate their level of agreement with a given statement using a 4-point scale; 1-Never, 2-Sometimes, 3-Always and 4-Not Applicable.

## Limitation of the Study

- i. Under reporting of traffic injuries to the relevant authorities; only fatalities tend to be documented and serious hospitalisation injuries. Minor injuries are only recorded as A/E visits.
- ii. A/E visit data was not available for KPH and UHWI in South East RHA.
- iii. The survey instrument did not collect the parishes of the respondents.

## Results and Discussion

Of the targeted 150 participants, only a total of 99 participants responded to the survey instrument; 57 Females and 42 Males. Sixty-three per cent of the sample indicated that they had a Jamaican driver's licence. The participants were separated into five age groups, 54% were 30-years and older, 16.2% 24–29 years, 19.2% 17–23 years, 8% 12–16 years, and 3% 6–11 years. Figure 6 indicates the breakdown of the Road users surveyed.



**Figure 6** Types of Road Users

### Pedestrian Behaviour

Using an Independent t-test, the Road User Behaviour variables for Pedestrians were compared between ‘Holders of a Jamaica driver’s Licence’ and those who do not. At a 5% significance level, there is evidence to suggest that pedestrians that have a Jamaican driver’s licence is less likely to use their ‘cell phone or other electronic devices while walking/crossing the roadway’. This is a worry finding, since it suggests that the young school age population, > 18 years, is busy using these devices while using the road network and are more than likely distracted while they cross or walk along the network. The study conducted by Dr. Parris Lywe-Ayee and his team indicated that poor use of the roads by pedestrians is the second leading cause of road fatalities across the island.

Secondly, the independent t-test indicated that holders of driver’s licence are more likely to ‘walk facing the oncoming traffic, where there is no sidewalk’, which again suggests that young road users are more likely to walk with their backs to the motorised traffic. This phenomenon is common within a number of communities across the island where sidewalks are either absent or poorly maintained. This forces the pedestrian to use the road pavement for their daily commute. This results in a

mixing of non-motorised and motorised road users along the road network. In explicably, this may have contributed to 'Pedestrian crossing road from nearside' and 'Pedestrian crossing road off nearside' also being listed in the 10 ten causes of road fatalities. These three pedestrian related causes accounts for 17% of road fatalities.

These two behaviour traits listed earlier indicated that Holders of Driver's Licence (HDL) were more cautious in their use of electronic devices and the direction of their walk with using the road ways. However, it was also observed that majority of the participants, both HDL and non-HDL, do not rely on the designated pedestrian crossings to cross the roadway. This may also be a significant factor contributing to road fatalities on an annual basis.

With further comparisons using chi-squared, evidence was presented to suggest that there was a mark difference in behaviour when looking at other behaviours. The test indicated that;

- HDL were more likely to 'step into the roadway so as to indicate to motorist that I need to cross (65% of HDL)' . ,
- HDL were more likely to 'request stops from Public Passenger Vehicles only at designated bus stops. (58% of HDL)

These behaviour factors have major implications on the traffic congestion and road crashes. For drivers and pedestrians that are obstructing the path of oncoming vehicles so as to cross the road leads to numerous rear-end collisions due to sudden stops by motorists. This is also true to the 'swerving' phenomenon that is noticed along the road ways. Pedestrians requesting stops anywhere along the route leads to unplanned stops that affect the vehicles travel behind them; this typical leads to swerving, near misses and also collisions.

## Driver Behaviour

Interestingly, the data tests did not highlight any mark behavioural difference between male and female drivers. However, using chi-square, it was observed that age does contribute to significantly observable behaviour patterns among drivers. The behaviour factors for noting were;

- Drivers 30 years and older were more likely (72%) to 'stop at the designated white lines for stop signs and traffic lights'.
- Younger drivers, those under the age to 30 years, highly likely to 'inch down

on the red light in anticipation of the green light'. (30+ Drivers – 58%, In 30+ only 55% indicated 'never')

- Younger drivers are more likely to 'watch DVDs in [their] car with [their] passengers'. (<30 Drivers – 60%)

Failure to stop at the designated white lines leads to vehicles protruding into the path of oncoming vehicles. However, from survey open feedback responses, it was noted that the driver may not always be at fault. Due to poor design of the junction and poor monitoring of the erection of structures on sidewalks, drivers indicated that sometimes their view of the road is obscured by utility poles, junction boxes, boundary walls and parked vehicles. As a result, they have to go further into the junction or road so as to see both oncoming vehicles so as to determine suitable gap acceptances for entering the road.

Lastly, as presented in the literature, traffic signalled junctions have a higher fatality rate than roundabouts. One causal factor may be the behaviour displayed locally by our Jamaican road users. If while waiting on the green, our drivers gradually do incremental creeps into the junction anticipating the green for a quick release. Simultaneously, the driver that is approaching on the other arm, when he/she sees the amber light, the survey indicated that there is a high tendency to speed up instead of slow down. This simply results in both, or more, vehicles meeting in the junction after travelling at high speeds and normally results in a road fatality.

## Conclusion & Recommendations

In concluding, the road user behaviour in Jamaica has a significant role to play in the frequency of road crashes and fatalities. The main behaviour patterns noted are quite dangerous when one adds to them the frequency and the age group of the perpetrator. In seeking to reduce the number of fatalities locally, and in turn the effects on the GDP, the NRSC and the national works agency need to bear the following recommendations in mind.

- I. Where a traffic-signal junction has a high fatality rate due to poor right turning and persons slipping left on RED. These may be converted to a roundabout. Even though, roundabouts do not necessarily reduce crashes they do significantly reduce the severity of the crash and the number of road fatalities.

2. Sidewalks should be given the due consideration as essential road fixtures that are critical in separating motorised and non-motorised, typically VRUS, road users while they use the infrastructure on a daily basis. Thus sidewalks should be a part of the road construction and rehabilitation project in communities and thoroughfares with a high pedestrian traffic volumes. They should also be in keeping with Vision 2030 and promote inclusiveness and sustainability for persons with varying disabilities that limit the mobility. Lastly, legislation should be tables and approved to ensure that sidewalks are kept clear of obstructions such as vendors, utility poles, junction boxes and vegetation over growth.
3. As being promoted now, Safe School Bus programme should be introduced and promoted in all parishes, esp. those with high fatality rates among school aged children and youth. This programme should also include transport for the elderly. Pedestrians should also be encouraged, through various education programmes to ONLY use bus stops along their designated routes.
4. Road Designers should also consider raising the elevation of pedestrian crossings. As indicated in the study, most motorists do not want to allow pedestrians to cross. As a result, the pedestrian forcibly place themselves in front of these vehicles forcing them to stop. A raised pedestrian platform will automatically deter motorist from speeding through pedestrians since it would act as a speed hump. This is critically, since it has been observed that while pedestrians are crossing, motorist still speed through and even overtake other vehicles across pedestrians.
5. The NRCS should commission road safety audits to be done at the black (hot) spots identified across the island. This will provide vital information in assisting the agency to determine whether it is the road users unsafely using the network or whether the road infrastructure was poorly designed. This latter factor can be a major contributory factor to many of the accidents in which motorist complain about poor road surfaces and alignment.
6. The NRCS can consider introducing breath-activated ignition for convicted drunk drivers. The literature revealed that this is a device that is affix to the ignition of a vehicle. The driver has to blow into it and pass the sobriety levels before he/she is able to activate the ignition. This will great reduce the repeat drunk driving offenders. The cost for the installation of the device should be borne by the convicted driver.

## Further Research

The survey sample needs to be increased to be more representative of the local population; this would enhance the observance of Road User Behaviour trends. There is also a need to conduct a separate survey possibly for motorcyclists and pedal cyclists.

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# Knowledge, Attitudes and Behavior Pedestrian Safety in Half Way Tree Square, Kingston, Jamaica

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## Abstract

*A complex relationship exists between road safety and developing countries such as Jamaica, which collectively contribute to an estimated 90% of road user injuries and fatalities worldwide. Recently published studies have revealed that a number of major urban areas within Jamaica have reported high incidences of road crashes. Of particular interest, is the occurrence of pedestrian related accidents and fatalities in the busy transportation hub known as Half Way Tree Square, despite the presence of modernized traffic safety controls. This study seeks to evaluate the knowledge, attitudes and practices of pedestrians using Half Way Tree Square and discusses the influence and presence of cultural norms, law enforcement and public awareness campaigns on these variables. Data was obtained via cross-sectional surveys administered to the pedestrian population in Half Way Tree Square and interviews conducted with expert road safety practitioners. Inferences generated from the cross-tabular analyses of pedestrian knowledge scores indicated that only 39% of respondents were able to demonstrate an acceptable understanding of pedestrian related devices and paraphernalia. Despite customary reports on road safety, there is a paucity of research on pedestrian safety in Jamaica. Therefore, this study seeks to inform the iterative process of isolating variables, develop models, and suggest sustainable pedestrian safety solutions for Jamaica's increasing urban population.*

**Keywords:** Pedestrian Safety, Road safety, Accidents, Developing Countries, Jamaica, Half Way Tree Square

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## Introduction

Approximately 1.24 million people die each year and another 20 to 50 million sustain non-fatal injuries because of road traffic crashes and collisions (World Health Organization [WHO], 2013a). Pedestrians and other vulnerable road users' account for nearly half of these deaths with the highest rates of pedestrian related injuries being observed in developing regions such as Latin America and the Caribbean (Peden, Schurfield, Mohan, Hyde, Jarawan & Mathers, 2004). Jamaica, which is part of the group of Caribbean islands, is no exception.

In Jamaica, pedestrians account for approximately one-third of road traffic fatalities annually (Road Safety Unit, 2015). In fact, for the last twenty-five years' pedestrians have reflected the highest incidences of overall road related fatalities, with the exception of two years-1999 and 2012. Beyond the human toll, road traffic injuries impair the growth and development of low- and middle-income countries by draining at least one percent (1%) of their gross domestic product, or \$65 billion annually (National Research Council, 2006) exceeding the total annual amount they receive in development assistance (Jacobs, Aeron-Thomas & Astrop, 2000).

Added to the economic difficulties they face, developing countries are challenged by a narrow range of resources, increasing population densities and urban populations – approximately fifty-four percent (54%) in Jamaica (Statistical Institute of Jamaica [STATIN], 2014), a lack of economies of scale, high transportation and communication costs as well as costly public administration and infrastructure (United Nations Environment Programme [UNEP], 2014).

At the end of 2014, the Road Safety Unit (RSU) – an extension of the Ministry of Transport and Mining, whose primary mandate has been the advocacy and implementation of road safety policies throughout Jamaica –reported that 331 persons had lost their lives in road related crashes throughout Jamaica with nearly 100 being pedestrian related (Road Safety Unit, 2015).

Based on its forecasting model, Table 1, it had been the hope of the RSU, that in 2015, there would have been a decrease by five percent (5%) in the number of *road user fatalities* and similarly, of six percent (6%) for *pedestrian fatalities*. It also estimated that the projected downward trend would continue in 2016 and 2017 with an estimated 290 and 284 road user fatalities respectively. Instead, a total of 382 road user fatalities were recorded in 2015 signifying an increase by three percent (3%).

**Table 1** Projected pedestrian fatalities by quarter, 2015–2017. Traffic Crash Report, Ministry of Transport, Works and Housing, 2015

Year	2012	2013	2014	2015	2016
Total Road User fatalities	260	307	331	382	378
Total Pedestrian Fatalities	85	89	99	91	82

At the end of 2016, there was a total of 378 road user fatalities with pedestrians accounting for twenty-two percent (22%) of such cases. Despite, there being a decrease in the number of pedestrian fatalities since 2015, the results of pedestrian fatalities for the last five years and prior, are inherently erratic and cannot with certainty suggest that there will be either a decrease or increase on a day-to-day basis.

A recently published report assessing crash incidences and their locations, as well as the type and modes of these crashes throughout Jamaica has also revealed that there is an association between crashes, high population density and activity in certain sections of urban centres, where people concentrate and serve as the foci of movement, both vehicular and pedestrian (Lyew-Ayee, 2012). The study which mapped 72,000 crashes throughout Jamaica over a ten (10) year period, also found that major urban centres such as Half-Way Tree contributed significantly to the incidences of road crashes as well as the pedestrian, bicycle, turning- and property-only related crashes (Lyew-Ayee, 2012) throughout Jamaica.

Furthermore, it is a widely-held perception – particularly among motorists plying along various points in Half Way Tree – that pedestrians are prime contributors to road traffic conflicts and collisions due to a lack of knowledge, risky behavioral practices and/or a deliberate disregard for pedestrian safety devices and controls. The information presented herein seeks to assess the knowledge, attitudes and behavioral practices of the pedestrian population, which commute within this space.

## Half Way Tree Square

Half Way Tree is located within the Kingston Metropolitan Area (KMA), Figure 1; and is one of three administrative areas within the Kingston Metropolitan Region (KMR) managed by the Kingston and St. Andrew Corporation (KSAC). The KMR constitutes an area of 30,000 acres (46.875 sq. miles) with an urban population of



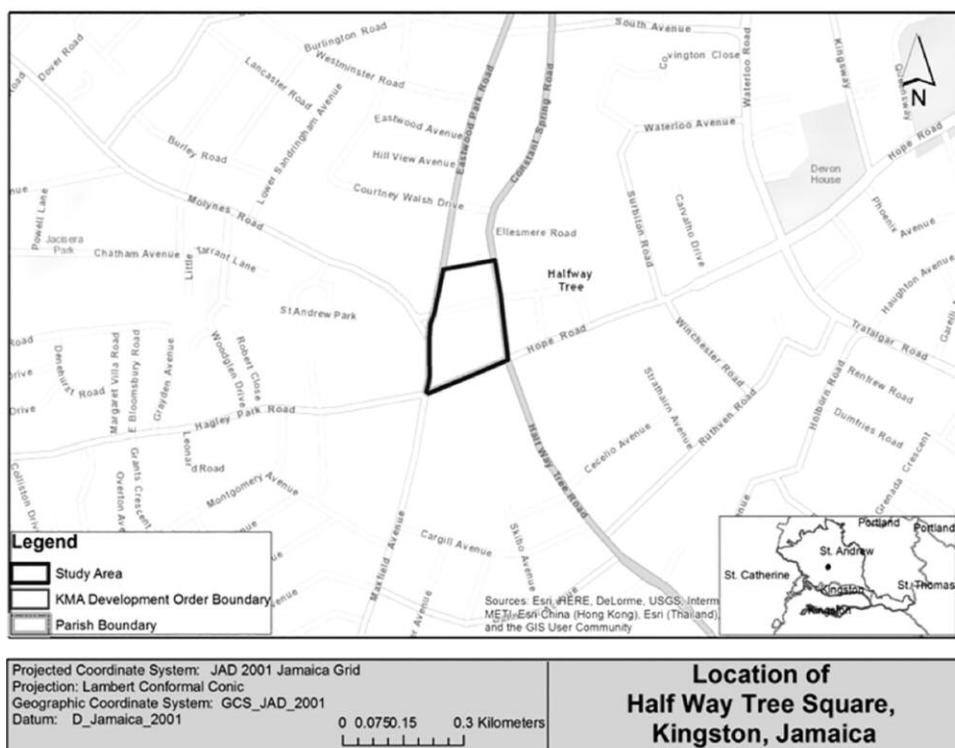
**Figure 1** Kingston Metropolitan Area, Jamaica

991,167 or 34 percent (Bailey, 2013) of Jamaica’s total population. As of the 2011 Census of Population and Housing, the population of the KMA was estimated to be 662, 426 (STATIN, 2014) or 24.5% percent of the total Jamaican population.

Notably the most marked expansion, bringing the city’s population up to the present level was mainly brought on by the advent of the motor transport which increased centralisation of the island’s communication and led to the evolution of the KMA- particularly the vicinity of Half Way Tree as a central hub for commuters travelling from the hinterland and other peri-urban areas (McHardy (2002).

Named after a venerable silk cotton (kapok) tree that stood in the square until the 1870’s; Half Way Tree, has distinguished itself as a renowned bus terminal and landmark for all categories of road users. The tree has since been replaced by a clock

tower situated at the junction of Hope, Hagley Park, Constant Spring and Half Way Tree Roads (Koss, 2008). The intersections formed by these major corridors along with arterial roads, such as North Odeon Avenue, South Odeon Avenue and Suthermere Road is generally identified as Half Way Tree Square, Figure 2.



**Figure 2.** Demarcation of Half Way Tree Square

Despite its illustrious history, Half Way Tree Square presents significant challenges for pedestrians and the motoring public, particularly with respect to the misuse of pedestrian facilities by sidewalk vendors, intersection petty traders and commercial enterprise operators. For many observers, it has become customary to see several pedestrians in the vicinity of Half Way Tree Square engaging in acts such as crossing the roadway any time even the slightest opportunity presents itself (Lalah, 2012). It continues then, that wherever there exists a conflict between pedestrian and vehicular movement, the likelihood of collision increases. Further to this, in considering all the nuances that present themselves in an environment where

the ideal scenario of compliance on the part of both the pedestrian and the motorist is almost never the case, the likelihood increases even more.

It has also become increasingly evident that local driving culture has a major influence on pedestrian safety. Similar to Jamaica, driver behaviours that affect pedestrian safety issues in Trinidad include drivers not-yielding to pedestrians; parking vehicles on footpaths and sidewalks; and encroaching on pedestrian refuge areas without due consideration when drivers are trying to avoid rough pavement surfaces such as potholes. The hit-and-run attitude especially when pedestrians are involved is also worrying. In some cases, drivers involved in such crashes may claim that they thought they hit objects other than pedestrians, which can present difficulties in processing compensation from insurance companies to crash victims and their families (Mutabazi, 2008). Along with these issues of indiscipline, Half Way Tree Square is plagued with occurrences of vandalism and destruction to its pedestrian infrastructure such as guard rails which often forces pedestrians into the road and into the traffic. On the other hand, it is also pivotal to gain an understanding of the pedestrian's perception of road usage and the extent to which he/she considers his/her practices safe and coherent with the expected pedestrian behaviour.

## Methods

Information regarding the daily distribution of the pedestrian population in the Half Way Tree Square is not yet available. The sample of respondents was therefore selected from the 2011 Population and Housing Census, which provided the total population of the KMA. To this end, the approach taken assumes a sample consisting of 398 respondents. The research utilized a mixed-methods approach to its data collection with emphasis being placed on the triangulation survey design. This approach allowed for a synthesis of both the quantitative and qualitative data in order to provide a better understanding of the research problem.

Reconnaissance site visits to the study area were conducted pre-survey administration during peak and off-peak hours to get first-hand experience of pedestrian movement and interaction with other road users. A coded questionnaire was subsequently developed to collect data on the respondent's mode and purpose of travel; comprehension of signs, signals and road marking as well as experiences with existing road and pedestrian path facilities in Half Way Tree Square. These concentrations were also supported by questions with regards to socio-demographic information such as, age, gender and parish of residence. Included in the survey

instrument were open-ended questions which allowed respondents to suggest alternatives and make recommendations for improving pedestrian behaviour and awareness in Half Way Tree Square. The purposive and convenience sampling techniques were used in the street survey. A minimum of 50 participants were selected at each of the eight (8) intersections until the required sample size of 384 participants was achieved. The study was conducted over four (4) weeks. Responses were gathered within three (3) hour intervals beginning at 6 a.m., 12 p.m. and 4 p.m. respectively. Minors and persons walking outside of these hours were excluded from the survey.

Formal interviews were conducted with technocrats in the fields of road safety, transportation planning and urban management. The general aim of each interview was to clarify the perceived association of pedestrian's behaviour, knowledge and attitude and their vulnerability to accidents and fatalities in Half Way Tree Square. The interviews also sought to ascertain information regarding existing and proposed road safety policies and practices in Jamaica.

## Data Analysis

Cross-tabular analyses and statistical tests of significance were generated to facilitate inferences pertaining to the significance of variations in patterns of pedestrian behavior relative to selected demographic and social characteristics whilst Chi-square tests and measures of associations were used to evaluate the significance and strength of the associations observed.

## PEDESTRIAN KNOWLEDGE

To assess the level of pedestrians' knowledge, a knowledge score was computed using the five survey questions relating to the use of road signals, signs, and markings. The pre-determined correct response to each questions were, for example, "When I see the **DON'T WALK**/upraised hand signal" (question 13); "When it is safe, leave the curb and cross the street" (question 14).

The results outlined in Table 1 indicate that only 27.3 percent of respondents were able to state correctly the meaning of the Red Flashing Don't Walk signal which indicates that pedestrians should not start crossing while only 38.8 percent were able to correctly state the purpose of the birdlike sound at pedestrian crossings. The results suggest that pedestrians using the area are generally knowledgeable about how to use road signals and signs. However, continued educational cam-

**Table 1:** Knowledge (%) of Respondents on Road Signals

Question No.	Questions	Number correct (# of respondents)	Percent (%)
13	When using a signalised pedestrian crossing/crosswalk, when should you cross?	254 (n=363)	70
14	What does a steady <b>WALK</b> symbol mean?	331 (n=362)	91.4
15	What does the <b>RED FLASHING DON'T WALK</b> or upraised hand signal mean?	99 (n=362)	27.3
16	What does the steady <b>DON'T WALK</b> mean?	328 (n=358)	91.6
17	What is the purpose of the birdlike sound at pedestrian signals?	139 (n=358)	38.8

paigns are needed to inform pedestrians and the wider population of non-standard approaches such as the audible signals and flashing signals.

A “dummy variable” was also created to further reflect whether a response should be deemed correct or incorrect. An “incorrect response” = 0 and “Correct response” = 1. The items were summed for the correct responses, percentages found and then distributed into two groups, Table 2. The distribution used was the 50<sup>th</sup> percentile. Respondents who received a score of sixty percent or less were classified as having

**Table 2:** Percentage Distribution of Respondents Knowledge Score

Score (%)	Number	Percent
0	5	1.5
20	10	3.1
40	60	18.6
60	126	39
80	85	26.3
100	37	11.5
<b>Total</b>	<b>323</b>	<b>100</b>

'little or no knowledge', while those who had a score over sixty percent were classified as 'Knowledgeable'. A score of 60% was seen as "very good" performance in this knowledge test as the population studied comprised of a mixture of persons with varied educational background. The majority of these respondents (39%) received a percentage score of 60, 23.2 percent received scores less than 60, while 37.8 percent obtained higher than 60.

As an additional measure, the knowledge score along with socio-demographic variables, such as age and gender were also used to compute a one sample t- test. The purpose of the one sample t-test was to determine if the two groups have different means, for example, do male and females differ in their knowledge of Pedestrian Road Signals and Signs. The results of the t-test comparing the knowledge scores between males and females revealed that there was a statistical significant difference in the scores for males ( $M=58.6$ ,  $SD=23.0$ ) and females ( $M=66.4$ ,  $SD=20.1$ );  $t(321) = -3.1$   $p = 0.002$  with men showing a greater inclination to negative behaviours in respect of the usage of the road signs and signals. Individuals below the age of 20 appear to be least indulgent as it relates to issues of pedestrian safety.

Similarly, a one-way ANOVA was computed to determine the effect of age on knowledge of respondents towards the proper use of road signals. The results indicated that there was a statistical significant effect of age on knowledge with  $p < 0.05$  [ $F(5, 316) = 2.513$ ,  $p = 0.030$ ]. The Post hoc comparison using the Tukey HSD test indicated that the mean score for the 51-60 years' age group ( $M=81.25$ ,  $SD=17.08$ ) was significantly different than the Below 20 years ( $M=63.23$ ,  $SD=22.09$ ), 20-30 years ( $M=63.80$ ,  $SD=20.37$ ), 31-40 years ( $M=63.86$ ,  $SD=24.38$ ), 41-50 years ( $M=60.63$ ,  $SD=16.45$ ).

## PEDESTRIAN ATTITUDES AND BEHAVIOURS

Understanding the spread of knowledge across varying demographics is critical in isolating target groups; particularly as it relates to conceptualizing the appropriate interventions aimed at improving pedestrian knowledge and perception. To determine the respondent's attitude towards the traffic safety devices, an attitude score index was computed using the following questions, Table 3; Do you think it is important to cross the street only at pedestrian crossings/crosswalks? Do you feel safer when using the crosswalk? and Should there be a law in Jamaica for pedestrians who cross streets carelessly (jaywalk)? A "dummy variable" was first created for each of the three questions to reflect the response, Negative Attitude (no) = 0 and

**Table 3:** Attitude Towards Pedestrian Crossings

Statements	Agree	Disagree	Total
It is important to cross the street only at pedestrian crossings/crosswalks	70.3	29.7	100
I feel safer when using the crosswalk	85	15	100
There should be a law in Jamaica for pedestrians who cross streets carelessly	77.4	22.6	100

Positive Attitude (yes) =1 and then computed by summing the individual responses to the three questions. The sum of all three statements for each respondent shows his/her total score on the scale.

The maximum possible score on the attitudes scale was 3 and the minimum score was 0. This meant that the highest scores on the scale reflect positive attitude and the lower scores reflect negative attitudes towards traffic safety. The frequency for the index created ranged from 0–3. These scores were distributed into two groups, namely; Negative attitude, and Positive attitude, Table 4. Respondents who received a total score of 0 or 1 were classified as having a negative attitude while respondents who received a score of 2 or 3 were classified as having positive attitude. Of the total number of respondents, 243 (15.3%) had a positive attitude (scoring 2 and above) towards use of pedestrian crossings. The figure also breaks down each attitude description by knowledge level.

**Table 4:** Attitude Towards the Use of Pedestrian Crossing by Knowledge of Road Signals and Signs

Attitude		Knowledge Score		Total
		Little Knowledge <60%	Knowledgeable ≥60%	
Negative Attitude	N	13	31	44
	Percent	20.30%	13.90%	15.30%
Positive Attitude	N	51	192	243
	Percent	79.70%	86.10%	84.70%
Total	N	64	223	287
	Percent	100.00%	100.00%	100.00%

## Discussion

The risk of pedestrians to accidents and collisions is multifactorial and comprises a combination of driver and pedestrian behaviour as well as poor engineering. Despite the quarterly and annual publication of empirical data that glaringly associates speeding with incidences of accidents and fatalities, particularly in areas where there is a high population density such as Half Way Tree Square, there are some who consider the present speed limit of 50 km/hour as too slow. Furthermore, throughout the Square, drivers are often observed blatantly disregarding traffic signals. In other cases, drivers do not yield for pedestrians, often considering them a nuisance to vehicular traffic rather than seeing them as part of the overall traffic population.

Pedestrians themselves, often misjudge the speed of vehicles when choosing a 'gap' in the traffic to cross the road particularly where motorist travel at too high speeds or overtake just before pedestrian crossings. Nonetheless, pedestrian behaviour is often not straightforward travel from one place to another. Pedestrians usually choose the shortest route, do not want to spend any extra time on the trip and obey the rules when they think it is sensible and necessary (Global Road Safety Partnership, 2015). As a result, pedestrians tend to jaywalk. Evidence of negative attitudes towards pedestrian safety may be attributable to, as per Pline's (1999) inference that pedestrians often consider themselves outside of the law and enforcement of their behaviour typically is low. They may not obey traffic lights, if waiting for the green light seems to take too long and those using familiar routes tend to pay less attention to traffic than when walking in unknown surroundings (Global Road Safety Partnership, 2015).

This is clearly evident through Half Way Tree Square. The National Works Agency (NWA) along with other related government funded transportation agencies such as the Jamaica Urban Transit Company (JUTC) have implemented a number of dedicated facilities, infrastructure, and engineering solutions to cater for pedestrians along the Half Way Tree corridor. These include the re-routing of JUTC buses to accommodate an all-pedestrian phase in traffic signals along South Odeon and Hagley Park Roads, audible pedestrian crossing signals, countdown signals, and tactile pavement. The NWA follows a number of design standards adapted from, but not limited to, the American Association of State Highway and Transportation Officials (AASHTO) and the Design Manual for Roads and Bridges (DMRB) and have tailored them to suit specific needs in Jamaica. Regardless of

these efforts, there are challenges to their effectiveness. On several occasions pedestrians can be seen walking in the direct path of these vehicles. Additionally, a number of sidewalks and other highway facilities are either below the minimum design requirements or are in need of repair and rehabilitation. This, as well as the proliferation of vending activities along the already narrow sidewalks, directly affects the movement of pedestrians in zones designed specifically for them. The issue of economics remains a detriment to implementing certain useful engineering solutions. The NWA has indicated that whereas the Government is generally accommodating to implementing engineering solutions for improving pedestrian safety, it is often delimited where the sourcing of funds are concerned. In light of this, there are only a limited number of features currently in use.

The Jamaica Constabulary Force (JCF) has indicated that on any given shift, at least twenty (20) police officers are on duty in the Half Way Tree area. While this may be commendable, it raises even more questions as to the resources of the JCF in effectively curtailing pedestrian and motorist behaviours in an area, which records high incidences of crashes and fatalities. The issue of illegal vending and pawning of items along sections of the Half Way Tree corridor, frequent occurrences of illegal drop-offs and pick-ups along with the competitive 'bidding' of unregistered taxis against JUTC buses for passengers whilst in traffic and other crimes further compound the issue as to whether the number of police officers provided in the Half Way Tree area are sufficient to address the risks presented.

There also appears to be a misconception that all pedestrians understand the basic rules of the road and traffic control devices. A study of 1,297 signalized intersections in 15 U.S. cities also revealed that compliance with pedestrian signals is generally poor, with violation rates of the DON'T WALK signal being higher than 50 percent in most cities. It posits that the presence of a pedestrian signal may create a false sense of security, leaving pedestrians with the impression that they are fully protected and the use of flashing DON'T WALK signals for clearance is not well understood (Zegeer, Opiela, and Cynecki, 1982). The data also revealed that some pedestrians, especially older ones, are sometimes confused about how to respond to the DON'T WALK signal when it comes on after they are partway across the street and about one-half of road users think that a flashing DON'T WALK signal means they should return to the curb where they started. The intent of the message is to say "don't start across," but this is not at all obvious (Zeeger et al, 1982). The pedestrian population also includes many persons who are not familiar with traffic laws (one does not need to pass an examination to

become a pedestrian) (Homburger, et al., 2001). This argument is also supported in the results generated. It should also be noted that many road users have no choice but to walk, and at various times all users of the roadway system are pedestrians (Dewar, as cited in Pline, 1999, p. 36).

The concept of pedestrianization advocates the removal of vehicular traffic from city streets or restricting vehicular access to streets for use by pedestrians. It would be utopic to institute full-time pedestrianization in which there is absolute exclusion of vehicular traffic except for emergency vehicles or part-time pedestrian streets in which vehicular traffic is eliminated for certain hours of the day or certain days of the week in Half Way Tree Square. However, these approaches may not be best suited for Jamaica at this time and as such may not garner sufficient support from technocrats and stakeholders. Half Way Tree Square in particular is heavily commercialized and forms a one way coupling which currently transports about forty-five percent (45%) of morning peak traffic within the KMA (NWA, 2015). Partial pedestrianization may be a more feasible approach so that vehicular traffic is restricted to slow moving public transport vehicles only or introducing traffic-calming measures that allow a mix of pedestrians and motor vehicles moving at a much lower speeds than currently exists.

A formalized Pedestrian Master Plan is also essential to guiding the process of developing, building, improving and maintaining pedestrian infrastructure at various segments of the KMA. Some areas of focus should include:

1. Safety – Create an environment safe from automobiles that encourage pedestrian mobility.
2. Accessibility – Provide barrier free mobility for all populations.
3. Education – Raise awareness of all groups involved in the pedestrian environment regarding safe practices, rights and responsibilities.
4. Connectivity – Create a pedestrian system to enable pedestrians to move comfortably between places and destinations.
5. Land Use – Link land use, transportation and pedestrian systems to encourage mixed-use development patterns.

Engineering or physical changes to the environment is often the most appropriate countermeasure for safety, whether fully or in part. The inclusions of specialized countermeasures, such as auditory signals for pedestrians have been designed primarily for those who are blind or have low vision. There is reason to believe they would be effective safety devices for sighted pedestrians as well.

A study by Van Houton, R., Malenfant, Van Houton, J., and Retting (as cited in Pline, 1999, p. 47) examined the influence of three verbal messages for pedestrians to see if these would reduce pedestrian/vehicle conflicts at intersections. The messages, spoken by either a woman or child, just before the walk signal was illuminated and indicated to pedestrians that they should wait for the WALK signal OR WATCH FOR TURNING VEHICLES. The results of the study revealed that during the baseline conditions, 16.3 percent of pedestrians did not look for threats and there was average of one conflict per session (48 pedestrians observed). The auditory signal also reduced those not looking for threats to 4.2 percent and conflicts to 0.25 percent per session. A second baseline measure revealed that those not looking were reduced to 13.3 percent and 0.6 actual conflicts per session, while a reintroduction of the auditory messages reduced not looking to 4 percent and conflicts to zero. The use of the child's voice also resulted in a greater reduction in pedestrians not looking for threats.

Guidelines as to how pedestrians should operate can be found in the Road Traffic Act, 2016. Nevertheless, implementation of jaywalking regulations may assist in curtailing the incidences of pedestrian accidents and fatalities throughout Half Way Tree Square and other such transportation hubs. However, the necessary infrastructure and partnerships with law enforcement has to be established as well as greater efforts to educate the public in order to facilitate this process. Research suggests that enforcement is a much stronger deterrent than the severity of penalty because of the perception of a likelihood of being caught. As such, where possible, enforcement needs to be made more visible. Enforcement alone is not the answer but it can make an enormous impact. A positive and infectious environment should be created for public awareness of pedestrian safety and road safety concerns.

## Conclusion

The alarming prevalence of pedestrian related crashes and fatalities in Jamaica and other developing states is cause for concern. This issue is magnified in areas of high vehicular and pedestrian movement such as the Half Way Tree Square in Kingston, Jamaica. In such instances, combatting the high risks of injury and fatality becomes critical and involves not only an assessment of motorist behaviour, but requires also an understanding of the level of pedestrian awareness as well as their attitudes and tendencies while they traverse.

Within the constraints of the study, the findings indicate conclusively that while

pedestrians seem to be satisfactorily aware of the presence and significance of a number of traffic markings, signals, and signs, this knowledge does not effectively translate to proper road use and practices. Instead, feedback from pedestrians indicates that irrespective of awareness the tendency is to disregard simple safety features such as pedestrian crossings and designated pedestrian walkways within guardrails. Whilst primarily innate, these behaviours demonstrated by pedestrians seem also to be instigated by certain secondary sources such as, but not limited to, congestion due to inadequate sidewalk spaces, the proliferation of vending activities, the belief that the location of a pedestrian crossing (and other pedestrian aid) is inconvenient, or the deliberate canvassing from route taxi operators for passengers.

The consensus that exists therefore, is that the reduction in risks of pedestrian injury and fatality requires a holistic, multi-faceted approach inclusive of intra-agency and stakeholder collaboration, the implementation of policy and legislation to curb negligent pedestrian behaviour, the enforcement and regularization of these enactments, as well as the establishment and continuous maintenance of effective and economically feasible engineering solutions to aid pedestrian movement.

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# Privacy and Its Impact on Wound Care

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## Abstract

*The purpose of the study is to determine and evaluate the relationship between privacy and its impact on wound healing, employing a descriptive survey design and using quantitative methods. A convenience sample was used consisting of 28 patients needing wound care at a rural health center. A respondent rate of 68 % (19) was achieved. The results showed 95% (18) were receiving wound care for a period greater than two (2) months. The areas of the body for dressings were 84% (16) limbs (upper or lower extremities) while 11% (2), to the abdomen requiring undressing partially or fully. 68% (13) asked staff performing dressing to hurry in completing, while 32% (6) respondents noted that though uncomfortable with minimal privacy, they asked questions, acknowledging the need for education.*

*Of the respondents 89% (17) agreed that privacy will improve education in the wound care area, 13 (68%) rarely asked questions, due to fear of being overheard by others but 3 (16%) asked questions regardless of bystanders or being overheard. In the privacy rating for wound care 26% (5) selected a rating of poor.*

*Care rendered in a private environment fosters questions, patient education or teaching and return, creating and maintaining a therapeutic environment. Many studies have been conducted re-privacy in administering patient care in general but few have focused directly on the variable of privacy and its relation to promoting wound healing.*

**Keywords:** wound, patient, healing, therapeutic, privacy, education

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## Introduction

The psychological factors which affect treatment compliance behavior of individuals needing wound care can be explained by age, gender, financial status, and level of education, nutritional status/diet, family support and understanding of the disease or illness, as well as communication (Sridhar & Madhu, 2002). According to Bateman and Snell, (2002) motivation is the force that energizes, directs, and sustains a person's efforts. It is important to assess the learning environment of the patients to ensure that it is conducive for learning by providing comfort and privacy (Falvo, 2003).

Privacy in administering nursing care can be considered a right, as well as some may say it is a necessity. 'Rights' creates a space in which people can act how they choose to, so for this to occur there must be a space in which privacy is not threatened, but in which it can be protected by people who value it (Privacy Fundamentals, 2003). It is now evident that privacy is the right of individuals to keep information about them from being disclosed, they should be able to decide who, when, and where to share their health information (Erickson & Millar, 2005). In agreement to this the World Health Organization (WHO) states that privacy is the fundamental right of a patient in receiving care, which helps to establish and maintain a therapeutic environment of trust fostering and promoting health through the mobilization of education. When the caregiver does not have the ideal physical environment to work with, this can lead to a decrease in patient privacy and dignity during care (Privacy Fundamental, 2003; Erickson & Millar, 2005 Wound Institute, 2011).

The purpose of this study was to determine the extent of decreased privacy on patient education and compliance regarding wound care and to note if making the area more conducive to privacy will increase patients' spirit of inquiry, compliance in care and comfort thus promoting wound healing (Ethics in practice, 2003). A descriptive survey design using quantitative methods was employed with convenience sampling.

Privacy protects individual independence. It fosters healthy performance by providing required opportunities to settle down, to be one's self, to expressively voice, to get away from the stress associated to daily life and to manage bodily functions. Many factors affect the healing of wounds; therefore wound healing is a complex process involving the patient, the environment and the health care professional. Education of the patient helps to heal wounds through self-care and prevent

re-occurrence. As soon as privacy is invaded or violated, through unsuitable environmental setting it allows for one being overheard and possible unauthorized dissemination of patients' personal data (Margulis, 2003).

Therefore lack of privacy can be viewed as a barrier to education, challenging the one of the primary tasks of nurses, which is to educate our patients. The teaching sessions encompasses a wide area, such as; medications, various clinical skills and procedures, wound care, identifying disease signs and symptoms, positive health practice, and how to continue caring for themselves at home and more. The lessons can take place as unplanned answers to questions from the patients' or formal training which may comprise of preparation and training supplies (Alspaugh, 2012).

The esteemed psychologist Abraham Maslow's hierarchy of needs speaks about privacy in care and how it can help an individual to meet their lower level needs leading to an ascend to higher level needs and eventually self-actualization. In a private setting where patients feel that their self-dignity is respected, they are encouraged to ask questions regarding their care which provides the ideal situation to have educational sessions and return demonstration, which facilitates patients' ability to continue proper home care. Increased understanding of one's diagnoses and treatment is an empowering factor in ensuring rehabilitation or healing is achieved and maintained (Paris & Terhaar, 2011). The fundamental nature of care, is the main objective and continues to be high on the agenda which seeks to utilize benchmarks such as do not disturb signs, staff guidance or chaperone and increased education to all staff (Erickson & Millar, 2005).

In all work environments the setting is vital in ensuring that the job is carried out with excellence, leading to less stress enabling patient dignity, privacy in care, promoting education and health based on societal expectations (Erickson & Millar, 2005). A decrease in environmental privacy has led to increased anxiety among patient, and nurses, impinging on the quality of care administered. Most of the previous studies done on privacy in administering care highlights mostly excerpts on its' relation to the privacy of the physical environment with none showing studies in Jamaica or the Caribbean. Studies were done mostly in Europe and North America but were used to support the situation in Jamaica.

## Purpose of the study

The research sought to determine and evaluate the relationship between privacy and its impact on wound healing.

## Significance of the study

This study is useful to Jamaicans living with wound or chronic ulcers requiring wound care. The findings can be used to develop a knowledge base and influence a course of action aimed at advocating the importance of privacy during care and its relation to treatment compliance, management and prevention of complications due to non-compliance. The study describes one of the major psychological factors that may affect these individuals.

In addition the research can provide opportunities for organizations such as the ministry of health or other members of the health care system to implement strategies that can help improve compliance.

## Research Objectives

1. The research seeks to determine the extent of decreased privacy on patient education and compliance regarding wound care.
2. To note if making the area more conducive to privacy will increase patients' spirit of enquiry, compliance in care and comfort thus promoting wound healing.

## Research Design

A classic descriptive design was utilized using quantitative methods, to obtain more information about characteristics of the population under study (Burns & Grove, 2009). In this research, the variables described were maintaining privacy during wound care, and the demographic variables age and gender.

## Population and Setting

The study was conducted at a rural health center, a Type 3 health center providing primary health care to those within the Zone 4 area of the St. Catherine Health Department. The target population was the patients receiving wound dressing at the institution. The average enrolment for this population at the health center was thirty (30) (R. Burton, personal communication, October 30, 2012).

Inclusion criteria; all the patients seeking wound care who were 18 years or older attending the health center on the days of dressing, were asked to participate in

the study. Exclusion criteria; those that were absent on the days data was collected and below 18 years and those who refuse to participate.

## Sample size

The population of interest for this study is patients receiving wound dressing at the Bog Walk Health Center. The sampling frame was obtained from online sample size calculator software. Fairwarning, (2011), in their study to examine “Canada: How Privacy Considerations Drive Patient Decisions and Impact Patient Care Outcomes” utilized a confidence interval of 95% and a margin of error of 5%.

Similarly, from a total population of 30 patients receiving wound care in the Bog Walk Health Center, a confidence interval of 95% and a margin of error of 5% was utilized and a sample of 28 persons were generated from the online sample size calculator (Creative research system, 2012).

## Sampling Technique

The convenience sampling method was used in selecting participants within the study. Convenience sampling is a type of non-probability sampling which selects participants due to easy access and availability (Polit & Beck, 2012).

## Data Collection Instrument

A fourteen (14) item structured researcher developed questionnaire was used to collect data for this study (see Appendix 2). The instrument was divided into two (2) sections. Section 1 had demographic items and Section 2 relates to the research questions. Likert type questions were utilized, the equivalent weight of the answer to the questionnaire is as follows; yes or no and others agreed, disagreed and uncertain.

## Data Collection Procedures

Data collection was done by the researcher, a structured questionnaire was used as a guide to ensure uniformity and decrease bias. A letter requesting permission was delivered to the Parish Manager of the St. Catherine Health Department (STCHD) to utilize the Bog Walk Health Center (BWHC) as a site of research. Data collection began after approval from the St. Catherine Health Department. The

participants were informed about the purpose of the study, and the benefits and risks involved. After which a consent form was given to each participant indicating their willingness to participate. Privacy was maintained throughout the period of completing the questionnaires; responses were also kept strictly confidential. All participants were informed that their participation in the study was voluntary, that there would be no compensation and they had the right to withdraw at any time if they became uncomfortable with the process. Respondents were informed not to place their names on the questionnaire, so that their identity would not be disclosed. The researcher contact information was also provided, if the participants had any further queries.

A list of the population was obtained from the facility. Data was collected over a three (3) day period that is Monday, Wednesday and Friday which are the scheduled days for dressing per week. Initial contact will be made through recruitment on the day of scheduled dressing change. Permission for study participation and informed consent was done at that time. The patients were given 3-5 minutes to decide if they were willing to participate in the study.

## Data Analysis

Data was analyzed using the Statistical Packages for Social Sciences (SPSS) version 20, this software allows easy data entry and tallying. Data Analyses was represented using tables, simple percentages and graphical images. The open ended questions were coded manually to reveal regularity and patterns.

## Reliability and validity

Reliability describes how far a test or tool such as a questionnaire will produce similar results in different circumstances, but with all conditions being the same. Instrument reliability is the consistency to which it measures the construct or attributes, it was designed to measure (Polit & Beck, 2012). Ensuring instrument reliability for the perception of active ageing questionnaire will involve test- retest approach, by administering the instrument twice on persons of the same or similar characteristics and setting using 10% of the estimated sample.

Validity is the extent to which an instrument measures what it is supposed to measure and performs at it is designed to perform, and the degree to which an instrument measures what it is supposed to measure (Polit & Beck, 2012). The

instrument was given to an experienced quantitative researcher to critique and feedback from the expert's was used to review items. Pretest of 10% of the questionnaire was carried out at another Health Center. The pretest questionnaires was collected and reviewed. Any adjustments that needed to be made to the structure of the questionnaire instrument, for ease of completion was done.

## Ethical Consideration

Approval to conduct this study was sought through the Parish Manager of the St. Catherine Health Department (STCHD) to utilize the health centre as a site of research. Four ethical principles were used to guide the study. The principles of respect for persons, beneficence and justice, right to voluntary participation and the right to informed consent was demonstrated (Belmont Report as cited in OHRP, 2011).

The participants were informed about the purpose of the study, and the benefits and risks involved. After which a consent form was given to each participant indicating their willingness to participate. Privacy was maintained throughout the period of completing the questionnaires; responses were also kept strictly confidential. All participants were informed that their participation in the study was voluntary, that there would be no compensation and they had the right to withdraw at any time if they became uncomfortable with the process. Respondents were informed not to place their names on the questionnaire, so that their identity would not be disclosed. The researcher contact information was also provided, if the participants had any further queries.

## Results

### DEMOGRAPHIC DATA

For this research the population size consisted of thirty (30) patients and the calculated sample size was 28 patients. However nineteen (19) patients completed the questionnaires. Therefore a respondents' rate of 68 % was obtained. Of the 19 participants in the study 89 % (17) of the patients were male and 11 % (2) were female. Participants age ranged from 18 to 37 years and older. Majority of the participants were in the age range of 37years and older (see Table 1).

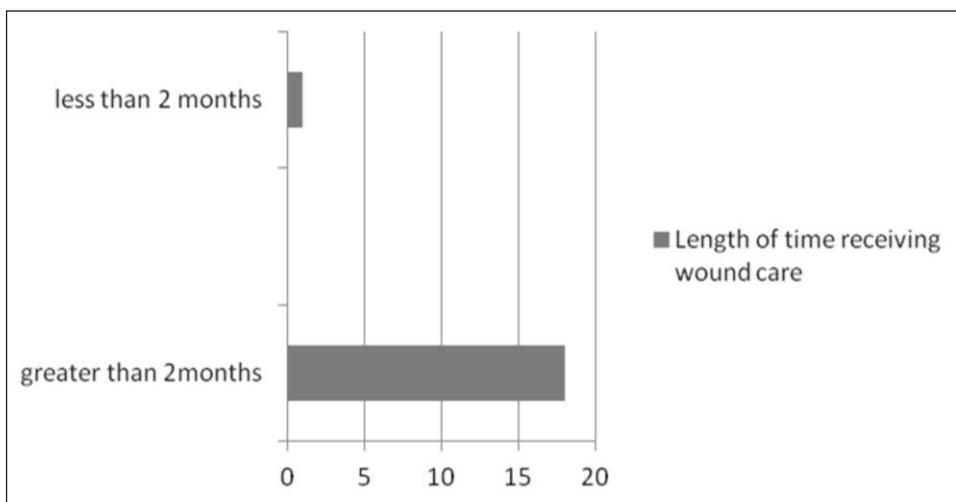
**Table 1:** Demographic Data (N=19)

Variables	N	%
<b>Gender</b>		
Male	17	89.4
Female	2	10.5
<b>Age Group (years)</b>		
18-24	2	10.5
25-30	0	0
31-36	1	5.2
37-over	16	84.2

*Objective 1: To determine the extent of decreased privacy on patient education and compliance regarding wound care.*

Majority of the respondents 68% (13) asked the staff performing the dressing change to hurry in completing their wound dressing, despite the fact that 32% (6) respondents noted that though they were uncomfortable with minimal privacy, they asked questions regarding home care, acknowledging the need for patient education.

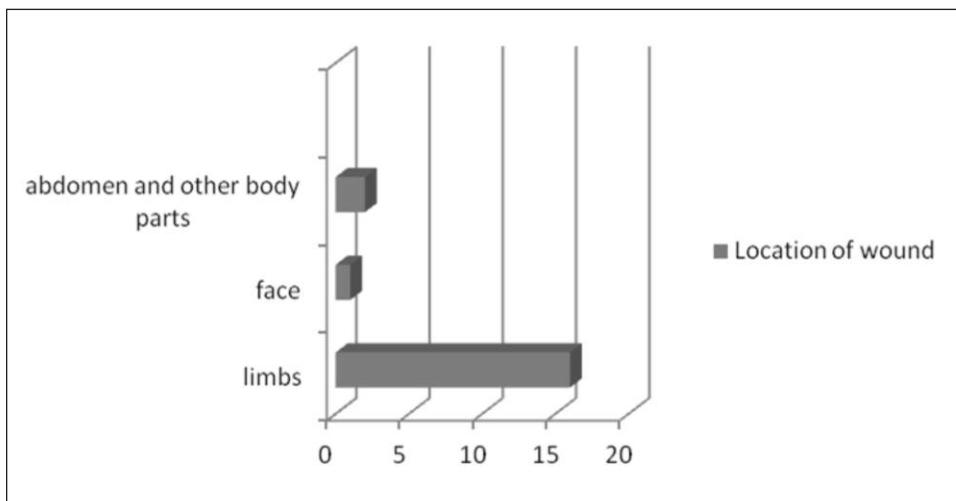
All the same 95% (18) were receiving wound care for a period greater than two (2) months, whereas 5% (1) has been receiving care less than 2 months. (See Figure 1).



**Figure 1.** Length of time receiving wound care

The areas of the body for dressings were 84% (16) had wound on the limbs (upper or lower extremities), 5% (1) had wound to the face, 11% (2), had wound to the abdomen and other areas. (See Figure 2).

89% (17) agrees that the trafficking through the wound care area during dressing period is unwelcomed and should stop, 11% (2) states it doesn't bother them. Correspondingly 95% (18) voiced that the wound care area needs improvement to privacy.



**Figure 2.** Location of wound

*Objective 2: To note if making the area more conducive to privacy will increase patients' spirit of enquiry, compliance in care and comfort thus promoting wound healing.*

In addition, the patients were asked to rate the privacy level in the wound care area at the Bog Walk Health Center 26% (5) patient gave a rating of poor, 16 % (3) patient said fair, 11% (2) patient said that the privacy setting of the wound care area is good. (See Figure 3).

While 89% (17) patient agreed that privacy will improve education in the wound care area, 11 % (2) disagreed. Of the participants 13 (68%) stated that they rarely asked questions or expressly interact with staff about the care of their wound, with the fear of being overheard by other patients, while 3(16%) responded that they asked questions related to their care regardless of bystanders or being overheard

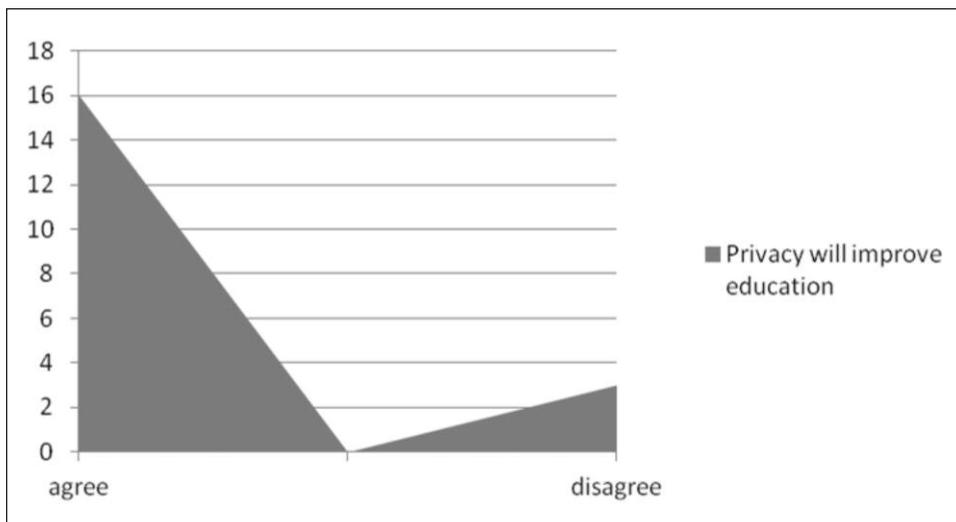


Figure 3. Privacy and education

and the remaining 3 (16 %) just didn't know what questions to ask but was afraid to look at the wound for too long.

## Discussion

Multiple factors can lead to impaired wound care and healing. These can be classified into local and systemic with many of these factors being related. In relation to the objectives of this research educational challenge due to infrastructural deficit that minimized privacy during wound care impacted on the local and systemic management of the wound care (Guo & Dipietro, 2010). Evident by majority of the respondents 68% (13) asking the staff performing the dressing change to hurry in completing their wound dressing. The wounds were located on different parts of the body and may require the removal of some clothing to enable dressing change alluding to the fact that privacy can be viewed in communication and physical.

The findings were made even stronger, as 89 % (17) expressively stated that privacy will definitely create the atmosphere of one to one care, allowing for more education or advice on the wound and possible ways to bring about healing in a reasonable time decreasing the discomfort experienced with others trafficking through the wound care area during dressing change. Inadvertently, education decreases the length of the time patients' need to visit the Health Center for wound

care as wound healing would be enhanced, through continued home care management (Alspaugh, 2012). Therefore it can be concluded that lack of privacy is a barrier to education.

Though disclosure and breach of patient information may not be intentional but can be blamed on the demanding, commonly overcrowded, care institutions which become less than perfect environments. Discussions with patients can effortlessly be overheard. Therefore constant, ongoing attempts can be implemented to minimize the odds of unintended exposure (Nass, Levit & Gostin, 2009). This supported the view that 95% (18) voiced that the wound care area needs improvement to privacy.

As patient education is important to allow for continuity of the care principles for outpatients which are expected to bring about improvement and maintenance of chronic conditions. Improvement in the facility to encourage the culture of questions and answer sessions is of dire importance as 13 (68%) stated that they rarely asked questions or expressly interact with staff about the care of their wound, with the fear of being overheard by other patients. Though the remaining percentage combined stated that they didn't care if there were bystanders and some didn't know what to ask, constant, one to one educational session could inadvertently address issues regarding care that may not have been thought of before then (Huisman, Morales, Van Hoof & Kort, 2012).

## Conclusion

The study has shown that the provision of privacy in patient care is important. It has magnified the fact that an open and intrusive environment in administering patient care hinders the patient's healing ability and therapy by preventing free and honest flow of communication. Communication enables questions to be asked, patient education on specific enquiries and possible return demonstration which leads to proper assessment, implementation and evaluation of patient care (Wound Institute, 2011). Following implementation of the privacy plan, more patients said they were encouraged by what was done which will increase honest response in communication creating a therapeutic environment. Therefore it is recommended that all institutions providing patient care should make sure the necessary steps are taken to provide environmental and information privacy which improves the standard of care given by staff and received by patients.

## Limitation of the Study

Some of the questions may have been ambiguous; therefore some respondents had some challenges in answering.

The study was done at only one health center in the St. Catherine Health Department, hence this did not allow for generalization beyond this area of care.

## Recommendations

1. Encourage the staff to provide private areas for wound dressing to motivate patients in asking questions and for individualized teaching moments re care.
2. Place emphasis on the need for knowledge as it relates to the institution's policies that encourage maintaining privacy and confidentiality
3. Erect sign/charts to remind "waiting" patients and other staff member when the dressing area is occupied in between wound care to prevent walking through area while care is being administered.

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# Non-Utilization of the Nursing Process to Manage Mental Illness by Registered Nurses in a Mental Hospital

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## Abstract

*The Research Problem Statement was the “Non-utilization of the nursing process to manage mental illness by Registered Nurses in a mental hospital”. The significance of the study was to motivate Registered Nurses on the acute wards of the hospital to always and effectively utilize the nursing process in the management of the mentally ill patients, in order to improve quality of life, therapeutic relationship, prevent relapse and prolonged hospitalization, and to improve the standard of practice.*

*The qualitative design utilizing the survey method was used to collect data by the researchers with the use of a questionnaire and a standard audit tool. The population was Registered Nurses (24) working full time and the docket of patients (76) on the acute wards of the hospital. A nurse-patient ratio of 1:3 was used for data collection. A convenient sampling method was used.*

*The key findings, analysis and interpretation of the findings and conclusion explored the perspectives of nurses in utilizing the nursing process to manage the mentally ill patients. The nursing process is an interactive, analytical process using an organized and individualized way to accomplish outcomes of nursing care, respects the individual's autonomy, freedom to make decisions, be actively involved in nursing care and used as the standard for providing quality care to meet client's needs. However, there are factors that influenced the non-utilization of the nursing process. Findings from the research study revealed that excess workload and shortage of staff were the two (2) major contributing factors why Registered nurses (RN) did not utilize the nursing process.*

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*Although there were positive benefits that can be derived from utilizing the nursing process in caring for the psychiatric patients, its non-utilization and partial utilization presented unique challenges in achieving optimal outcome to care given. In addition, the research highlighted that Registered Nurses had good theoretical knowledge of the steps used in the nursing process but failed to incorporate all the steps in the management of the mentally ill. The hospital management should employ more nurses for a standard nurse to patient ratio (1:4) to reduce work load thus facilitating the use and documentation of the nursing process.*

**Keywords:** Nursing process, Nurse, Mental illness, Hospital

## Introduction

### BACKGROUND OF STUDY

The hospital in this study is a specialist hospital established in the 19th century. It was designed as a large psychiatric hospital and established to provide care for the mentally ill clients. The services offered at the hospital are: Acute psychiatric emergencies, rehabilitative and re-integrative services, sub-acute psychiatric services, psychological services, psychiatric medical board, forensic psychiatric evaluation, dental services, social work, pharmaceutical, dietetics and nutrition services. Its patient population was 775 as at April 2016 and there are presently 23 wards. The hospital is divided into acute, sub-acute, psycho-medical, intellectual disability, long stay, psycho-geriatric and rehabilitative wards (Bellevue Hospital, In-service Educational Unit, 2016).

The three (3) acute wards (56 males and 20 females) are the only admitting wards at the hospital. The current nursing cadre for level two posts is 145 at present and there are 73 nurses under filling those posts. This number includes trained and untrained psychiatric nurses. However, some group members' randomly audited fifty (50) patient's dockets on the male acute wards showed absolutely no utilization of the nursing process by Registered Nurses in the management of the mentally-ill patients. The findings were over the six-month period, between August 2014 and January, 2015 (Bellevue Hospital, In-service Educational Unit, 2016).

Nursing process was defined by Farlex (2012) as a structured, organized, and systematic approach to developing and delivering patient care including assessment,

diagnosis, outcome identification, planning, implementation, and evaluation, in order to meet patients' needs and promote better health.

## PURPOSE OF STUDY

- (1) The study explored the perspectives of registered nurses in utilizing the nursing process in the management of the mentally ill patients.
- (2) The study also explored the contributing factors that led to Registered Nurse's non utilization of the nursing process in the management of the mentally ill patients.

### *Sub-topics or research questions*

The study sought to answer the following questions.

- (1) What are the perspectives of Registered Nurses on the acute wards of the hospital in utilizing the nursing process in the management of the mentally ill patients?
- (2) What are the roles of the level of education of Registered Nurses on the acute wards at the hospital in utilizing the nursing process in the management of the mentally ill patients?
- (3) What are the factors contributing to lack of utilization of the nursing process in the management of the mentally ill patients?
- (4) What measures are used to improve patient's quality of care on the acute wards at the hospital?

## METHODOLOGY:

### *Research Design*

The study utilized the qualitative design. A Survey method was used to collect the data by researchers with the use of a questionnaire that elicited the Registered Nurses' attitudes, beliefs and opinions.

### *Population*

The population was Registered Nurses working full time on the acute wards and the dockets of patients on the acute wards of the hospital.

### *Inclusion Criteria*

All Registered nurses working on the acute psychiatric wards on various shifts. The acute wards were chosen as only Registered Nurses worked on those wards.

### *Exclusion Criteria*

All other categories of Nurses and other wards including: sub-acute and chronic wards were excluded from participating in the study.

### *Sample*

The acute ward consisted of twenty-four (24) Registered Nurses and seventy-six (76) in-patients. A nurse-patient ratio of 1:3 was used for data collection with twenty-three (23) nurses selected.

### *Sampling Method*

Ethical approval from University of Technology, Jamaica, Ministry of Health, and Bellevue Hospital was gained. A consent form was then issued to Registered Nurses (Appendix 1) who participated in the study with the use of their initials. Data were collected from inpatients dockets using Audit Checklist (Appendix 3) on the male and female acute wards and questionnaires consisted of sixteen (16): one (1) open-ended, fourteen (14) closed and one (1) Likert-type scale questions. The questionnaire was administered to Registered Nurses working on the stated wards and was completed between 10-15 minutes.

The hospital was chosen because it is the only psychiatric hospital and it provides care and services exclusively to mentally ill clients. Also centrally located with a wide cross-section of patients received nursing care from across Jamaica and the Caribbean.

### *Sample Selection*

There are three (3) acute wards at the hospital. The numbers of patients on the wards are as follows: ward K1 (female ward) was twenty (20), ward K2 (male) twenty-six (26) and K3 (male) thirty (30). The overall total number of patients was seventy-six (76). The total number of Registered Nurses working on the acute wards was twenty-four (24). Using the Raosoft sample size calculator, with a confidence level of 95% and a margin of error of 5%, the sample size of sixty four (64) dockets was used and a sample size of twenty (23) Registered Nurses were selected using the convenience sampling method.

### *Data Analysis and Presentation*

The data was analyzed using the Statistical Package for Social Science (SPSS) programme version twenty (21) that identified the associations and relationships between Registered Nurses and the non-utilization of the nursing process to manage mental illness. Findings were presented in the form of tables, graphs and pie charts.

### *Data Collection Instrument*

The instruments used were a questionnaire consisting of sixteen (16) open-ended, close-ended and Likert-type scale questions (Appendix 2) and Audit Checklist of the patient's docket (see Appendix 3). The charge Nurses were contacted to identify the most suitable days between Tuesday and Thursday for data collection. The researchers were present to hand out and collect the questionnaires; and the patient's dockets were audited using the checklist (A search of the docket identified if the steps of the nursing process had been used) over a one-week period. The questionnaire was self-administered to Registered Nurses to be completed between 10–15 minutes.

### *Reliability and Validity*

Reliability and Validity would be achieved by pretesting the instrument with Registered Nurses previously assigned to the acute wards and have been reassigned. However due to time constraints the pre-test of the questionnaires was not done. The patients' dockets were audited with the use of the checklist (see Appendix 3), after permission was ascertained from the Senior Medical Officer (SMO) (see Appendix 6) and the Director of Nursing Services.

### *Delimitations*

- Theoretical Perspective: Orlando's Nursing Theory was chosen as the theory postulated directly to the nursing process.
- Research Topic: All researchers work at the institution and observed the limited use of the nursing process in caring for the mentally ill client.
- Population: Registered Nurses were selected as they are trained to utilize the nursing process in caring for clients.

- Case Study: Small study selected due to number of researchers. Mental health is the researcher's area of expertise.
- Hospital: Hospital was chosen as all researchers currently work there. Hospital was also chosen due to the wide cross-section of patients and staff from different cultural background present.
- Small study: Findings cannot be generalized.

## ETHICAL CONSIDERATIONS

Approval was sought from the Ethics Committee of the University of Technology Jamaica/ Excelsior Community College, the Bellevue Hospital Chief Executive Officer, and The Ministry of Health. Registered Nurses were informed of the study and allowed time to consider their decision to participate; subsequently a consent form was signed indicating their willingness to participate.

Anonymity was maintained throughout this study with the use of initials of Registered Nurses to maintain confidentiality. A blank questionnaire was placed in an unmarked envelope and given to Registered Nurses to be completed and after completion placed in the same unmarked envelope and put in a drop box in a central location, then returned to the researchers. The questionnaires in the unmarked envelope was placed in a drawer with lock and key only accessible to the researchers and supervisors and will be discarded after six (6) months by shredding. Participants were informed that there was no penalty for refusing to participate in the research study and to complete the questionnaire; they were not coerced to participate in the study.

## Results and Analysis

### PATIENTS' DOCKETS AUDIT

The auditing of 64 patients' dockets consisted of 5 elements. Among the 5 elements, element (1) psychological history had 8 variables. Of the 8 variables, age, sex accounted for 64 (100%) documentation in the docket. While living accommodation, number of children, education and occupation accounted for 33–38 (52–59%) of the documented information. On the other hand, the history of family health, past health history, chief complaint and history of present illness had a documentation rate of 42–62 (66–97%).

**Table 1:** The Elements noted in the patient record

Elements	(N)/Percentage (Yes)
I. Psychosocial History	64 (100%)
Age	64 (100%)
Sex	64 (100%)
Marital status	50 (78%)
Religious affiliation	41 (64%)
Occupation	38 (59%)
Education Level	35 (54%)
Number of children	33 (52%)
Living accommodations	33 (52%)
II. History of Present Illness	62 (97%)
III. Chief Complaint	61 (95%)
IV. Past Health History	55 (86%)
V. Family Health History	42 (66%)

Physical Assessment of the clients was documented in 57 (89%) dockets. Dockets audited on the type of documentation done revealed Head to toe as the most common with 55 (86%). Apart from the nursing assessment which included the mental status examination, the other stages of the nursing process are Diagnosis, outcome identification, planning, implementation, evaluation and follow-up care.

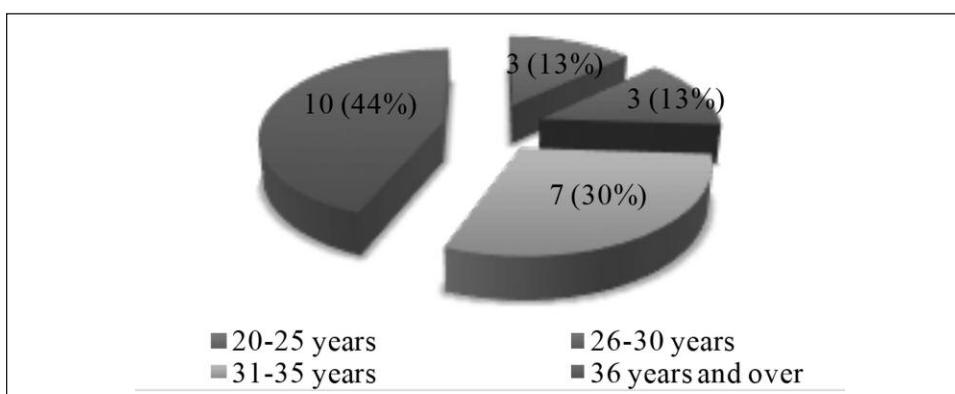
Dockets audited on the Theoretical Framework for the documentation of the nursing process, revealed that 64 (100%) of the dockets had none of the seven (7) elements (assessment, nursing problem, risk diagnosis, actual diagnosis, goals, interventions and outcome) that made up the model.

Section C of the instrument, addressed meeting requirements for data entry. All nurses 64 (100%) established that the writing record was legible and errors were properly corrected. In 64 (100%) of dockets the documentation completed were all timed and dated. The nurses also signed with the name of designation of the recording nurse 60 (94%). On the other hand, only 5 dockets (8%) had names printed on the documents. Findings revealed that 64 (100%) of the dockets audited had no evidence of discharge planning within 24 hours of admission and patient/family teaching within 72 hours of admission.

## Findings from the Completed Questionnaires by Registered Nurses

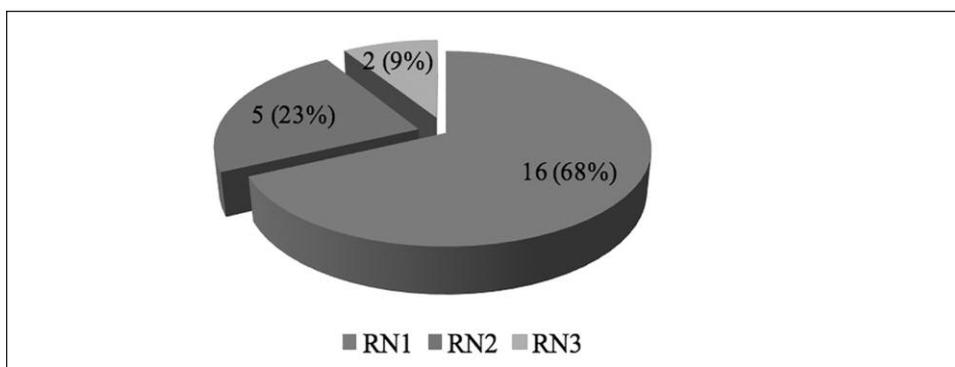
### DEMOGRAPHIC INFORMATION OF RESPONDENTS

The 23 (100%) participants (Registered Nurses) that participated in the study were between ages 20 to 36 years and over. As shown in Figure 1 below, the majority of the nurses 10 (44%) were 36 years and over. They were followed by 7 (30%) of nurses between the ages of 31 to 35 years. Three (13%) of the respondents were between the ages of 20 to 25 years and three (13%) of the respondents were between the ages of 26 to 30 years.



**Figure 1.** Age range of participants

Figure 2 below shows that 16 (68%) of the nurses were found to be in the Level 1 category of Registered Nurses. Level 2 Registered Nurses in the study represented 5 (23%). The remaining 2 (9%) accounted for Level 3 Registered Nurses.



**Figure 2.** Levels of Registered Nurse

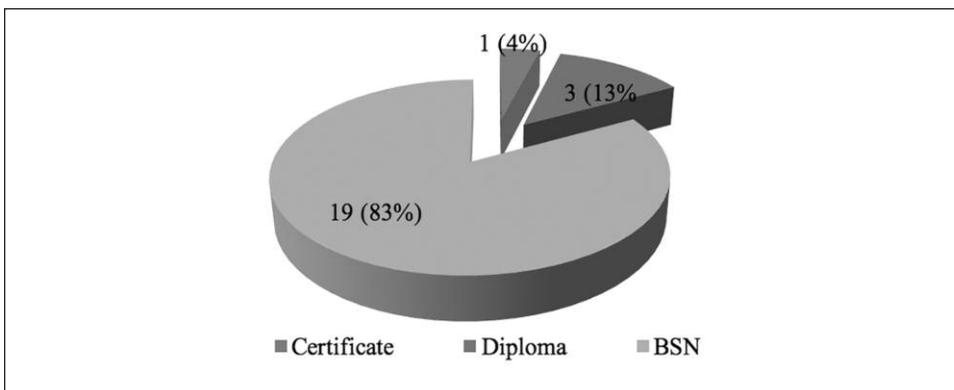


Figure 3. Academic qualification

The chart above shows (Figure 3) that 19 (83%) of the nurses had completed their BSc. in Nursing. Diploma and Certificate followed with 3 (13%) have a diploma and 1 (4%) has a certificate.

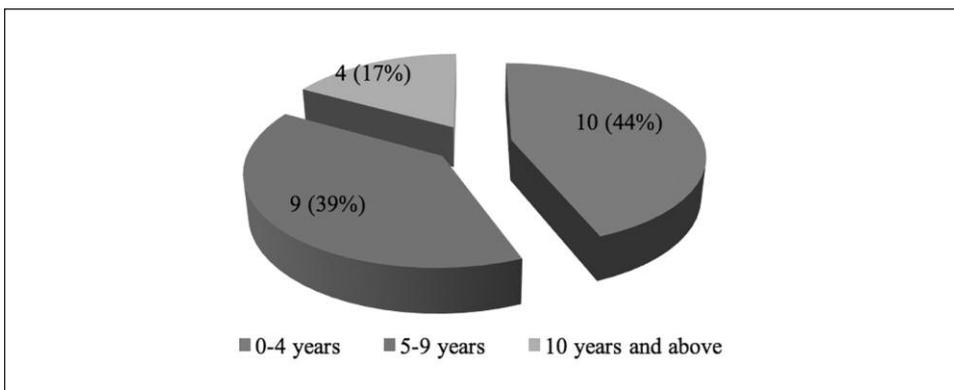


Figure 4. Nursing Experience

## REGISTERED NURSES UTILIZATION OF THE NURSING PROCESS

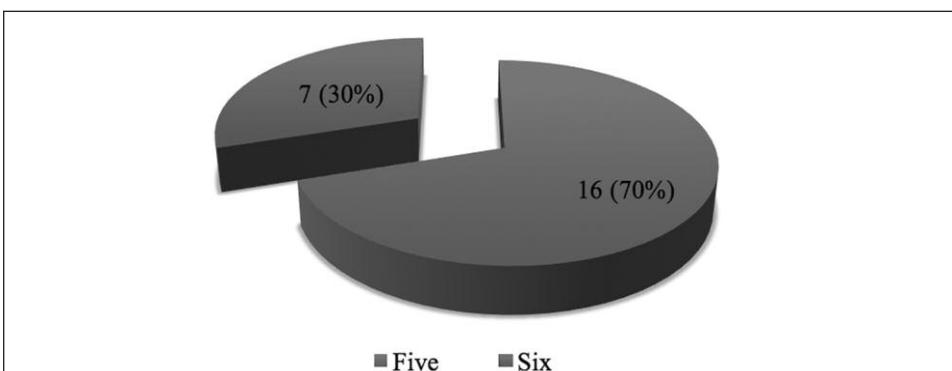
Among the causes regarding nurses perspective on the factors that prevented the nurses from utilizing the nursing process as shown in Table 2 below, 22 (96%) agreed that the shortage of staff was the major cause for not utilizing the nursing process. However, 23 (100%) of the nurses agreed that excess workload was the major cause for non utilization.

**Table 2.** The Perspectives of Registered Nurses in Utilizing the Nursing Process

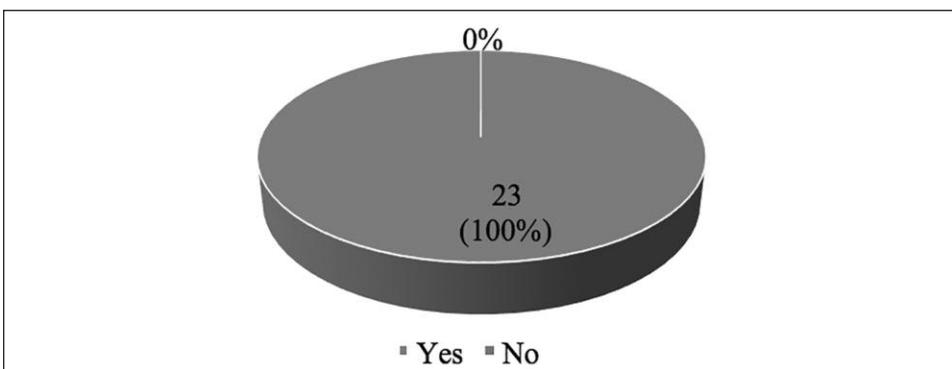
	Strongly Agree (N)	Agree (N)	Disagree (N)	Strongly Disagree (N)	No Opinion (N)	Total
Shortage of staff	18 (78%)	4 (18%)	1 (4%)	0	0	100
Excess workload	20 (87%)	3 (13%)	0	0	0	100
Lack of time	12 (52%)	8 (35%)	3 (13%)	0	0	100

Sixteen (70%) of the nurses identified the nursing process to be comprised of five steps, while 7 (30%) stated that there were six steps (Figure 5).

Registered Nurses' are knowledgeable of the nursing process. All 23 (100%) nurses agreed to this (Figure 6).



**Figure 5.** Steps in the Nursing Process



**Figure 6.** Nurses knowledge of the nursing process

Majority of the nurses 21 (91%) indicated that they used and documented the nursing process daily while 2 (9%) did not as shown in Figure 7.

Figure 8 showed that 22 (96%) of the respondents agreed that the nursing process was used as a tool to manage the mentally ill.

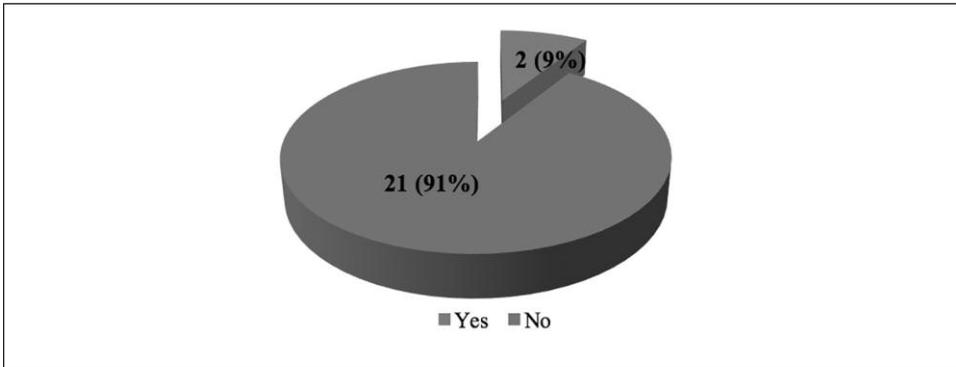


Figure 7. Daily usage and documentation of the nursing process

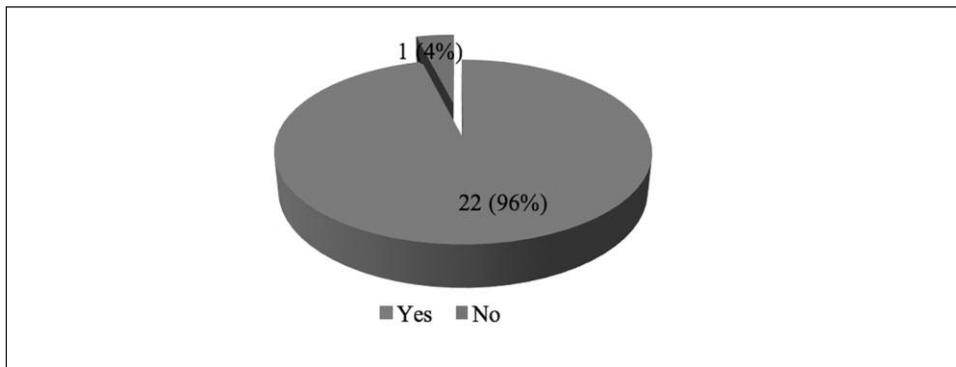
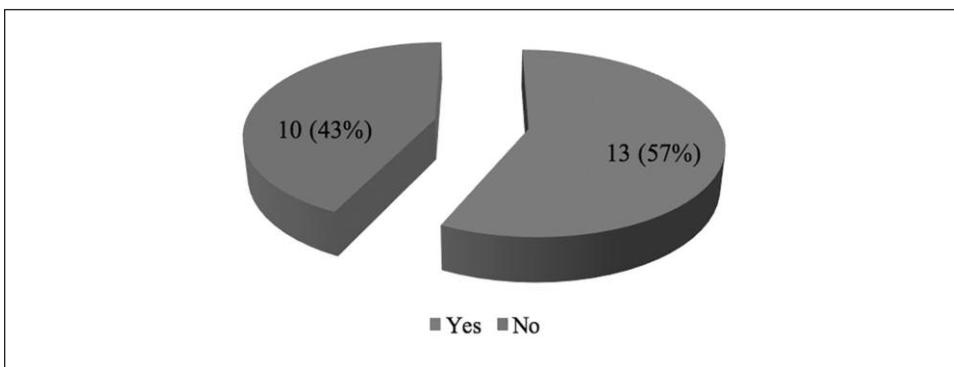


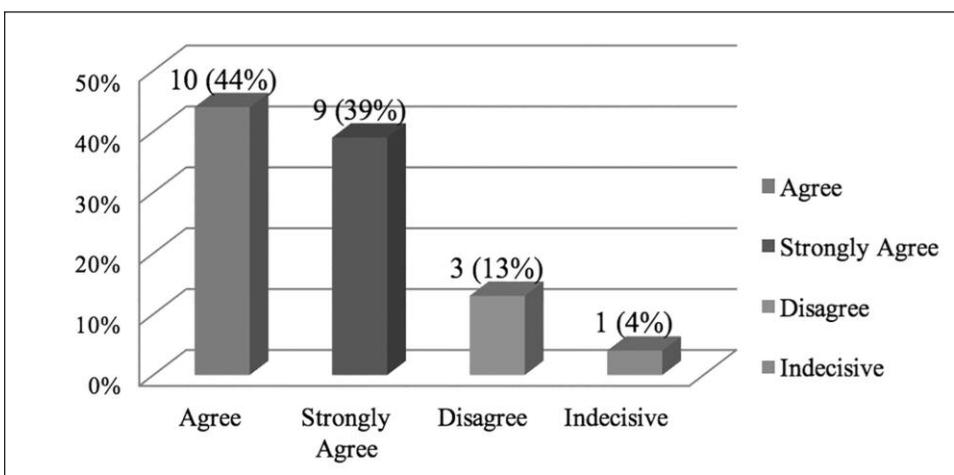
Figure 8. Managing the mentally ill using the nursing process

Nurse to patient ratio influenced the proper implementation of the Nursing Process as majority of the respondents 13 (57%) agreed while 10 (43%) disagreed. (Figure 9).

Figure 10 illustrated that 19 (83%) of the nurses agreed that Registered Nurses should indeed upgrade their knowledge of the nursing process. However, 3 (13%) disagreed and the remaining 1 (4%) was indecisive.



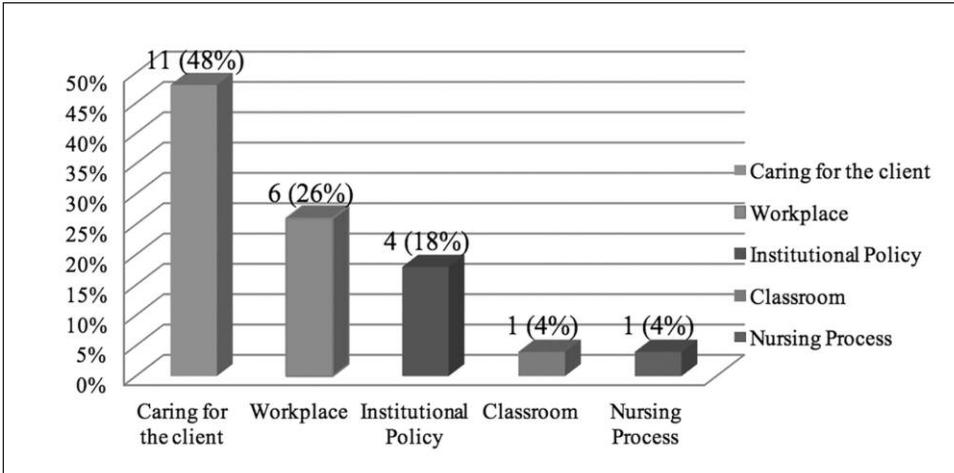
**Figure 9.** Nurse to patient ratio influence on proper implementation of the nursing process.



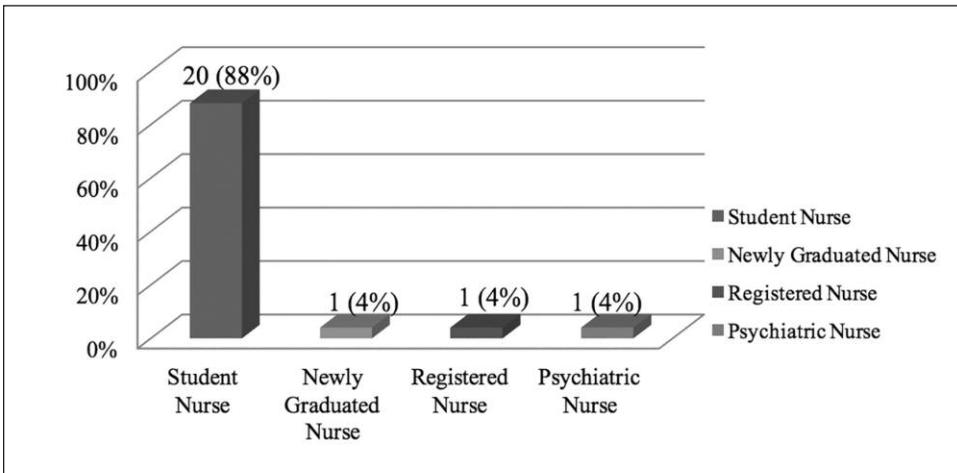
**Figure 10.** Registered Nurses knowledge of the nursing process

Of the five factors as shown in Figure 11, 11 (48%) of the nurses stated that caring for clients was the major one that influenced the nurses' attitude towards the use of the Nursing Process. The workplace and institutional policies followed with 6 (26%) and 4 (18%) of the respondents respectively. The classroom and Nursing Process were the least factor which accounted for 1 (4%) respectively.

The majority of the nurses 20 (88%) believed that student nurses mainly utilized the nursing process. Newly graduated, Registered Nurses and Psychiatric nurses also accounted for 1 (4%) each (Figure 12).



**Figure 11.** Factors that influence the nurses' attitude towards the use of the nursing process



**Figure 12.** Utilization of the Nursing Process

When asked about Nurses' attitude towards the nursing process, 9 (39%) of the nurses were neutral on the subject while a similar percentage of nurses believed that nurses had a generally poor attitude. The remaining 5 (22%) believed their attitude was good. (Figure 13).

Figure 14 illustrated that 23 (100%) nurses surveyed were in agreement that the nursing process had a positive effect on patient care.

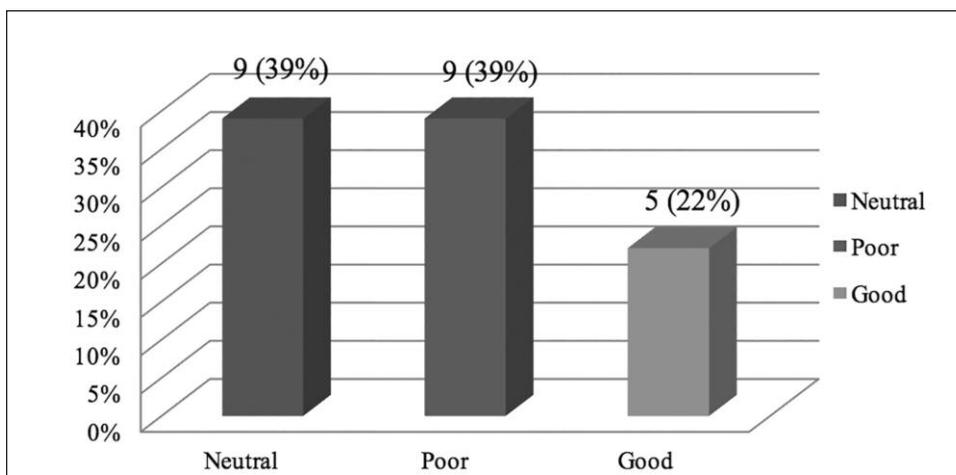


Figure 13. Nurses' attitude towards utilizing the nursing process

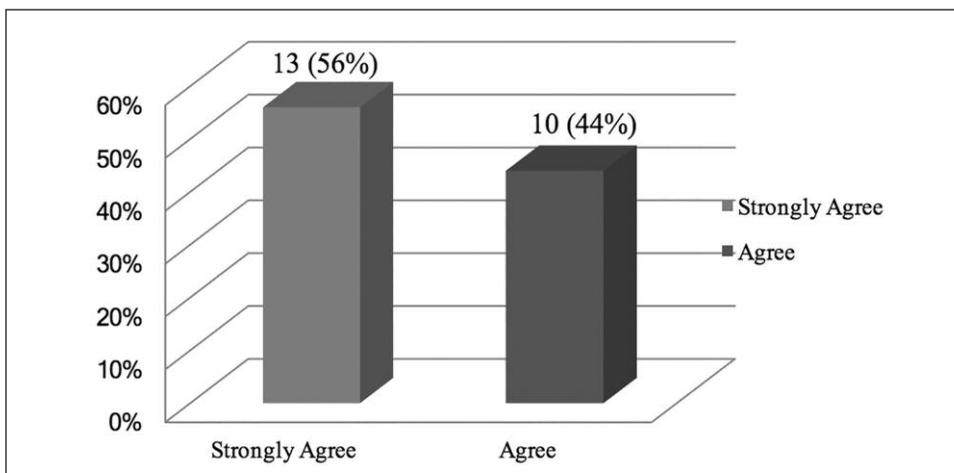


Figure 14. Nursing process effect on patient care

#### MEASURES USED TO IMPROVE THE USE OF THE NURSING PROCESS IN MANAGING THE MENTALLY ILL

The nurses identified several measures to improve the nursing process in managing the mentally ill, but the most popular factor was adequate staffing which represented 16 (70%). In addition, integrated institution policy, ongoing seminars to reinforce the knowledge of the nursing process and making the documentation

process much easier by creating a form, accounted for 4 (17%) of the respondents. Implementing the use of the nursing process and low nurse to patient ratio was stated by 3 (13%) of the nurses. Other measures stated by nurses were: teamwork of nurses, doctors, psychiatric aids and patient care assistants; and implementing the use of a checklist to replace writing accounted for 2 (9%). The least number of respondents 1 (4%) stated that computerization of the nursing process resulted in more time for hands on care, re-sensitization of the staff by the in-service department, ongoing research and staff training, time management of staff and supply adequate resources.

*Relationship tables*

How many years of nursing experience do you have? Do you use and document the nursing process on a daily basis?

**Table 3:** The Relationship between years of nursing experience and utilization of the Nursing process

		Do you use and document the nursing process on a daily basis	
		Yes	No
How many years of nursing experience do you have?	0-4 years	5%	41%
	5-9 years	5%	36%
	10 and above	0	13%

The table 3 above shows that years of experience does not ensure the use and documentation of the nursing process on a daily basis as the majority of nurses regardless of their years of experience do not use nor document the process daily. Hence there was no relationship between years of experience and usage and documentation of the nursing process.

What is your last Academic qualification in nursing? \* Do you use and document the nursing process on a daily basis?

**Table 4:**

		Do you use and document the nursing process on a daily basis	
		Yes	No
What is your last Academic qualification in nursing?	Certificate	0	0
	Diploma	0	14%
	BSN	9%	77%

Table 4 above showed that academic qualification does not guarantee the use and documentation of the nursing process and most of the nurses surveyed revealed that they do not use and document the nursing process daily although they have been taught otherwise during the course of their studies. Hence there was no relationship between academic qualification and usage and documentation of the nursing process.

## Findings From The Checklist

### SECTION A – COMPLETENESS OF NURSING HISTORY AND NURSING ASSESSMENT

Figure 1 showed that 44 (69%) of the docketts audited reflected that the client’s nursing history was documented on admission.

The element that was recorded by all nurses 64 (100%) as seen in Figure 1a was the Psychological history. This was followed by the history of present illness 62 (97%) and Chief complaint 61 (95%), past health history 55 (86%) and Family health history 42 (66%)

The audited docketts indicated that nurses all documented the psychosocial history of the clients as shown in Figure 1b. Of this, are sex and age information which were written by every nurse. Marital status and Religious affiliation follow with 50

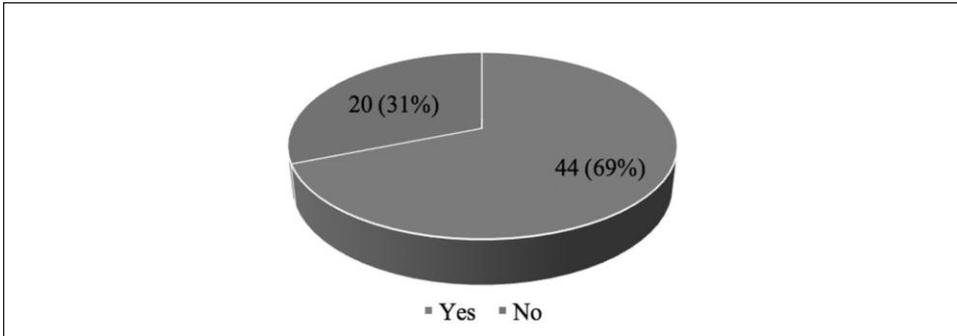


Figure 1. Client's nursing history

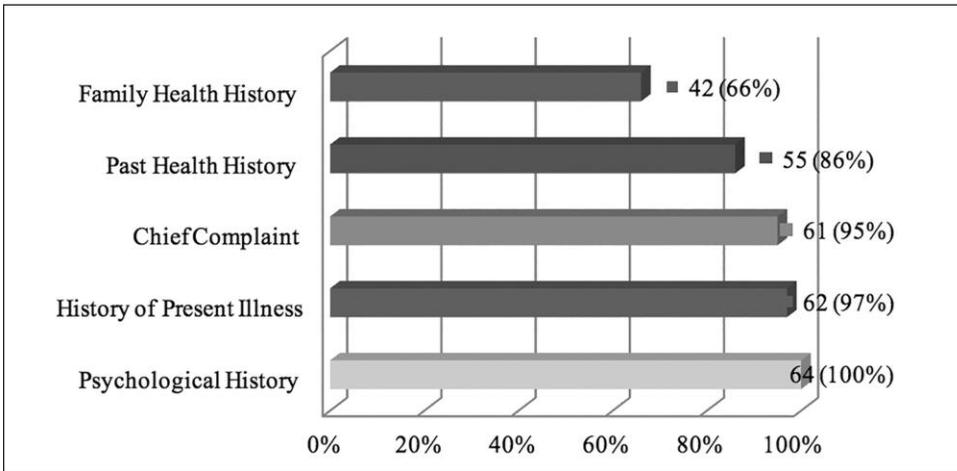


Figure 1a. Elements noted in the patient record

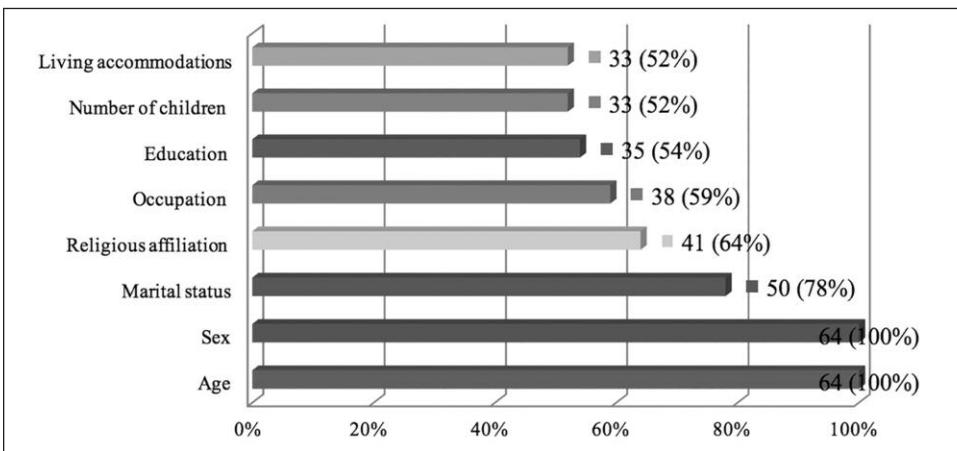


Figure 1b. Psychosocial History elements

(78%) and 41(64%) respectively. The remaining elements were collected by at least (50%) of the nurses.

Figure 2 showed that Physical Assessment was documented by 57 (89%) of the nurses.

The main type of documentation done was head to toe assessment which was documented by 55 (86%) of the docket audited as seen in Figure 3.

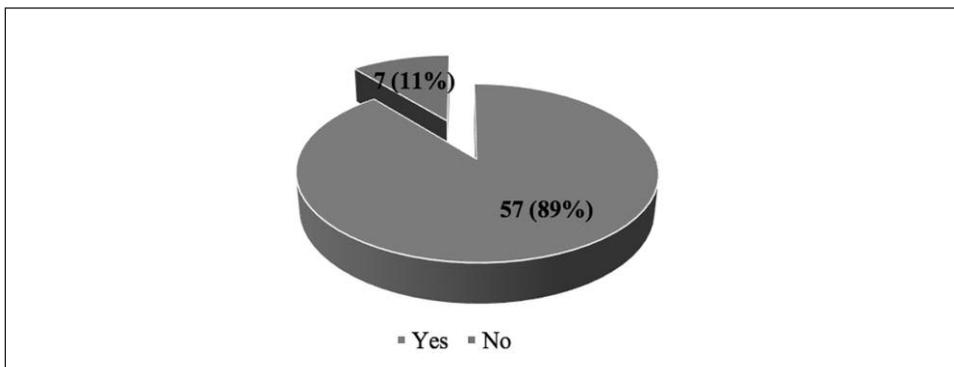


Figure 2. Physical Assessment documented

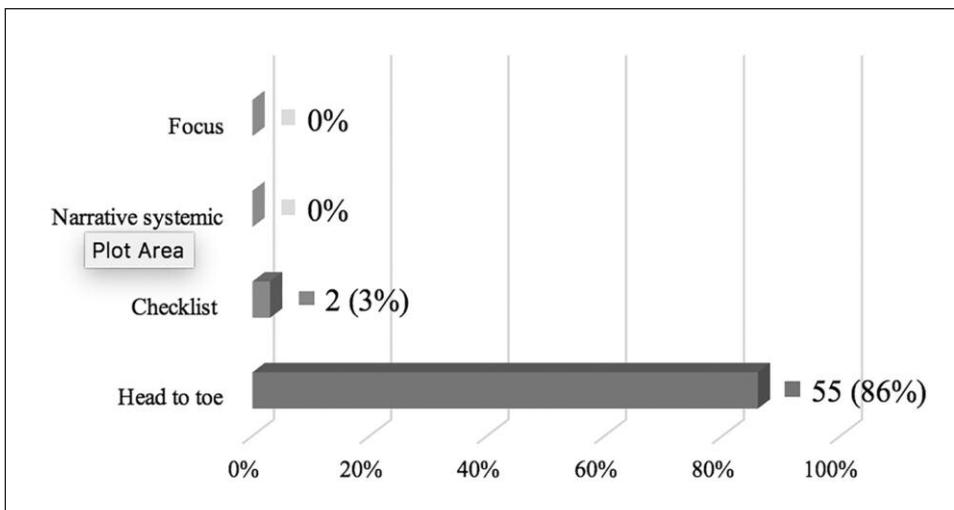


Figure 3. Type of documentation

### Breakdown of Documentation Elements

Figure 3a illustrated that 62 (97%) of the docketts audited did not show documentation of the Checklist.

Narrative systemic assessment was not documented in 64 (100%) of the docketts audited as seen in Figure 3b.

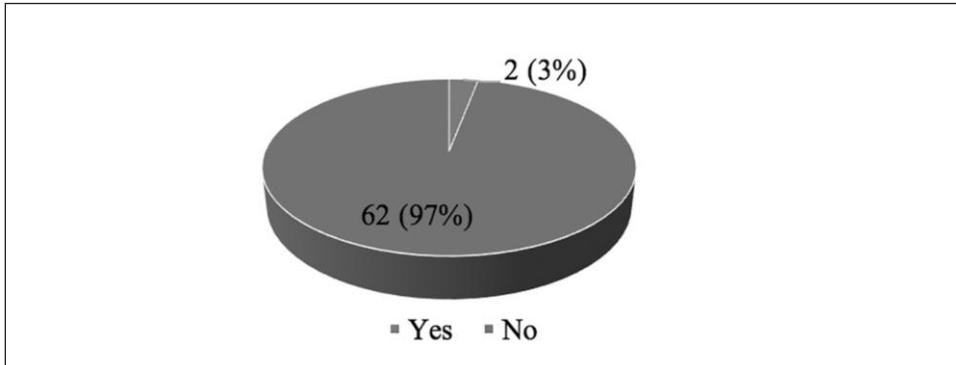


Figure 3a. Checklist

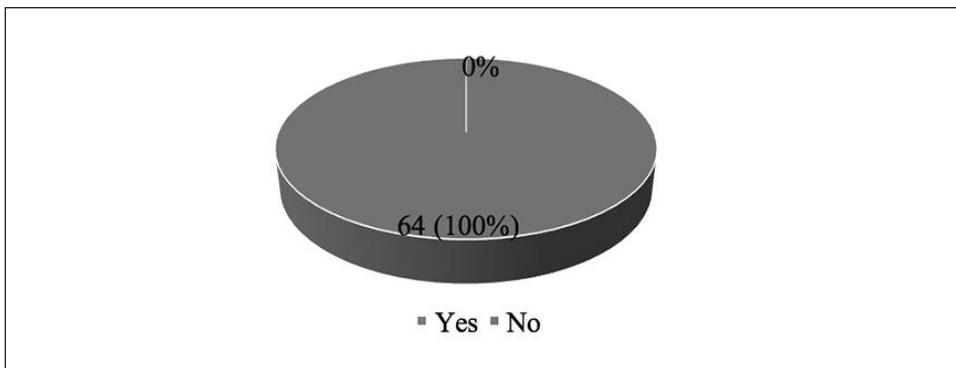
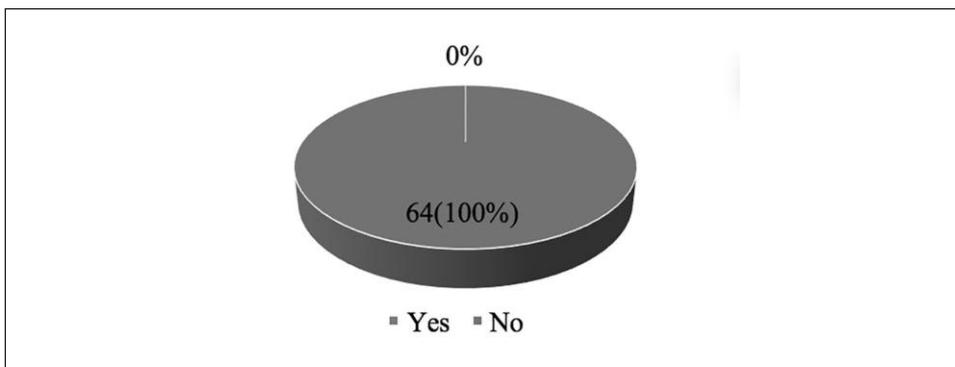


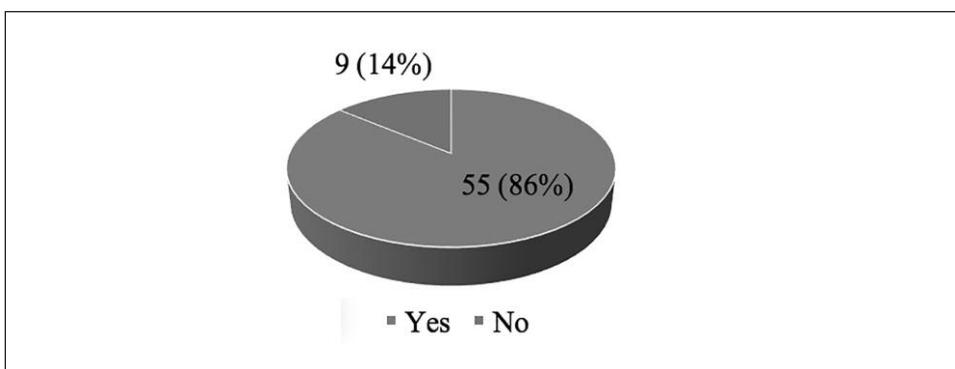
Figure 3b. Narrative Systemic Assessment

Figure 3c showed that 64 (100%) did not document using Focus assessment.

Head to toe assessment was seen documented by 55 (86%) of the nurses as seen in Figure 3d.



**Figure 3c.** Focus Assessment



**Figure 3d.** Head to toe Assessment

## SECTION B – THEORETICAL MODEL/Framework-SOAPIE/ DOCUMENTATION OF NURSING PROCESS

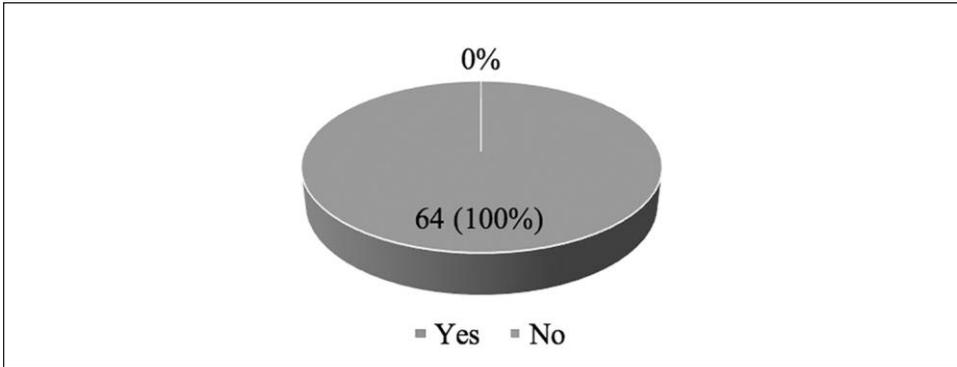
Of the 64 (100%) docketts audited, none of the nurses completed assessments forms using the SOAPIE method. (Figure 4).

Of the 64 (100%) docketts audited, none of the nurses identified the Nursing problem(s)/risk(s). (Figure 5).

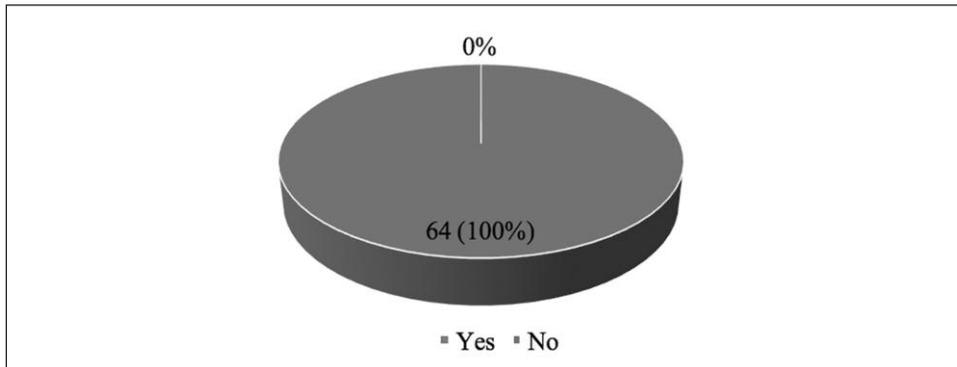
Of the 64 (100%) docketts audited, none of the nurses identified the Risk diagnosis containing two parts. (Figure 6).

Of the 64 (100%) docketts audited, none of the nurses documented the Nursing diagnosis containing three parts. (Figure 7).

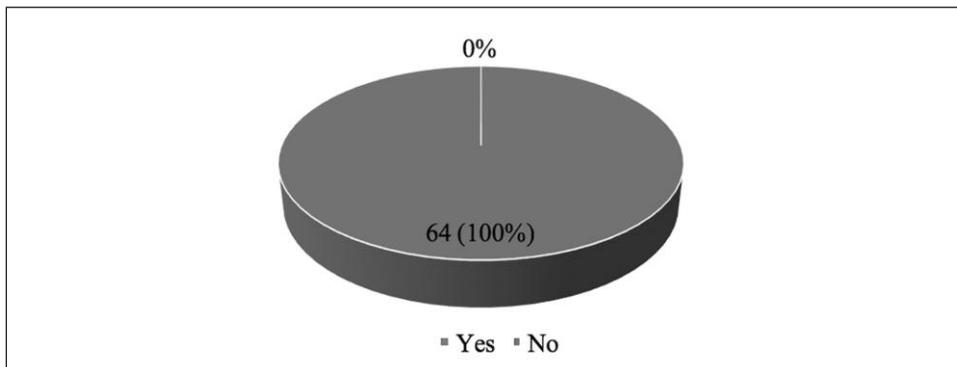
Of the 64 (100%) docketts audited, none of the nurses documented the stated goals. (Figure 8).



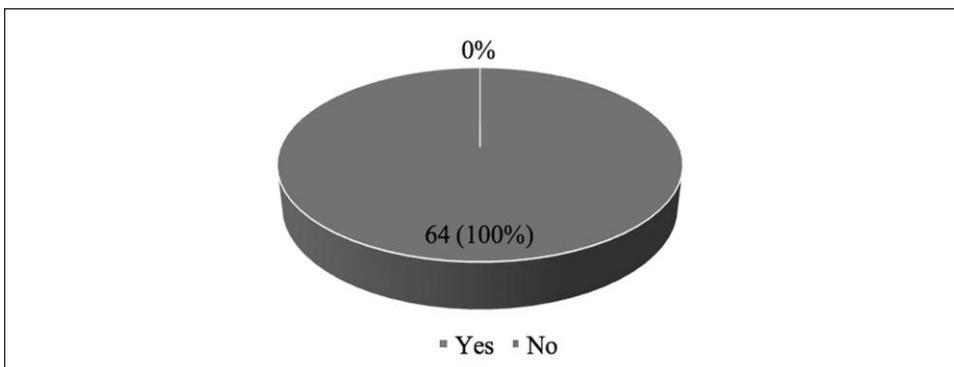
**Figure 4.** Client's daily assessment form completed using the SOAPIE method



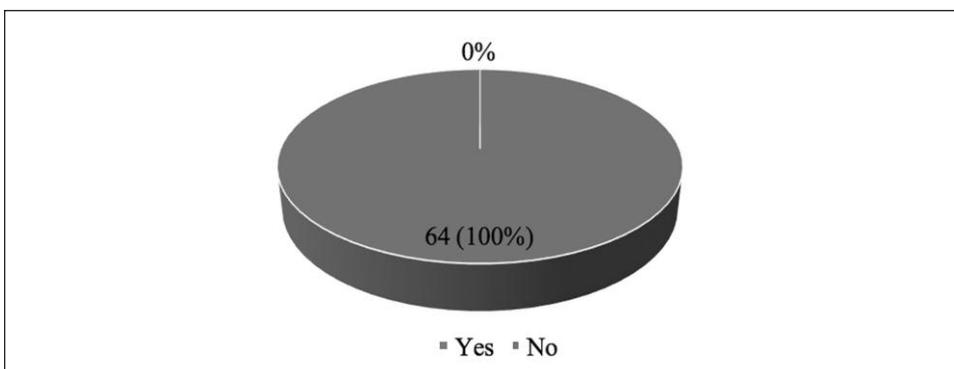
**Figure 5.** Nursing problem(s)/risk(s)



**Figure 6.** Risk diagnosis



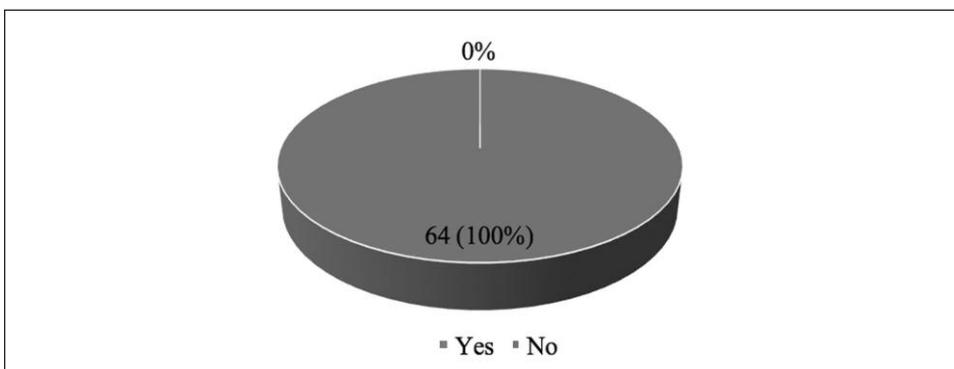
**Figure 7.** Actual diagnosis



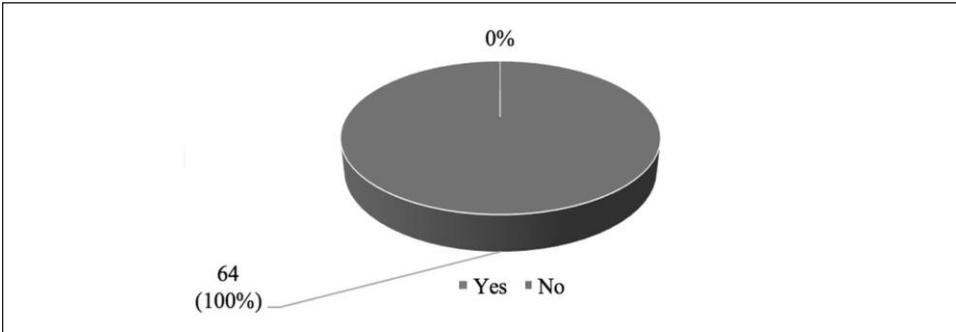
**Figure 8.** Stated goal

Of the 64 (100%) docket(s) audited, none of the nurses recorded implemented interventions. (Figure 9).

The client outcomes was not documented in 64 (100%) of the docket(s) audited in relation to each intervention recorded. (Figure 10).



**Figure 9.** Implemented intervention(s) recorded

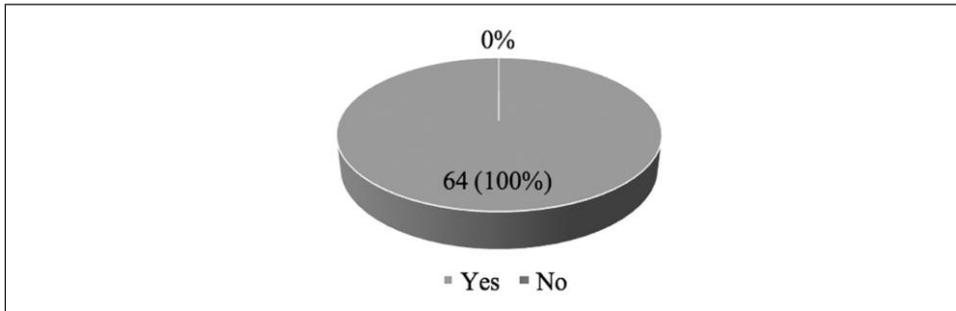


**Figure 10.** Client outcome(s) in relation to each intervention recorded

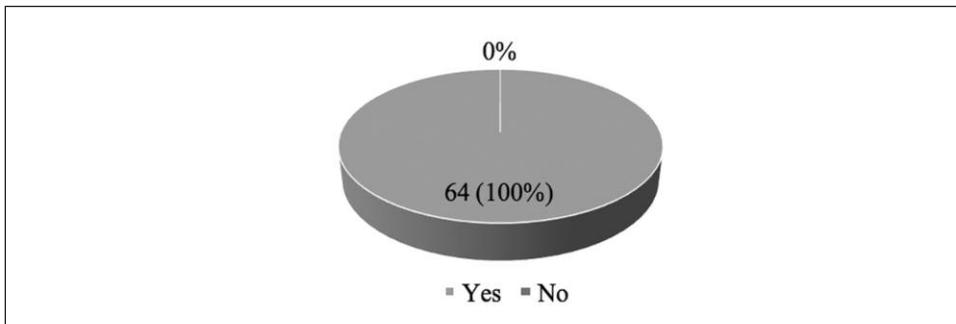
### SECTION C – MEETING REQUIREMENTS FOR DATA ENTRY

Of the 64 (100%) docket(s) audited, all of the nurses writing record were legible. (Figure 11).

Of the 64 (100%) docket(s) audited, all of the nurses properly corrected errors. (Figure 12).



**Figure 11.** Legibility of writing record



**Figure 12.** Correction of Errors

All 64 (100%) documentation were dated and timed, 62 (97%) were signed, the name and designation of the recording nurse 60 (94%) while 5 (8%) had printed name (Figure 13).

Of the 64 (100%) docketts audited there was no evidence of discharge planning within 24 hours of admission. (Figure 14).

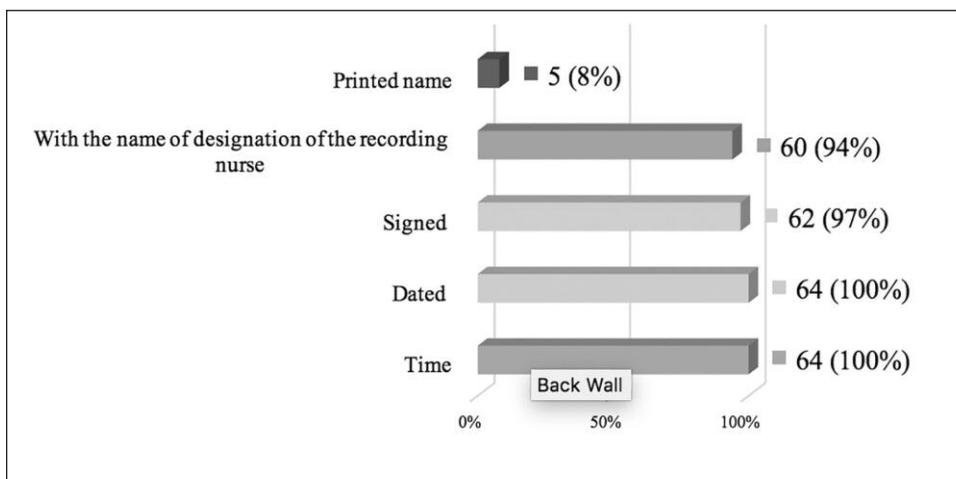


Figure 13. Documentations

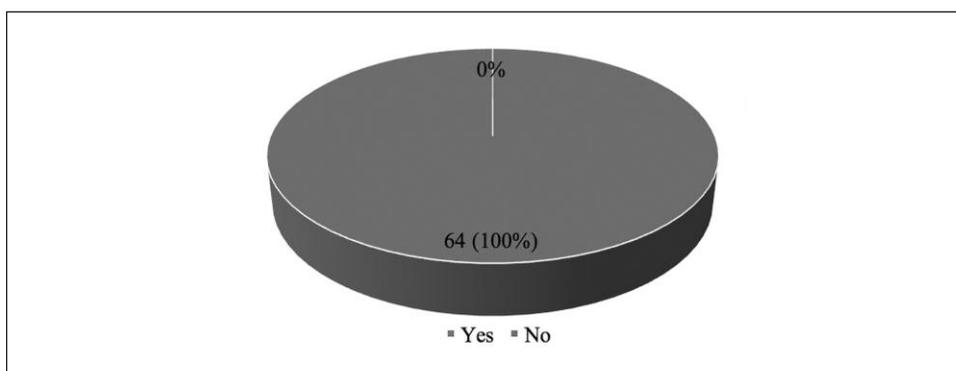
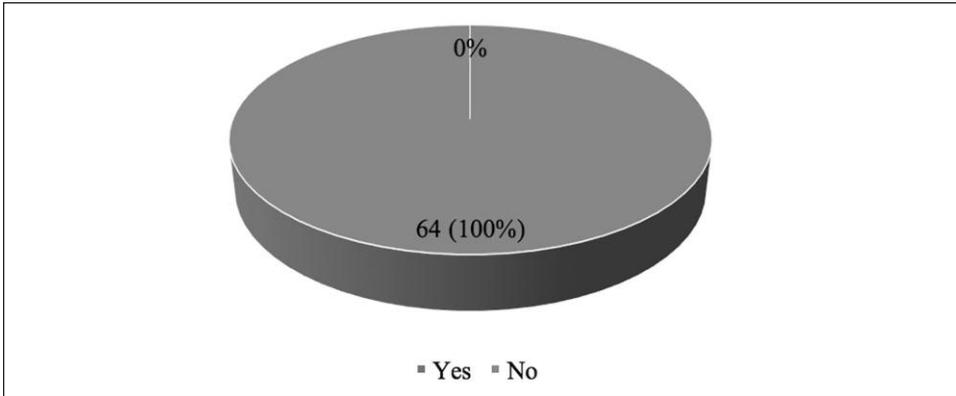


Figure 14. Evidence of discharge planning within 24 hours of admission

Of the 64 (100%) docketts audited there was no evidence of patient/family teaching within 72 hours of admission. (Figure 15).



**Figure 15.** Evidence of patient/family teaching within 72 hours of admission

## Results

### PERSPECTIVES OF REGISTERED NURSES UTILIZATION OF THE NURSING PROCESS IN THE MANAGEMENT OF THE MENTALLY ILL PATIENTS

The nursing process has been accepted by the nursing profession worldwide as a standard for providing on-going nursing care that is adapted to individual client's needs (Afolayan, Donald, Baldwin, Onasoga & Babafemi, 2013). Findings from the study revealed that 22 (96%) of the 64 respondents agreed that the nursing process can be used as a tool to manage the mentally ill. The nursing process tool took into consideration the nurse-patient relationship as well as the patient and their families as a whole and apart of the nursing process (Nursing Theories, 2013).

Gonzalo, 2011 cited Orlando theory 1972 that used the concept of human interaction to emphasize the individuality and the dynamic nature of the nurse-patient relationship. Based on results from the study, this agreed with Orlando theory cited by Gonzalo. The finding indicated that 23 (100%) of the Registered Nurses surveyed were in agreement that the nursing process had a positive effect on patient care. In addition Seaback (2013) also supported the research findings, when the author postulated that effective implementation of the nursing process led to improved quality of care. Throughout the nursing process, the nurse utilized interpersonal, technical, and intellectual skills, and organizes the care plan according to client problems, strengths, or both.

Accurate nursing documentation is a very important tool in the nursing process and is relevant to outcomes. The documentation of care given or withheld acts as a means of communication and fostered the continuity of care of the client from admission to discharge (Daskein, Moyle & Creedy 2008). This research findings concurred that 23 (100%) of the Registered Nurses believed that they were knowledgeable of the nursing process and its applicability.

In addition, 21(91%) of the Registered Nurses indicated that they used and documented the nursing process on a daily basis, whereas 2 (9%) did not. Beck (2011) supported our research findings that the nursing process is an interactive, problem-solving process which used a systematic and individualized way to achieve outcomes of nursing care.

#### **ROLE OF REGISTERED NURSES IN UTILIZING THE NURSING PROCESS IN THE MANAGEMENT OF THE MENTALLY ILL PATIENTS.**

Wang, Hailey & Yu (2011), established the nursing process as a key element of the nurse's role in research, education and practice. Findings from the study revealed that majority of the Registered Nurses, 10 (44%), were 36 years and over. They were followed by nurses between the ages of 31 to 35 years accounted for 7 (30%). In addition, 16 (68%) of the Registered Nurses were Level 1 nurses whereas 5 (23%) were Level 2 trained nurses. This age group of nurses agreed with Donald, Baldwin, Afolayan, Onasoga & Babafemi (2013) who evaluated the utilization of the nursing process and patient outcome in a psychiatric ward that, despite its benefits, many nurses were not able to fully understand and put into practice the nursing process. This may lead to poor patient care and outcome. Findings from the study concurred that although the trained nurses at the hospital had good theoretical knowledge of the nursing process, it was not applied in the care of their patients.

As it relates to the academic qualification illustrated in the study, 19 (83%) of the nurses have completed their BSc. in Nursing followed by 3 (13%) who did Diploma. Majority of the Registered Nurses with four (4) years experience represented 10 (44%). Nurses with five to nine years' experience represented 9 (39%) of the nurses and the remaining 4 (17%) had at least 10 years' experience of the work.

Alemseged et al, (2014) highlighted that nursing schools' use of language in explaining the nursing process impacted nurses attitude in understanding and effectively utilizing the nursing process. With nurses graduating with BSc. in Nursing or diploma in nursing, each category appears to have a different approach to the

nursing process. Alemseged et al (2014) highlighted that nurses with BSc. in Nursing had a better understanding of the process than diploma nurses.

Findings from the study revealed that Registered Nurses and psychiatric nurses accounted for only 1 (4%) respectively of the group that least utilized the nursing process. However, the Registered Nurses, 20 (88%), indicated that student nurses mainly utilized the nursing process. In addition, Edet et.al, (2013) supported the findings in their study that nurses are seventeen (17) times more likely to see fewer barriers in implementing the nursing process with a higher qualification. Despite this, nurses who are qualified with BSc. in Nursing versus those with a diploma; agreed that increased client ratio was a deterrent in using the nursing process (Alemseged et al, 2014).

However, findings from the study revealed that the years of experience does not ensure the use and documentation of the nursing process on a daily basis as the majority of nurses regardless of their years of experience do not use nor document the process daily. Hence there was no relationship between years of experience and use and documentation of the nursing process. In addition, academic qualification does not guarantee the use and documentation of the nursing process and most of the nurses surveyed revealed that they do not use and document the nursing process daily although they have been taught otherwise during the course of their studies. Therefore there was no relationship between academic qualification and usage and documentation of the nursing process.

#### FACTORS CONTRIBUTING TO LACK OF UTILIZATION OF THE NURSING PROCESS IN THE MANAGEMENT OF THE MENTALLY ILL PATIENTS

Fernandez- Sola, Granero-Molina, Aguilera-Manrique, Gonzales, & Castro-Sanchez et al (2011) identified obstacles and enablers when implementing the nursing process. Results from the authors study revealed that the nursing process could save time when handling documentation, and while there were factors that influenced non utilization, there were also enablers that influenced the use of the nursing process.

Registered Nurses perspectives, on the factors that prevented them from utilizing the nursing process were identified: The major factor that they revealed inhibited them from using the nursing process was the excess workload of the nurses, which all 23 (100%) of the nurses surveyed agreed to. Other major inhibiting factors

included shortage of staff 22 (96%), lack of time 20 (87%). On the other hand, the nurses revealed that the lack of stationary was not seen as a deterrent for 10 (45%). Ofi & Sowunmi (2012) from the literature revealed similar findings.

Alemseged, Aregay, Balcha, Berche & Hagos (2014), study revealed that 90% of Registered Nurses lacked knowledge in utilizing the nursing process, which resulted in 96% failing to develop a complete nursing plan. The authors study highlighted that 30% of respondents were relying on experience rather than the nursing process. On the other hand, 43% believed it was factors such as time, resource and training that made the nursing process inadequate to be used.

Registered Nurses when asked about their attitude towards the nursing process, 9 (39%) of nurses were neutral on the subject whereas a similar percentage of nurses believed that nurses had a generally poor attitude. The remaining 5 (22%) believed their attitude was good. Similarly, Daskein et al (2008) in their study assessed Registered Nurses knowledge and attitudes towards nursing documentation, together with determining the relationship between such documentation and the quality of care outcomes as established by means of relative's satisfaction levels. Their findings revealed that the Registered Nurses had sound knowledge of nursing documentation and the nursing process however time factor and length of time to document played a significant role in documentation supporting the findings of the research carried out.

Of the 23 (100%) of the nurses surveyed, 11 (48%) stated that caring for client was the major factor that influenced the nurses 'attitude towards the use of the Nursing Process. However, 13 (57%) of the respondents stated that the nurse to patient ratio influenced the proper implementation of the nursing process, while 10 (43%) did not agree.

Instefjord, Aasekjær, Espehaug, & Graverholt (2014), having conducted their research in a psychiatric hospital department, showed that nurses to a limited degree documented the patient care according to recommendations and legal requirements. This implied that deficiencies in nursing documentation identified in other clinical specialties also applied to the clinical field of psychiatry.

#### MEASURES USED TO IMPROVE THE USE OF THE NURSING PROCESS IN MANAGING THE MENTALLY ILL

According to Wang, Hailey & Yu (2011) quality-nursing documentation promoted effective communication between caregivers, which facilitated continuity and indi-

viduality of care. Continuity of care promoted a faster recovery rate for clients. The quality of nursing documentation had been measured by using various audit instruments, which reflected variations in the perception of documentation. Shortcomings of nursing documentation were identified and the effects on the quality care given. Findings revealed that research should direct greater attention to the accuracy of nursing documentation, factors leading to variations in practice and weaknesses in documentation quality and the effects, of these on patient outcome, nursing practice and evaluation of quality measurement.

The nurses identified several measures to improve the nursing process in managing the mentally ill, but the most popular factor was adequate staffing which represented 16 (70%). In addition, integrated institution policy, ongoing seminars to reinforce the knowledge of the nursing process and making the documentation process much easier by creating a form, accounted for 4 (17%) of the respondents. Implementing the use of the nursing process and low nurse to patient ratio was stated by 3 (13%) of the nurses. Other measures stated by nurses were: teamwork of nurses, doctors, psychiatric aids and patient care assistants; and implementing the use of a checklist to replace writing accounted for 2 (9%). The least number of respondents 1 (4%) stated that computerization of the nursing process resulted in more time for hands on care, re-sensitization of the staff by the in-service department, ongoing research and staff training, time management of staff and supply adequate resources.

In conclusion, the nurses on the acute wards documented the nursing process in partiality. The research findings revealed that the nurses identified that the nursing process is used and documented on a daily basis, however auditing of the clients record did not show any evidence of this documentation. Therefore the nursing process was being utilized to some extent but not documented as it should. Of the 23 (100%) nurses, 16 (70%) responded that there were five (5) steps in the nursing process as opposed to the correct number of steps been six (6). Lopes et al (2010) also found failures in recording of some steps of the nursing process. Although all steps had been used, they were not carried out consistently. Staff to patient ratio was also a major contributing factor to the non use of the nursing process in totality.

## Conclusion

The nursing process is an interactive, analytical process using an organized and individualized way to accomplish outcomes of nursing care, respects the individual's

autonomy, freedom to make decisions, be actively involved in nursing care and used as the standard for providing quality care to meet client's needs. However, there are factors that influenced the non-utilization of the nursing process. Findings from the research study revealed that excess workload and shortage of staff were the two (2) major contributing factors why Registered nurses (RN) did not utilize the nursing process.

Although there were positive benefits that can be derived from utilizing the nursing process in caring for the psychiatric patients, its non-utilization or partial utilization presented challenges in achieving optimal outcome to care given. The research findings revealed that the nurses identified that the nursing process is used and documented on a daily basis, however auditing of the clients record did not show any evidence of this documentation. The research also highlighted that Registered Nurses had good theoretical knowledge of the steps used in the nursing process but failed to incorporate all the steps in the management of the mentally ill.

## Limitations

The researchers encountered the following limitations:

- Registered Nurses did not answer all the questions thus reducing the information ascertained from the study.
- The study was conducted in one specialized psychiatric hospital in Jamaica. Hence, more than one study should be done to follow up.
- The number of Registered Nurses on the acute ward fluctuated due to staff rotation, vacation or sick leave and migration hence the exact number of nurses for the sample size was left on these wards.

## Recommendations

1. Registered Nurses should upgrade and expand their knowledge of the nursing process as part of their continuing education.
2. The standard nurse to patient ratio (1:4) should be practiced to reduce work load thus facilitating the use and documentation of the nursing process.
3. The institution should provide a mandatory checklist to help reduce the time taken to document the nursing process.

4. In-service education unit of the Bellevue hospital should conduct refresher courses for Registered nurses on an on-going basis.
5. Ongoing research by Registered Nurses who work in the field of mental health to identify ways of improving care of the mentally ill.
6. Teaching of the patients and family in the involvement of the nursing process by Registered Nurses should be done within 72 hours of admission.
7. Discharge planning of patients and family should be done within 24 hours of admission by the Registered Nurses (Figure 14).
8. Use and documentation of the nursing process should be done in totality.
9. Computerization for documentation of the nursing process by the Institution.
10. Establish annual evaluation of quality of care received from client and feedback from the relatives.

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# Students and Teacher Perceptions of Instructional Software Package, MEDiA, for the Teaching of Mechanical Engineering Drawing A Pilot Study

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## Abstract

*Some high school teachers have indicated difficulties when planning and delivering certain topics in the Mechanical Engineering Drawing (MED) syllabus. These difficulties include assembly drawing, and sectioning. The students also claim to encounter challenges with understanding, interpreting, and conceptualizing of some of the concepts taught by their teachers. The Caribbean regions' main examination body, Caribbean Secondary Examination Council (CSEC), in the years 2009 to 2011 reports confirmed these challenges faced by the students. To find solutions for these challenges, researchers in the field of Industrial and Technical Education have made recommendations for the development of an instructional aid (a software program), for teaching Mechanical Engineering Drawing. This recommendation led to the development of an instructional software program. The purpose of this study was to pilot the software program in order to determine if the intended objective was met. Twenty-nine participants (28 students and a teacher) from a technical high school in Jamaica participated in the pilot study. The teacher was asked to use the software program in teaching the topic assembly drawing on CSEC MED and to document the experience, which was later shared with the researcher. The students were asked*

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*to complete a questionnaire at the end of the lesson taught. The analysis of the feedback provided, revealed that both the students and their teacher found the software program effective for the teaching and learning of Mechanical Engineering Drawing concepts. The participants also gave suggestions on how to improve the software. These include providing orthographic projection layouts, a printable copy of the questions, and an audio pause button.*

**Keywords:** Mechanical Engineering Drawing, Assembly drawing, Active Student-Centred Learning, Orthographic Projection, Information and Communication Technology, CSEC

## Introduction

Mechanical Engineering Drawing (MED) is graphical representation of structures, machines, and their component parts that communicates the engineering intent of a technical design to the artisan or worker who makes the product (Columbia Encyclopedia, 2000). It covers the design, assembly and sectioning of machine components. MED is studied mainly by aspiring mechanical engineers, mechanical engineering technology teachers, mechanical engineering technologists and mechanical engineering technicians. Technical drawing, a component of this area of specialization, is one of the many examinations offered by the Caribbean Secondary Examination Council (CSEC) to secondary school students in the Caribbean region. Technical Drawing content is broken down into three sections: plane and solid geometry, building drawing, and mechanical engineering drawing.

Students at the secondary and tertiary levels report having difficulties understanding the concepts of assembly drawing and sectioning. Despite the teaching strategies employed by teacher education university lecturers and practicing teachers of MED in many high schools in Jamaica, anecdotal evidence suggests that challenges still exist. The researcher was a former teacher of the subject at the secondary level for over 11 years and has taught students pursuing a first degree at the tertiary level, and the challenges faced by students have been encountered by the researcher.

The anecdotal evidence from both teachers and students of MED reveal the absence or the scarcity of instructional material for the teaching of assembly drawing and sectioning. Teachers in the secondary and the post-secondary institutions have expressed similar concerns of not having adequate resources and instructional material. During the past two decades, Information and Communication Tech-

nology (ICT) and multimedia-based learning have begun to play an important role in the classrooms. The benefits of this technology have been noted by scholars who acknowledge that computer software and the Internet provide a great potential to make learning processes more accessible (Segers, 2002) and more engaging (Beuschel, Gaiser & Draheim, 2003). Mohler, (2007) recommended that the pictorial drawing process be used as a teaching technique for engineering drawing courses. It was determined that an instructional aid software would be an invaluable accessory to accompany printed material in the teaching and learning process of MED.

Another significant variable noted by teachers of technical drawing is that students found it difficult to visualize three dimensional (3D) models when shown a two dimensional (2D) drawing. This was later compounded when students were required to assemble a number of machine parts in addition to producing sectional views. Human information processing theorists, also argue that PowerPoint features may influence learning (Schunk, 2012). One such theory is Paivio's dual coding theory of memory and cognition. According to Paivio (1986), as cited in Nouri and Shahid (2005), in relation to the dual coding theory, the imagery system processes information about nonverbal objects including images for shapes, pictures, models, animation, colour and sound. The Caribbean Examination Council (CXC) Annual Examiner's Report for the period 2009 to 2011 highlighted these deficiencies in secondary school students' output. These reports indicated that a high percentage of students, during the period mentioned, were unable to produce correctly assembled parts and sectional views. Most sectional views were incomplete and had incorrect hatching details. The idea of developing comprehensive interactive instructional aid software, is based on the many challenges faced while teaching MED at both the secondary and tertiary levels. According to Reynolds and Baker (1986), as cited in Nouri, and Shahid (2005), presenting material on a computer increases attention and learning, and learning will increase as attention is increased.

The aim of the study is to ascertain students' and class teacher's perception of MEDiA as an instructional software for teaching mechanical engineering drawing. The study is also aimed at determining how multimedia-based learning can improve the teachers' delivery skills, as well as improve students' learning abilities, attitudes and achievements. The study also examined the teachers' and students' perception of the MEDiA software.

## MEDiA

MEDiA is an interactive instructional software that serves two key functions. Firstly, it provides easy and interesting aids for tutors/teachers at the secondary level, technical training institutions and colleges. Secondly, it provides a source of reference, and is a useful learning tool, for students preparing to sit the Caribbean Secondary Examination Certificate (CSEC) in Technical Drawing (Mechanical) and other examinations.

### INSTRUCTION AID SECTION

The instructional aid section includes a total of six (6) problems taken from the Caribbean Secondary Examination Certificate (CSEC) Technical Drawing (Mechanical) Examination past papers. Each design has the following components: two dimensional (2-D) working drawing, three dimensional (3-D) exploded view, 3-D assembly model, 3-D assembly sectional model, and 2-D sectional assembly drawing. Relevant explanations and learning activities for each design are presented in order to reinforce key concepts that are necessary especially when doing assembly drawing and sectioning. The learning activities that are included consist of quizzes and practical exercises.

### ASSESSMENT

There are four interactive quizzes and two practical challenges. For each interactive quiz, there are four options lettered 'a' to 'd'. A correct answer prompts users to move to the next item, and an incorrect answer prompts users to "try again". Finally, two extra design questions are provided for student-practice, in order to reinforce the concepts of assembly drawing and sectioning.

### Literature Review

According to Bull (2013), the advent of computer technology dramatically increases possibilities for developing dynamic and interactive representations. Interactive digital learning material will revolutionize educational presentations and enhance e-learning delivery when aligned with Cognitive Constructivist Theory of Multimedia to produce dynamic presentations that create a balance between the learners' prior verbal and visual experiences, sensory repository, multiple intelligences and

learning styles to construct new knowledge. New technologies provide new opportunities to improve learning and instruction. Learning environments and instructional systems are properly viewed as parts of larger systems rather than as isolated places where learning might occur. Moreover, learning takes place in more dynamic ways than was true in the teacher-led paradigm of earlier generations (Harvey, Huett, Bond, & Moller, 2009). Rogers (2014) posited that it is in an educator's best interest to explore the options presented by technology, from cameras to different software programs to the virtual world. We currently can use technology to engage our learners more successfully through software programs, online formats, applications, and much more.

In line with this view an interactive courseware has been adopted as an effective learning tool to motivate students to become active participants in the teaching and learning process (Burgess, 2003), and to improve students' learning performance (Raisinghani, 2003). Ainsworth (2006) argued that multi-representational environment provides increased potential for adjustment to individual differences in representational preference or skills, for allowing multiple strategies or for fulfilling a range of different tasks.

Using 3D animation, the operating principle of mechanisms is shown clearly and visually. Moreover, it can inspire the enthusiasm of students for mechanical engineering. Chin (2009) aptly noted that graphics fundamental knowledge and practicing of 2D drawing and 3D virtual modeling are combined in practice teaching, so it can train the engineering consciousness and creative ability of students. Fountas and Pinnell (2001) as cited in Rogers (2014) found that when content is illustrated with diagrams, students could maintain the information or knowledge over a period. Petrina (2007) highlighted that there are challenges in communicating knowledge in science and technology. On one hand, this knowledge can be complex and difficult to articulate. To overcome these challenges, scientists and technologists resort to graphic and visual forms. Imagine the common set of directions for the assembly or use of a commercial product. Most written directions would be indecipherable without visual forms. Animations, charts, diagrams, drawings, figures, schematics, and tables are used liberally in technical communications. The new technologies or ICT have transformed the appearance of technical information, but basic principles of graphic design continue to underwrite the new visual aids. Visual aids, when used properly, do not merely contribute to the communication content of demonstrations and presentations. They act as visual cues for one and can actually add credibility to one's efforts. According to Cerra, P.P.,

Gonzalez, J. M., Parra, B. B., Rodriguez, D., & Penin, O. P. (2014) the use of Web-based graphic interactive tools to learn engineering drawing can be considered a significant improvement in the teaching of this kind of academic discipline.

## Methodology

### RESEARCH DESIGN

In order to answer this research question: *What* is the perception of students and class teacher of MEDiA as an instructional software for teaching mechanical engineering drawing? A practical action research design with primarily qualitative features was employed to capture the perception of the participants. This design, described by Creswell (2008) as the most applied, practical design which provides educators with an opportunity to reflect on their own practices, thereby exploring and developing solutions to practical problems, was chosen for this study. Qualitative techniques were used to inform the study during the design phase and to aid conceptual and instrument development. In addition, qualitative data were gathered through individual interview with the class teacher.

### PARTICIPANTS

For this pilot study no sampling was done. The participants for this study were the aspiring engineering students of Home Economics and Engineering 11 'A' (H/E 11<sup>A</sup>) class at a selected urban technical high school in Jamaica. This class consists of students who were being prepared for the CSEC examination in technical drawing (mechanical) in 2014, and those who were preparing for internal technical drawing examination (mechanical) that same year.

### PROCEDURE

MEDiA was used to deliver a lesson in assembly drawing and sectioning in a mechanical engineering drawing class. The pilot test of MEDiA was conducted in the designated technical drawing laboratory. The additions to the classroom were the digital apparatus; computer technology and multimedia projector, which were used to project the content and audio of MEDiA. The mechanical engineering assembly drawing assignment for this study complexity level was suitable for the participants. The teacher in this context acted in the capacity of a facilitator of

learning. The students were asked to freehand sketch the assembly drawing and sectioning of the given component. This request was made after the software was used to explain the drawing and what was required for completion. They were instructed to freehand sketch, because their drawing ability and accuracy were not in question, only their ability as it relates to assembly and sectioning of a given component. At the end of the lesson, the students' work were collected, graded, and recorded. In addition, the students were asked to complete the questionnaire to obtain their perception of MEDiA as an instructional aid (see Appendix A). A five-point Likert-scale evaluation rubric ranging from 1 (strongly disagree) to 5 (strongly agree) was employed to evaluate the objectives of MEDiA. An interview was conducted with the teacher in order to obtain his feedback on MEDiA as an educational software. The questionnaire items were tabulated and analyzed using Microsoft Excel software. The analysis methods included the use of descriptive statistics such as the mean and percentage.

Figure 1 to figure 6 show the two dimensional and three dimensional drawings and models of the machinist's jack design used in the pilot study. Figure 1 to Figure 5 was used in the delivery of the lesson and figure 6, the solution, was used after the class activity to reinforce the concept of mechanical engineering assembly drawing and sectioning. Also, for figure 1 to figure 6 the verbal requirements and verbal explanation that accompany each figure are outlined below.

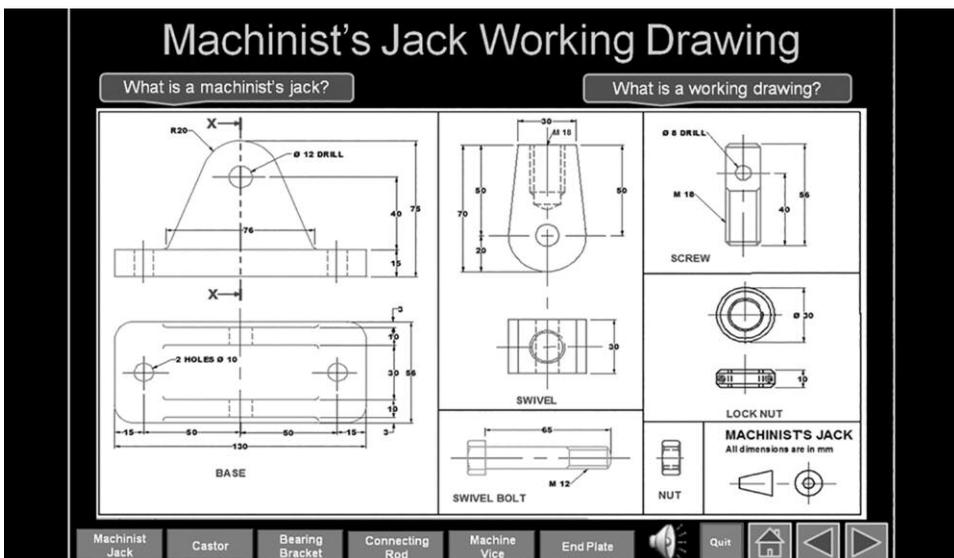


Figure 1. Shows the working drawing of the parts that make up the machinist's jack

The swivel is fitted into the base and is held in place by the swivel bolt. The operating height is set on the screw and is locked in place by the lock nut.

The participants are required to:

- A. Draw at full-scale ratio 1 to 1 and in first-angle or third-angle orthographic projection, the following views of the machinist's jack fully assembled:
  1. The front elevation
  2. The plan projected from the front elevation, and
  3. The full sectional end view with the section taken on the cutting plane X – X.
- B. Insert TEN main dimensions.
- C. Show hidden details in the front elevation only.
- D. In the lower right-hand corner of the drawing paper
 

Print:

  1. the title 'MACHINIST'S JACK'
  2. the scale used, and
  3. show the symbol that represents the projection method used.

The exploded view of the machinist's jack shows that the swivel should be fitted into the base, and is held in place by the swivel bolt and nut. The screw should be screwed into the lock nut, and then into the swivel. (Figure 2).

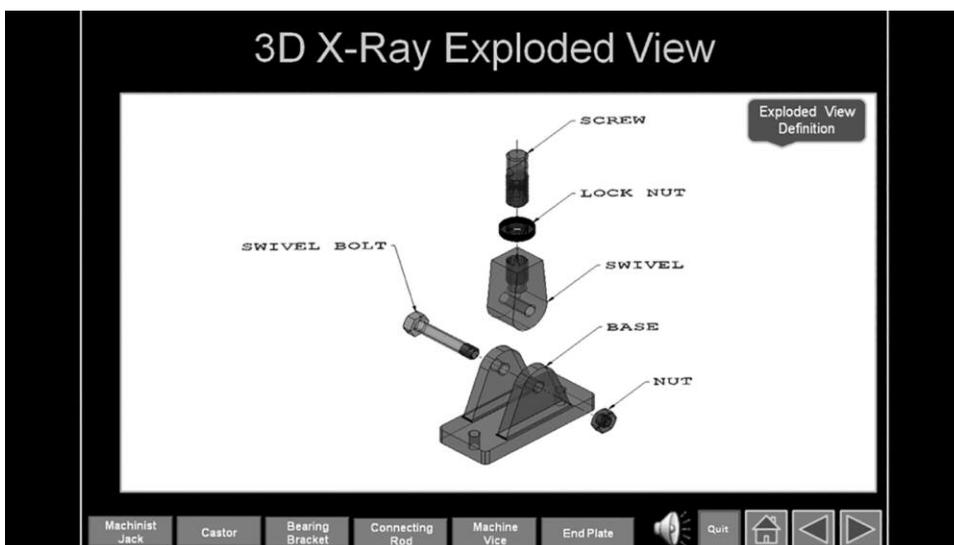


Figure 2. Shows the exploded view of the machinist's jack

This model shows the machinist's Jack as a 3 D assembly with all its parts in their correct position. The swivel is fitted into the base, and is held in place by the swivel bolt. The operating height is set on the screw and is locked in place by the lock nut. (Figure 3).

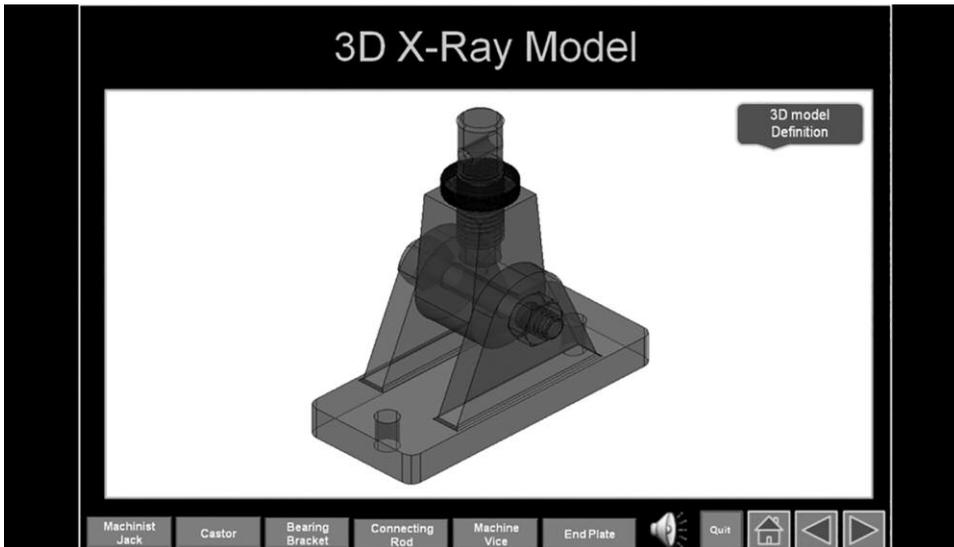


Figure 3. shows a 3 D X-Ray model of the machinist's jack

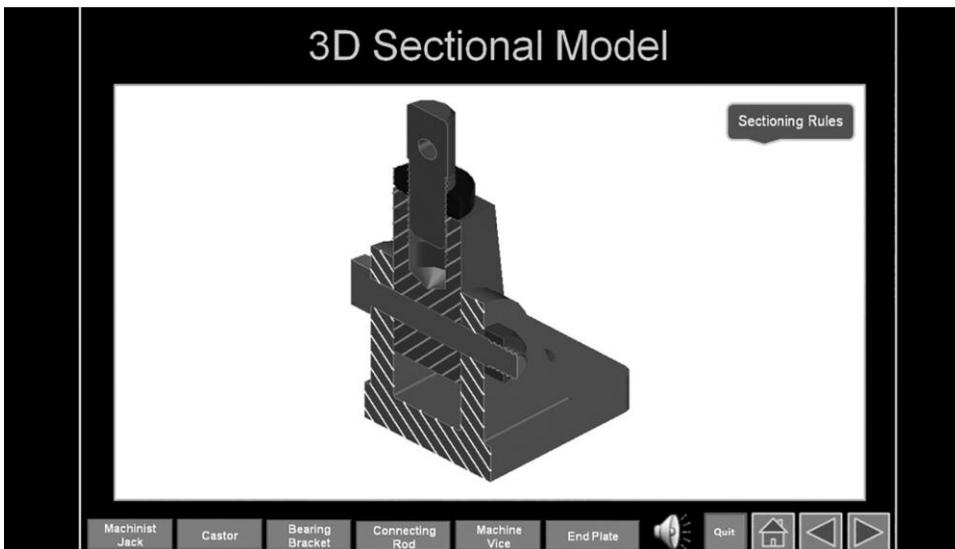
The transparent rectangular shape represents the cutting plane X-X. The cutting plane passes fully through the object; therefore the section is known as a full section. In order for you to produce the sectional end elevation X-X, the machinist's jack is imagined to be cut along this plane. The portion of the assembly in front of the cutting plane is imagined to be removed so that the internal features can be viewed on the remains of each component on the opposite side of the cutting plane. (Figure 4).

This model shows a 3 D sectional solid model of the machinist's jack cut along the cutting plane XX. In mechanical assembly drawing, cross-hatchings drawn at an angle of 45 degrees are used to represent areas that are sectioned. Adjacent parts are sectioned in the opposite direction. The base and swivel were hatched while the nuts, bolt, and screw were not as they were cut longitudinally. (Figure 5).

The sectional assembly drawing of the machinist's jack was done in first angle orthographic projection. The sectional end elevation was developed from the front



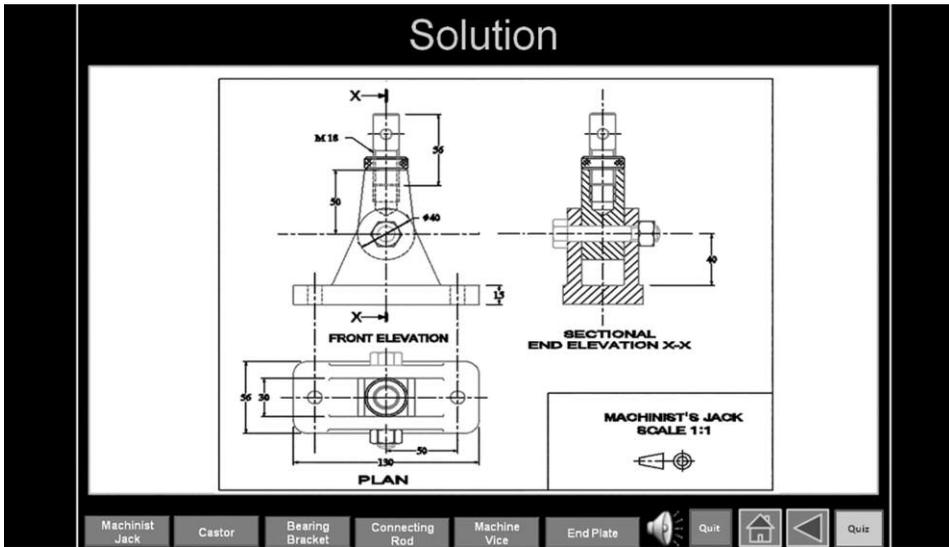
**Figure 4.** Shows a 3 D solid model of the machinist's jack and cutting plane



**Figure 5.** Shows a view of the 3 D sectional model of the machinist's jack

elevation and the plan. It was projected to the right of the front elevation because the imaginary cut surfaces were viewed from the left of the front elevation in the direction of the arrows on the cutting plane X-X. (Figure 6).

To complete the answer to the question, ten main dimensions were inserted.



**Figure 6.** Shows a view of the Machinist's Jack sectional assembly drawing

The main dimensions are the overall width, depth and height. In addition, important diameter or radius, thread specification, and the vertical and horizontal distances for the location of main reference centre.

The title, scale and projection symbols were affixed to the lower right-hand corner of the drawing paper.

## Findings

All the participants were males. Of this number, 42% were preparing for internal, and 58% were preparing for the CSEC external examination. The results revealed that the majority of students acknowledged that MEDiA met a relevant educational need. The overall technological, pedagogical and content approach used to deliver the course was effective.

The respondents reported that MEDiA has provided the knowledge needed by a teacher for effective pedagogical practice in a technology enhanced learning environment that will allow the teacher with more time to facilitate learning. A majority of respondents perceived the MEDiA software as a valuable instructional aid. The analysis revealed that 86% of the respondents had a positive attitude toward MEDiA as an instructional software. Only 14% of the respondents were unsure

**Table 1:** Means and Percentage of a Survey on MEDiA objectives (Scale of 1–5, higher score = more agreeable to the statement)

No.	Survey Questions	Means	Percentages
1	Meets relevant educational needs	4.7	93.3
2	Material is presented clearly and interestingly	4.5	89.2
3	Follows progression of skills	4.3	86.7
4	Provides suitable stimuli and reinforcement methods	4.0	79.2
5	Enhances content delivery and object visualizations	4.1	82.5
6	Alleviates difficulties faced by teacher in lesson delivery	3.7	74.2
7	Improves students attitude towards learning	4.4	87.5
8	Students have the opportunity to correct errors	4.4	88.3
9	Help students make the connection between 2D drawing and 3D models	4.3	86.7
10	Gives clear explanation and illustration of assembly drawing and sectioning	4.8	95.5
11	Appropriate for classroom settings	4.4	87.5
12	Maximizes teaching time	3.9	78.3
13	Inspires enthusiasm in students for Mechanical Engineering Drawing	4.4	87.5
14	An invaluable accessory to accompany printed material	4.0	80.0
15	A reference source for Mechanical Engineering Drawing	4.2	83.3
16	Provides an interactive platform	4.5	89.2
	Averages	4.3	85.5

about the overall effectiveness of MEDiA. The findings of the respondents' attitudes towards MEDiA are summarized in Table 1.

The teacher reported that MEDiA is an important instructional software for the contents of assembly drawing and sectioning, and that it is extremely beneficial to students who has low spatial ability.

## Discussion

This study examined the efficacy of MEDiA as an instructional aid for mechanical engineering assembly drawing. During the past two decades, Information and Communication Technology (ICT) and multimedia-based learning have begun to play an important role in the classrooms. Multimedia-based learning, such as MEDiA, can improve the learning environment for the teaching of mechanical engineering assembly drawing. In response to MEDiA's appropriateness for the classroom, 87.5% of the participants agreed that the software was appropriate. Harvey et al., (2009), suggested that new technologies provide new opportunities to improve learning and instruction. Learning environments and instructional systems are properly viewed as parts of larger systems rather than as isolated places where learning might occur. Moreover, learning takes place in more dynamic ways than was true in the teacher-led paradigm of earlier generations. As postulated by Petrina (2007), new technologies or ICT have transformed the appearance of technical information, but basic principles of graphic design continue to underwrite the new visual aids. Visual aids, when used properly, do not merely contribute to the communication content of demonstrations and presentations they enhance learning. Therefore, the results enhance the validity of those proponents' statements regarding the positive perspectives towards instructional aid, such as, MEDiA

With respect to the effectiveness of MEDiA presentations, the results demonstrated that in comparison to the traditional method of teaching mechanical engineering drawing without MEDiA, students responded that MEDiA presentations were more beneficial and they seemed to have positive attitudes towards the instructional aid. An empirical study by Nouri and Shahid (2005) has concurred that measurable progress in students' retention of information occurs when instruction is supported by appropriate instructional aids.

A teacher who was interviewed reported that MEDiA is an important instructional software for the contents of assembly drawing and sectioning, and that it is extremely beneficial for tactile learners. Mohler (2007) suggested that one of the significant differences between an individual's high and low spatial ability is his/her ability or inability in object decomposition. Mayer and Sims (1994) cited in Rafi, Samsudin, & Ismail (2006) explained spatial ability is the ability to rotate or fold objects in two or three dimensions and imagine the changing configurations. This skill becomes evident when individuals are engaged in activities rich in visual and spatial content such as engineering. The powerpoint platform on which MEDiA

was developed, graphics and models represented, content and verbal and nonverbal explanation of MEDiA will help to develop student spatial ability in accordance with the dual coding system. Mohler also recommended that the pictorial drawing process should be used as a teaching methodology.

It is the author's recommendation that a full research be conducted with MEDiA before adopting it at the secondary level by the education ministries in the region, or at the tertiary level for pre-degree and undergraduate students who are pursuing engineering courses.

Generally, further researches on the efficacy of instructional aid presentations should be encouraged to investigate the change in attitudes towards digital media and learning outcomes.

## Conclusion

The result of this development is a software that will help to alleviate difficulties faced by teachers and students in the teaching and learning process of MED. MEDiA is an innovative instructional software for MED that will support, supplement, or reinforce the content of Mechanical Engineering Drawing.

Mechanical Engineering Instructional Drawing Aid (MEDiA) software will serve two key functions. Firstly, it will provide aids for tutors and teachers at the secondary level, technical training institutions and colleges. Secondly, it will provide a source of reference and serve as a useful learning tool for students. In producing this instructional aid, emphasis was placed on simplicity in an effort to make MEDiA unambiguous, interactive, informative, and student-centered. The results from a pilot test conducted at a secondary school showed that 86% of students thought that the software is an effective instructional software.

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# Business & Computer Studies Student Teachers and ICT Are they ready to Change Pedagogies and Raise Standards in Schools?

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## Abstract

*The use of Information and Communication Technologies (ICT) in the classroom has taken centre stage in most discourse about education in Jamaica. This has led to an increased demand on teachers to improve pupils' grades especially in the external school leaving examinations through the use of ICT in teaching and learning. It is the belief in Jamaica that the use of ICT in the classroom can change things for the better and that therefore, the proper preparation of teachers to use ICT is an imperative. This study sought to determine whether student teachers who were pursuing Business Studies and Computer Studies at the tertiary level were using ICT with a view to improving pupils' performance. Final year student teachers pursuing Business Studies, Computing, Administrative Management and education and training in three types of institutions: a university, a teachers' college and a vocational training institution participated in the study. A total of 99 student teachers from the three institutions completed questionnaires, answered interview questions and engaged in focus group discussions. A case study approach using mixed methods was used to analyse the data. The quantitative analysis made use of descriptive statistics, cross tabulation and Kruskal Wallis test. The qualitative analysis used the thematic analysis approach by Braun & Clarke (2006) which produced a number of themes. The results revealed that many of the students said they were dissatisfied with the general level of supervision they received from both the cooperating teachers and lecturers.*

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*Trainee teachers use of ICT favoured multimedia presentations, in particular PowerPoint software and text and pictures to improve class activities, improve learning and provide notes for the pupils. Among the recommendations are that there should be continuous ICT training for all teacher trainers including cooperating teachers and the provision of a national ICT curriculum for all teacher training institutions.*

**Key words:** Student teachers, pedagogy, ICT, teacher training Institutions Business Studies, Computer Studies

## Introduction

### BACKGROUND

The use of ICT in the classroom is an imperative for all teacher training institutions. The three categories of teacher training institutions that participated in this study were university, teachers' college (TC), and technical and vocational institution (TVI). These institutions are expected to include the use of ICT in their teacher training curriculum. Their mandate is to prepare business and computer studies teachers to teach business and Information Technology (IT) subjects at the Caribbean Secondary Examination Certificate (CSEC) level offered by the Caribbean Examination Council (CXC). Technical Vocational Education and Training (TVET) has been the preferred methodology promoted by the Government of Jamaica to be used in teaching technical subjects. As such, ICT has become an integral part in the delivery of TVET. This is supported by the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Information Technology in Education (UNESCO IITE, 2014). ICT is one of the key tools in the provision of TVET.

The National ICT Strategic Plan has as one of its sector outcomes; "An educated and trained workforce and citizenry that can function optimally in a knowledge-based society" (Vision 2030 Jamaica, 2009, p. 58). If this outcome is to be achieved, those whose business it is to prepare the nation's citizenry must themselves be comfortable with using ICT to teach. At the same time, there is the belief within the Government that well trained teachers engaged in, the use of ICT in particular, will improve school pupils' performance. This assumption by the Government is grounded on teachers being well trained to use ICT in teaching.

Jamaica's National Education Strategic Plan (2011–2020) sets out performance targets for students sitting the (CSEC) examination; a target of 90% of the age cohort sitting CSEC as the exit examination by 2015, and a target of 54% of students sitting CSEC to attain 5 subjects by 2016 (Ministry of Education, 2012). The results for 2015 revealed that approximately 35% of students who sat CSEC passed 5 or more subjects (Ministry of Education, 2015). The education sector has not been achieving its target and teachers' competencies are being questioned.

The Chief Inspectorate Report commissioned by the Ministry of Education (MoE) (2013) highlighted the fact that the "available ICT is rarely used by teachers and when it is done it was mainly confined to PowerPoint presentation" (Ministry of Education, 2013, p.17). The inspectorate believed that this limited use of ICT was not the best way of integrating technology into the teaching of subject content.

When teachers' competence regarding the effective use of ICT is called into question, then teacher educators must respond by investigating their practice with a view to strengthening weak areas. The purpose of the study was to determine whether student teachers were using the ICT properly according to the Ministry of Education expectations and the UNESCO ICT Competency Framework for Teachers (ICT-CFT). It also sought to determine if there are differences in pedagogy between institutions and possible causes of the apparent lack of proper use of ICT in schools.

## The Problem

There seems to be an overall weakness with Jamaican teachers using ICT in schools and this was confirmed by The Chief Inspectorate Reports of 2013 and 2015. This problem is important to investigate because there is a perception that the use of ICT in education will have positive impact on learning in Jamaican schools. Educationalists are claiming that the ICT tools are not being well used or have been used improperly in schools.

## RESEARCH QUESTIONS

1. How do student teachers perceive and understand ICT and its role in teaching?
2. How do they approach ICT in planning their teaching and use it to facilitate learning?

3. What aspects of ICT do student teachers use in their teaching? How do they do this?

## RESEARCH HYPOTHESES

The null Hypothesis (Ho)

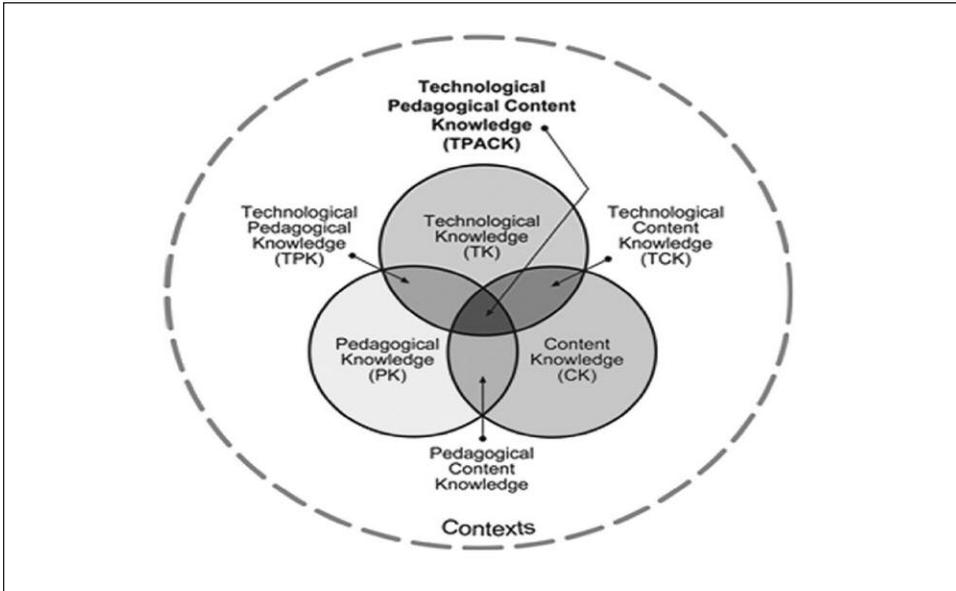
1. There is no association between the student teachers understandings of ICT and their teacher training.
2. There is no association between the student teachers' approach to planning their lesson and their teacher training.
3. Student teachers' training does not determine the ICT student teachers' use in their teaching.

## KEY CONCEPTS/ THEORETICAL FRAMEWORK

The Technological Pedagogical Content Knowledge (TPCK) theoretical framework (See figure 1 on page 103) was chosen because it provides a framework and methodology through which the research questions were answered. This theoretical framework describes the philosophical position that underpins the methodology as recommended by Crotty (1998). The TPCK had its genesis in Shulman (1986) Pedagogical Content Knowledge (PCK) while Mishra and Koehler (2006) added the “technology knowledge” component to Shulman’s PCK model to enhance our understanding of good teaching with technology. The integration of technology into teaching and learning is a complex and multidimensional process which TPCK seeks to address. According to Pamuk (2012), the three knowledge bases pedagogy, content and technology founded in TPCK are essential for technology integration. TPCK brings together the three knowledge bases in order to provide a way for designing, analyzing, implementing and evaluating the use of ICTs in education (Unwin, 2007).

## Research Methodology

The data collection methods included survey, interview and focus groups. A survey using questionnaires was used to collect data from the sample. It was used to collect demographic facts not normally collected using other instruments and facts that can be written in fixed-format, be open-ended and analyzed using a rating scale.



**Figure 1.** Technological Pedagogical Content Knowledge Framework (retrieved from Pamuk (2012)).

Interviews were used because they provide an easy way to capture the data in the participants' own words and then use the responses to provide a rich account of their understandings of ICT and its uses. Creswell (2008) supports this view of the use of interviews, as according to him, they will allow participants to describe detailed personal information in their own way. A focus group consisting of four participants who volunteered from the teachers' college provided additional information has used to design the focus group for the university student teachers.

The population of business and computer studies students from which the sample was drawn is approximately 55 students from the university, 40 students from the teachers college and 36 from the vocational training institution ( $N=131$ ). The sample was ( $n=131$ ) because the population was small. The sampling methods used were a combination of purposive sampling and convenience sampling. Purposive sampling is a non-probability or non-random sampling technique.

According to Neuman (2003), purposive sampling uses "the judgment of an expert in selecting cases or it selects cases with a specific purpose in mind" (p. 213). Using purposive sampling, all the business and computing students from the three institutions were targeted to participate in this study. All students were invited to complete the questionnaire because the total number of students in each

programme of study was not very large and the researcher is of the opinion that this was a perfect representative sample. All business and computer studies students were invited to participate in the interviews, however only approximately ten percent of students from each institution responded. All students were invited to participate in the focus groups however only four volunteered from the teachers college and six from the university.

The data collected from the questionnaires were analyzed using the SPSS 22. The types of questions on the questionnaire were partially closed-ended question, closed-ended items and 5-point Likert Scale ranging from 1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree and 5-Strongly Agree. Statistical Information for this study was presented using bar graphs, pie charts, frequency tables and cross tabulation. Descriptive statistics such as mode was used to simplify some of the data. The researcher also used other statistical tools such as the Kruskal-Wallis test which includes chi-square tests. Data captured from the interviews and focus groups were analyzed using NVivo 22. The researcher used Braun and Clarke (2006) six steps approach to “Thematic Analysis” to develop themes/categories that were important or of interest to the research questions with a view to gain a better understanding of the issues.

## Results

Three tertiary level institutions participated in the survey and a total of 105 questionnaires were issued to the student teachers. Of the 105 issued, only seven were deemed unusable because of the number of missing responses leaving a total of 99 usable questionnaires. The response rate was 94.2%. Table 1 shows a summary of the participants.

**Table 1:** Distribution of the Number of Participants by Institution

Institutions	Frequency	Percentage
University	36	36.4
Teachers College	33	33.3
Vocational Training Institution	30	33.3
<b>Total</b>	<b>99</b>	<b>100</b>

DEMOGRAPHICS

The demographic data collected from the students revealed that the majority of students 70.7 % (n=70) surveyed were business studies students from the three institutions. Student who opted to pursue computing and administrative management were from the university and those pursuing education and training were from the vocational training institution. See Table 2 below.

**Table 2:** Distribution of the Number of Student Teachers by Course

Programme of Study	Frequency	Percentage
Business Studies	70	70.7
Computing	5	5.1
Adm Mngt	7	7.1
Education & Training	17	17.2
<b>Total</b>	<b>99</b>	<b>100</b>

The demographic data collected from the student teachers also revealed that the majority of students surveyed were females representing 80.8% (n=80) of the participants while males accounted for 19.2% (n=19). See Table 3 below. It is not uncommon to see female students outnumbering male students in a programme of study at the tertiary level.

Student teachers from the various teacher training institutions were asked to rate the ICT facilities at the school where they participated in the teaching practice exercise. The university students recorded the highest rating 54.3% in the “good” category compared to the TC 14.3% and the VTI 31.4%. The Chief Inspectorate Report (2013) defines “good” as, “the expected level for every school” (p.7). When the scores are grouped together, the majority of the student teachers 37% rated the

**Table 3:** Distribution of Sample by Gender

Gender	Frequency	Percent
Male	19	19.2
Female	80	80.8
<b>Total</b>	<b>99</b>	<b>100</b>

ICT facilities as satisfactory. In other words, they gave the schools ICT facilities a mere passing grade. The Report defines “satisfactory” as, “the minimum level of acceptability required. All key aspects of performance and provision in every school should reach or exceed this level” (p. 7). Also important is the fact that 18.2% of all the student teachers rated the facilities as unsatisfactory. “Unsatisfactory” is defined by the Report as, “quality not yet at the level acceptable for schools” (p. 7). The overall picture is that the ICT facilities in some of the schools are not at the place where the government want it to be.

Student teachers were asked which ICTs were available to them. The majority mentioned desktop computers, printers, tablets, Internet, multimedia projector and interactive whiteboard. It is important to note that availability does not necessarily mean that the student teachers had access to the equipment as often as they would like. When they were asked if they had access to the ICT devices for their classes, the majority of students responded “sometimes” but an alarming number of students responded rarely and never. The result reveal that the university students had more access to ICT than the other institutions. See Figure1 below.

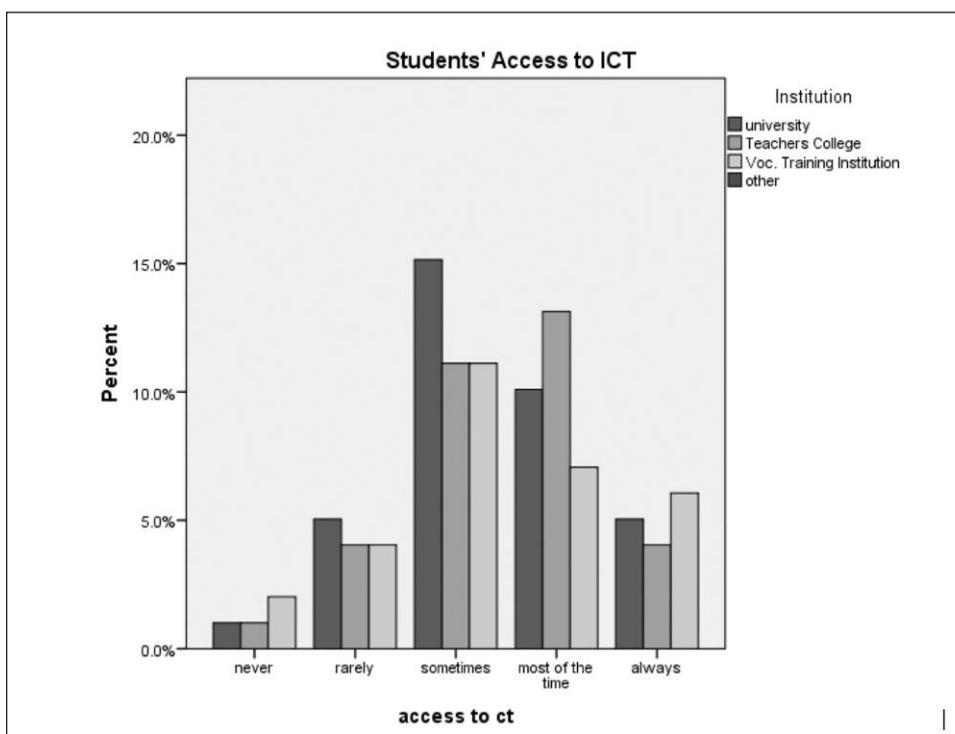


Figure 1: Student Teachers Access to the ICT at the schools

QUANTITATIVE FINDINGS

The first research question sought answers relating to the use of ICT and how it allows teachers to complete their lesson on time, makes teaching easier, improves grades, maintain pupil attention, classroom behavior management strategy, increase pupils’ interest, entertain pupils and assist underachieving students.

The student teachers perceived that the use of ICT assisted them in completing their lessons on time. All three institutions recorded the highest percentage in the “agree” category. In this category, the university students recorded 50%, TC 45.5% and VTI 40%. A significant number of university students were undecided when asked if ICT enabled them to complete their lesson on time. The university students recorded the highest percentage in the “undecided” category which was 19.4% followed by the teachers college 18.2% and the vocational training institution 10%. This would suggest that many student teachers were not sure if they were able to complete their lesson on time when ICT was used. The majority of student teachers said that ICT made teaching easier. The chi-square test rejected the null hypothesis and proved that there is an association between the students’ understandings with regard to teaching being easier and the training institutions. The results in Table 4 were achieved by using Kruskal Wallis Test and revealed that there is a difference in the mean ranks of institutions. The null hypothesis is therefore not true. The three institutions do not appear to be equal in their rating of the use of ICT to make teaching easier. Table 5 illustrates that the difference in ranking is significant represented by ( $X^2 = 1.685$ ,  $df = 2$ ,  $P = .431$ ).

**Table 4:** Make Teaching Easier Mean Ranks

Institution	N	Mean Rank
University	36	46.6
Teachers College	33	54.76
Voc. Training Institution	30	48.85
<b>Total</b>	99	

Kruskal Wallis Test

**Table 5:** Test Statistics<sup>a,b</sup>

Statistics	Teaching Easier
Chi-Square	1.685
df	2
Asymp. Sig.	0.431

Student teachers were asked if pupil grades improved when ICT were used to aid teaching. The majority of student teachers were undecided about whether pupils grades improved when ICT were used. The university students recorded the highest score of 45% in the “undecided” category while the teachers college 25% and the vocational training institution 30%. This could mean that the student teachers were not making the connection between the grades and ICT use or they were not concerned with that association. ICT maintained pupils’ attention according to the majority of student teachers. The majority of student teachers therefore used ICT as a classroom behavior management strategy. Pupils’ interest in the subject increased when ICT was used and a majority also felt that ICT should be used to entertain students. A significant number of student teachers felt that ICT is primarily for use with underachieving students.

The second research question sought answers to how student teachers used ICT in planning lessons, ICT identifying requirements for a lesson, selecting ICT, and how much they understood the pedagogy associated with the use of ICT and the requirement of the teaching institution. Most students always planned to include the use of ICT when planning their lessons. When the groups were compared with regard to including ICT in their planning, the university students recorded the highest percentage total of “undecided” and “disagreed.” Most students responded that they paid attention to the ICT required for a particular lesson but when the students were asked how they selected the ICT, the majority said they used what was available.

More university students agreed that they considered the pedagogy associated with the use of ICT but there is still a significant number who did not consider the pedagogy associated with the use of ICT. A Kruskal-Wallis test compared the results which showed that the 2<sup>nd</sup> hypothesis was not true. See Tables 6 and 7. The results reveal a difference in the mean rank which rejects the null hypothesis which states that there is no difference in students planning lessons across teacher training institutions. The difference in ranking is significant represented by ( $X^2 = 1.242$ ,  $df = 2$ ,  $P = .537$ ).

**Table 6:** Pedagogy Mean Ranks

Institution	N	Mean Rank
University	36	50.21
Teachers College	33	46.45
Voc. Training Institution	30	53.65
Total	99	

**Table 7:** Test Statistics<sup>a,b</sup>

Statistics	Pedagogical Plan
Chi-Square	1.242
df	2
Asymp. Sig.	0.537

a. Kruskal Wallis Test

b. Grouping Variable: Institution

The majority of student teachers responded that they use ICT in their lesson because it is one of the teaching practice requirements. The majority of students used a particular ICT because the literature informed them, however, a significant number were undecided and disagreed that the literature informed their use of ICT. The majority of students agreed that the ICT that were available directly influenced their planning. This means that the student teachers could be planning their lessons around the available ICT at the schools which might not be the best selection for a particular lesson.

The third research question revealed that the student teachers used the multi-media projector and laptop more than any other digital technology in their classes. The PowerPoint along with the text format was the most used in their classes and the combination of them were mainly used to improve class activities. Class activities could take many forms and the giving of notes was the major one. The majority of students were able to setup and use the ICT equipment without assistance but when asked if they were able to troubleshoot ICT related problems, the majority responded “sometimes.” The majority of university and VTI student teachers selected the mixed approach to teaching using ICT while the majority of TC students selected learner centred strategy. The learner/student centred strategy is the strategy adopted by the Ministry of Education. See Figure 2 on page 110.

## QUALITATIVE FINDINGS

The introductory section of the interviews and focus groups sought to ascertain the major challenges surrounding the teaching practicum and whether those challenges affected the student teachers in any way. Two themes emerged, these were “The Schools’ Environment” and “Support Structure.” The schools’ environment

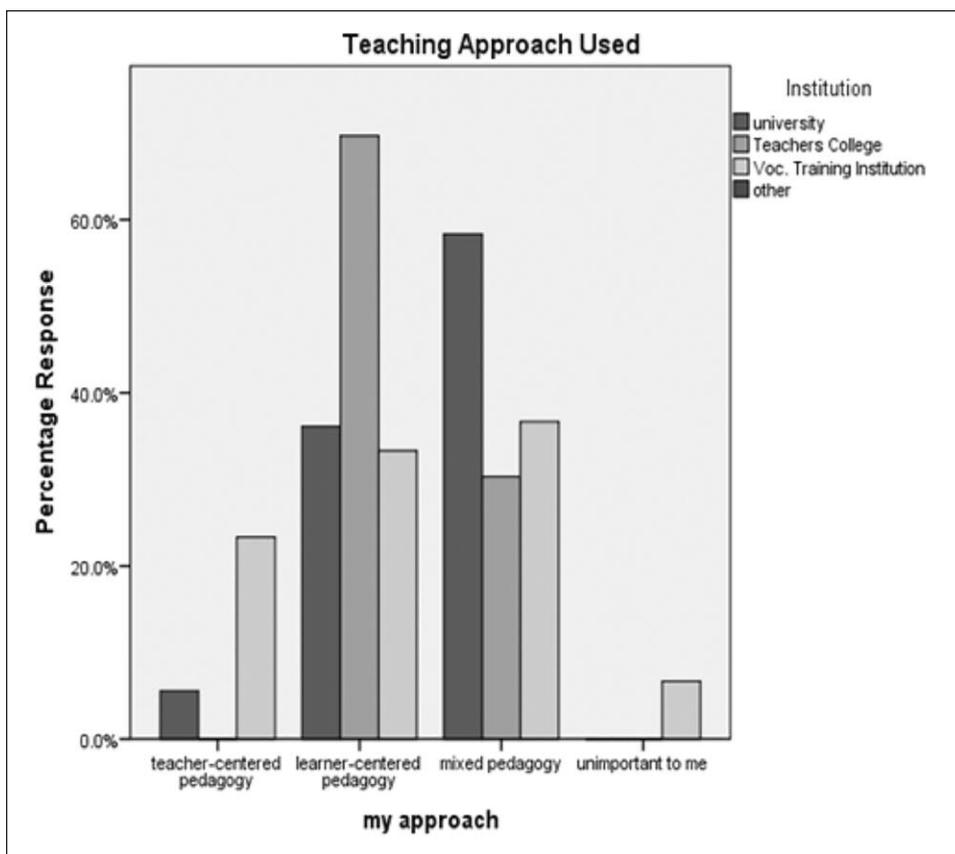


Figure 2: Teaching Approach used by Student Teachers

refers to the physical, administrative, pupils, teaching staff and the procedures and resources that the student teachers engaged with during their practicum. One student teacher from the university remarked:

For most of my lessons I had to use multimedia. However, there were limited projectors available to us. And we were unable to enter the premises with our own devices. In addition, in the computer lab some computers weren't working. There were also students without machines to work with (*Univ-Student-1*).

Support structure refers to the type of assistance that should be given to student teachers on their teaching practicum and includes the school's administration, cooperating teachers at the schools and lecturers from the teacher training institu-

tions. Students described help with lesson plans, classroom management and motivation. One student remarked:

“She (lecturer) is the type of lady who guided me a lot i.e. planning, lesson plans & classroom management strategies. At one point she came for one of my assessments and it never turned out well. She gave me the opportunity to try again” (TC-Student-3).

The theme that emerged from the first research question was *knowledge of ICT* and the subthemes were *making teaching easier, stimulating interaction among pupils, promoting learning among pupil*. One student remarked:

Using ICT made my job a lot easier. Not all the students were at their highest level in reading or writing. Using stuff like multimedia was a lot easier for them to get notes ... and helps the teacher to explain a specific area of the content if a student doesn't understand, based on seeing all the information at once on the projector (Univ-Student-2).

The second research question produced the theme *planning my lesson* and subthemes *my considerations* and *my selection*. One student remarked:

I have to consider my lesson topic, my lesson topic goes with the use of technology. In terms of my students the learner profile, some are aural, tactile and visual learner (TC-Student-2)

The third research question produced productivity tools. One student remarked:

I find that (PowerPoint) is easier to plan my lesson with. You can just put the content there and get it over with. If you want to start a discussion you could just put a question there and ask the students to read it and ask their views. It's very easy for them to take notes and start a discussion (TC-Student-4)

The qualitative analysis supported finding from the quantitative analysis.

## Discussion

The first theme relating to the schools' environment sought answers relating to the schools' ICT facilities. Student teachers described the ICT facilities as 'satisfactory' which is merely a passing grade according the Chief Inspectorate Report (2013). A total of 37.4% student teachers from the survey representing the largest percent-

age of student teachers indicated satisfactory and 18.2% indicated unsatisfactory. The items they listed in short supply were the multimedia projectors, laptops while, according to them, many of the computers in the computer labs were not working. Some student teachers listed a number of ICT tools that were available to them such as desktop computers, printers, tablets, Internet, multimedia projectors, interactive whiteboards and Microsoft Office Suite consisting of MS Word, Excel, Access and PowerPoint. The students had high praises for the schools' administration and applauded the efforts schools' administration were making to improve the situation in spite of a lack of resources. The areas that were highlighted include the extra-curricular activities which sought to improve pupil confidence and the promotion of good values and attitudes consistent with the Ministry's policies. There seems to be a contradiction between the perception of Ministry of Education (MoE) officers and the actual availability of ICT resources in the schools. Ministry officials are of the view that adequate ICT resources are available in the schools but the student teachers have reported otherwise.

The second theme relating to the support given to student teachers regarding ICT revealed that many student teachers were disappointed because they did not see any organized programmes or did not know of any ICT programme to promote the use of ICT in teaching and learning at the schools. Those students who knew about the programme at the schools were not included in any training. The survey revealed that the majority of students said 'no' and "don't know" that ICT programmes were in the schools. There are ICT programmes in the schools supported by the e-Learning Jamaica Programme but it appears that the student teachers were not included in the programmes. The students exclusion from the ICT programme in the schools could explain why the majority said 'no' or 'don't know' when asked about the ICT programme in schools.

The level of supervision the student teachers received from their supervising or cooperating teachers at the schools and the lecturers from their teacher training institutions were explored. The evaluation of the level of support they received from their cooperating teachers was mixed. Some students described excellent support from the cooperating teachers who provided all the necessary tools and material while others reported complete neglect. If students are not supervised, then errors in their teaching pedagogy will remain and the evaluation process for those students has the potential of being flawed.

When they were asked about the ICT pedagogical supervision given to them by the lecturers at their teacher training institution while on the teaching practice exer-

cise, the result was just as alarming. The survey showed that more student teachers gave 'average' scores rather than 'good' and 'excellent' scores. The main reason provided describe was because the only time they saw their lecturers was during the formal assessment and little time was spent on feedback. An explanation for such average performance as reported by the student teachers is that lecturers continue carry full-time teaching and responsibility assignments during the teaching practice exercise. Reduced teaching hours are not factored in the practicum and it is expected that the cooperating teacher would be the students' immediate contact and coach, even though coaching is done by lecturers. The results showed that there is a similar problem with the cooperating teachers at the schools and this has contributed to the level of dissatisfaction among some of the students. The need for support for teachers in training is well supported by research. According to Tezci (2011) teachers should be supported both motivationally and technically in order to make full use of ICT in the classroom. Support also came from Riedel, 2003; Brown & Warschauer, 2006 (cited in Lim, Chai & Churchill, 2011) who stated that if ICT is to be effectively promoted during the practicum, university supervisors and cooperating teachers must provide support and access to ICT.

## Research Question 1

The technological pedagogical content knowledge (TPACK) put forward by Mishra and Koehler (2006) provide a framework that is used in this study and includes content, pedagogy and technology. Using the TPACK, revealed that the students demonstrated the technological knowledge and content knowledge but failed to demonstrate the pedagogical knowledge.

The first subtheme relating to making teaching easier revealed that the overwhelming majority of students from the three institutions agreed that ICT should be used to teach business subjects especially the ones that have the potential to be boring such as Principles of Business (POB) and Office Administration (OA). The student teachers felt that business subjects that require a lot of notes is best taught using ICT because ICT can provide an easy way to disseminate notes. They also felt that business subjects and ICT go hand in hand because some of the same technologies used in classrooms are used in real businesses.

The students defined "making teaching easier" as being able to prepare their lesson plans in a shorter time, prepare teaching material that would otherwise be difficult to prepare, to assist them to promote positive attitudes in pupils and

provide opportunities for pupils to search on the Internet. Some of these results are supported by a research conducted by Wikan and Molster (2011) who found that 56% of teachers use ICT, especially learning platforms to prepare their lesson, 42% get information from the Internet and 52% ask their pupils to search on the Internet during school hours and for homework. A research conducted by Barham (2014) sought to explore teachers' attitudes towards the integration of ICT in education. The results were also similar to this study. The majority of teachers in that study had a favourable view of ICT and believed that it can enhance pupil learning, attract pupil attention, make the subject more interesting and save time during the presentation of the lessons. The quality of teaching should lead to pupil learning according to Barham (2014) and I concur that ICT in schools should be focused on students' learning. The students were asked if they used ICT as a classroom behaviour management strategy. The results revealed that student teachers in all three institutions recorded high percentages in favour of using ICT as a classroom behaviour management strategy. The learning environment that the MoE is expecting is one where pupils are actively engaged in their learning and not one in which ICT is used as classroom behaviour management strategy.

The second subtheme relating to pupils' interaction with each other was centred on the ability of ICT to promote group work and improve individual participation. Group work is a teaching strategy that promotes academic achievement and socialization (Baines, Blatchford, and Chowne 2007; Gillies 2003a, 2003b; Johnson and Johnson 2004; Summers et al. 2005 (Cited in Frykedal and Chiriac, 2011). Frykedal and Chiriac (2011) explain that when pupils interact with each other they learn to inquire, share ideas, clarify differences and construct new understandings. Though it is desirable for pupils in schools to do group work it appears that the student teachers were not utilising group work effectively and instead allowed the pupils to work in groups.

The third subtheme related to promoting learning shed light on the student teachers understandings of ICT and its relation to learning. The demonstration method according to the student teachers cater to visual learners. Included in their descriptions were the use of social media, games such as Wheel of Fortune, movies, and PowerPoint slides which included cues to aid pupils' memory and allow them to use the Internet to search for information that would improve their understandings. The majority of students agreed that pupils' grades improved. However, 40.4% of all the students were undecided. The educationalists would be disappointed to find that the use of ICT was not being linked to learning outcomes but merely

being used as a presentation tool. Barak 2006; Watson 2001; Webb and Cox 2004; Windschilt and Sahl 2002 (cited in Wikan and Molster, 2011) explained that teachers with a learner-centred and constructivist teaching style might find ICT more useful in stimulating learning than teacher-centred teachers. The results of this research suggest that a large number of student teachers selected other approaches rather than learner-centred pedagogy.

## Research Question 2

For the first subtheme, “my considerations”, student teachers described the planning that went into their lessons. They described the preparation of alternative plans in the event that the electricity failed. They considered the technology that would be used to determine if it matched the topic, they paid attention to the learning style of the pupils and whether the information given to pupils would improve their learning. The VTI students planned to use ICT in their lessons more regularly than the others. The university students paid more attention to the ICT required for a particular lesson. The VTI considered the pedagogy used to teach ICT more than the others. The majority of students agreed that they used ICT because it was one of the requirements of the teaching practicum. What do these results show? The results show that the VTI students were better prepared to use ICT in their lessons than those in the other institutions and placed greater emphasis on pedagogy.

The second subtheme relating to “my selection” provided insight into how student teachers went about selecting the ICT for their lessons. They described selecting the ICT based on what was available at the schools, the pupils’ interest, the type of graphical representation required and the type of lesson to be taught whether theory or practical. These responses suggest that students were not using the guidelines for selecting the appropriate ICT for their lessons. It appears that other factors were contributing to their selection of ICT.

## Research question 3

From the qualitative analysis emerged one major theme which was productivity tools usage. The student teachers suggested a variety of reasons for using ICT tools. Among the reasons given were the pupils’ abilities and the overall attitude to do classwork and homework. The multimedia or projector, computer along with

PowerPoint software were the most frequently used. Text was the most frequently used software attribute. The students selected 'improve class activities' as the most important use of presentation software followed by "improve learning." An analysis of the information suggests that students were mainly using the ICT resources multimedia, computers and PowerPoint to present text and picture for class activities and the giving of notes. The use of the technology in this way is underutilizing the ICT tools provided by the government and teacher trainers will have to remedy this situation.

A research conducted by Uluyol and Sahin (2016) had a similar finding regarding ICT use in the classroom. Their study found that the teachers' use of ICT in the classroom was almost entirely limited to presentation technologies utilizing graphics, animation, images and videos. They added that the use of ICT for student learning and practice was limited. Tezci (2011) reported that most pre-service teachers in Turkey used ICT as a productivity tool to complete simple tasks for example word processing programmes and presentation software. This could explain why educationalists are dissatisfied with how ICT is used in the classroom because the teacher centred approach is mainly used in the classroom.

## Conclusion

It can be concluded based on the responses from the student teachers that a number of secondary schools are lacking the resources needed for ICT to be effective and the lack of resources frustrated some student teachers' effort. The tools supplied by the governments should be used for learning but they were mainly used for teaching with little regard for evaluating learning. The support given to student teachers on their practicum needs improvement especially with regard to the cooperating teachers and their lecturers. A grade of satisfactory given to some cooperating teachers and lecturers is less than ideal for such an important programme as this. The students' responses to the first research question revealed that their understandings of ICT were mainly focussed on their role as teachers and the benefits they could gain from using them. Some students used ICT as a classroom control measure and it was used extensively in most cases as a teaching aid. The second research question revealed that students selected ICTs based on what was available at the schools and they seldom planned with the pedagogy in mind. They were largely motivated to use ICT because it was one of the requirements of the teaching practicum. The third research question revealed that the multimedia and laptop

using PowerPoint and its text features were the preferred choice for student teachers. PowerPoint has more powerful features than to present slides to pupils and give notes. The education system is encouraging pupil a centred approach to learning which would include extensive activity based learning facilitated by the constructivist approach to teaching and learning.

## Recommendations

1. There needs to be a tighter monitoring of the cooperating/supervising teachers at the schools so as to prevent a breakdown between student teachers and their supervising teachers.
2. Careful attention needs to be given to lecturers who participate in teaching practicum given the satisfactory grade assessment they received from the students. An investigation needs to be done to find the root cause of the problems that are preventing lecturers from performing their duties well.
3. There needs to be a national ICT curriculum geared towards teachers in training and should be mandatory for all institutions providing teacher training. Teacher training institutions are autonomous institutions which will lead to differences in ICT use based on the institution's philosophy of education.
4. Schools should utilize more interactive e-Learning software which promote individualized study. Interactive software will allow teachers to monitor individual student's progress and help to alleviate the type of teacher centred instructions that is current being done.
5. Teachers should receive continuous training in the delivery of ICT for learning and teaching in their area of specialization.
6. Greater collaboration between institutions are necessary to prevent competing interest over the scarce resources.
7. Schools need to take more responsibility for the students' affairs on teaching practicum and should allow them to participate in training programmes offered at the school. It should be noted that it is these same students who will be employed to the schools after completing their studies.
8. Lecturers especially those involved in the practicum exercise, should be involved in continuous training in ICT.

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# Comparative Analysis of Personal Life Choices and Leadership Work Styles of Unit Leaders in Business Teacher Education in Nigeria in use of Social Media

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## Abstract

*Based on a survey submitted to business teacher educators in 5 post-secondary educational institutions in Nigeria, unit leaders are perceived as having a capacity to lead their colleagues in their innovative efforts to enhance current instructional delivery systems. In this regard, personal lifestyle choices of unit leaders in terms of using social media and technology are generally perceived as being assimilated into their work styles and priorities for their programs. Business teacher educators perceive their unit leaders as being receptive to their ideas, willing to work with them on innovative endeavors, and exhibiting a participatory leadership work style. A discrepancy between unit leaders' personal preferences towards aspects of social media and current awareness of these preferences by business teacher educators themselves may be an inhibiting factor in advancing social media use in the classroom. This discrepancy may be evident in other teacher training programs throughout the continent of Africa, resulting in social media currently being marginally implemented. Addressing this discrepancy may result in accelerating the integration of social media use in the classroom.*

**Keywords:** educational leadership, business teacher education, instructional innovation, Social media in education

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## Introduction

In business teacher education in Nigeria, the leadership exhibited by unit leaders is important to the success of inspiring faculty to achieve to their fullest potential. It is viewed as extremely noteworthy for the improvement of individual and institutional performance. One of the priorities in Nigeria is the upgrading of teacher preparatory programs by introducing new strategies to attract undergraduate students with great potential to contribute to society as informed and skilled teachers in the classroom upon graduation, but also retaining inspiring teacher educators as role models. Our intention here is to focus on the capacity of current unit leaders or chairpersons of business teacher preparatory programs to lead their faculty in introducing innovative strategies using social media to enhance the effectiveness of their teaching.

## Conceptual Framework for Study

A few scholars conceptualize leadership as a characteristic or conduct, while other researchers consider it from the relational perspective (Northouse, 2010). In this regard, some see leadership as a process by which a leader influences a team of colleagues to attain a collective objective (Davies, Hides & Casey, 2001). From this perspective, leadership is depicted as a person enlisting the aid and support of others in the accomplishment of a common task. Thus, leadership is the act of getting another person to accomplish something you need to get done but cannot be accomplished alone.

The present study considers leadership to be a process through which a Head of Department (HOD) influences faculty subordinates to accomplish common objectives. The thinking behind leadership as a process is that to be effective, there needs to be connections and contacts between the Head of Department and a variety of subordinates in their department. In this study, for example, both the Head of Department and business teacher educators are both part of a process whereby both are considered integral parts of leadership (Hollander, 1992)

Therefore, this approach promotes leadership as an interactive process in which the leader is not confined to one person who is nominated or appointed by others but rather a role that may be assumed by each and every member of the team at some point (Simkins, 2005). The reliance upon influence implies the way leaders affect their subordinates/colleagues. Leadership occurs in teams, which means that

the group is the setting in which actual leadership takes place. It is the team format that enables leadership to actually evolve (Dimmock, & Walker, 2005). The inclusion of team collaboration also has the potential to decrease the chance of unethical leadership behaviour towards subordinates (Northouse, 2010). It is also argued by Northouse that a joint effort by both leaders and subordinates is likely to result in the achievement of a common goal. Different theorists and researchers broadly link leadership to a clearly delineated vision, organizational values, institutional culture and change. (Gunter, 2001).

The field of “educational leadership research involves analyzing the concept of leadership itself, the types and styles of leadership and their relevance to educational settings” (Briggs and Coleman, 2007, pg 27). Leadership is seen in two dimensions per Ribbins and Gunter (2002); namely, (1) research related to process – “what individual leaders do . . . why they do it . . . and with what outcomes;” and (2) the research related to leadership development – “who leaders are, why and by whom they are shaped into what they are, and how they become leaders.” The present study is situated within the first category, and it addresses what individual leaders do in terms of the process they follow.

## Literature Review

Early researchers within the academic field of leadership studies that emerged in the 1980s identified two discrete leadership workstyles at the end of a single spectrum labeled transactional and transformational leadership. The inference has been that individuals with leadership responsibility generally adopt a leadership style between these two domains, thus reflecting a hybrid version by blending elements of each into a preferred style.

### TRANSFORMATIONAL AND TRANSACTIONAL LEADERSHIP THEORETICAL PARADIGMS

Downton (1973) initially characterized two leadership workstyles that are transactional or transformational in his research on political leadership. Transactional leadership refers to an individual who concentrates on getting tasks done by using positional power and influence (Northouse, 2010). This theory is based upon the path-goal theoretical framework whereby incentives are relied upon for getting workers to perform efficiently (Grosso, 2008). The transactional leader revolves

around an exchange relationship, in which subordinates' obedience is exchanged for anticipated financial rewards (Nguni, Slegers & Denessen, 2006). In contrast, according to Burns (2007), the transformational leader inspires subordinates towards a shared vision by encouraging teamwork and self-actualization on part of followers. It is perceived as a process that increases the moral and inspiration levels among the leader and subordinates and involves feelings, principles, moralities, norms and greater purpose (Northouse, 2010). Transformational leadership is depicted by Burns (1978) as going beyond the value-for-exchange model that relies on extrinsic forms of motivation, such as job perks, to get people to perform. Based on this fundamental research, it was concluded that transformational and transactional leadership are at opposite ends of a leadership continuum.

Some researchers argued that effective leadership requires more than just a transactional activity to enhance followers' satisfaction within their jobs (House, 1971; Burns, 2007). In this regard, Burns (2007) argues that the outcomes from a transformational workstyle generally target ethical results; whereas, Bass and Avolio (2004) contended that a transactional workstyle could result in a positive, as well as a destructive effort (Grosso, 2008). The transformational leader encourages subordinates to perform better in comparison to their expectations (or what they even thought possible) and inspires them to sacrifice their personal interests for the good of the group or institution. Furthermore, transformational leadership aims to develop subordinates for the intention of change and improved performance, while at the same time attending to the goals of the leader, team and its members, and the institution. (Bass & Avolio, 2004). On the other hand, the transactional leader desires to sustain the status quo since order and the stability of the organization are priorities (Bass & Avolio, 2004). Being in control is the central characteristic of the workstyle of a transactional leader, with the leader and follower having two distinct and clearly defined different roles.

In terms of workstyle, in transformational leadership, the leader engages with followers to develop them into leaders, and this is reflective of a bottoms-up approach (whereby followers influence their leader) (Bass & Avolio, 2004). According to Bass and Riggio (2006) and Gill (2006), the following four dimensions of transformational leadership are:

1. *Charismatic Leadership or Idealized Influence*: Transformational leaders become role models for their subordinates (Nguni, Slegers & Denessen, 2006). In terms of workstyle, these leaders give importance to subordinates' needs rather than their own, develop and practice higher ethical and moral

principles, and do not use authority for their benefit (Bass and Avolio, 1994). Such charismatic or idealized leaders influence others by earning respect by having confidence in their subordinates to achieve the communicated goals, which increases the possibility of subordinates internalizing and realizing these goals (Levine, 2000).

2. *Inspirational Motivation*: In terms of workstyle, these leaders evoke the spirit of the group, communicate clear expectations which subordinates are ready to fulfill and exhibit dedication to a collective vision (Bass and Riggio, 2006). The leader is perceived as being well-informed, enlightened and responsive to arising issues and puts subordinates in more control by supporting them to meet mutually agreed upon goals (Levine, 2000). Bass (1990) maintains that an inspirational leader might not always be charismatic; however, the workstyle gives considerable attention to the personal development of followers (Levine, 2000).
3. *Intellectual Stimulation*: The workstyle of the leader attempts to enhance innovation and creativity among followers through encouraging questioning and critical reflection (Bass and Avolio, 1994). Therefore, subordinates are encouraged to challenge their own viewpoint and morals along with the leader's and the organization's philosophy (Northouse, 2010). Moreover, a participative approach to finding the solution is adopted. Creative ideas from the followers are welcomed, even if these ideas oppose the leader's views (Bass and Avolio, 1994). It is appreciated if subordinates adopt different approaches and resolve problems in their own way (Northouse, 2010).
4. *Individualized Consideration*: The workstyle of the leader here focuses upon subordinates' success and development to their highest level by means of performing the role of a mentor (Avolio, 1999). Here the leader acknowledges the personal differences of followers in terms of current competencies and aspirations. The leader creates an encouraging environment for the growth and development of followers through maintaining two-way communication, tailoring their contact with subordinates, listening to others carefully, and delegating tasks. (Bass and Avolio, 1994).

## ALTERNATE LEADERSHIP WORKSTYLES

The present study prefers the classification of Northouse's (2010), which is more widely used, as it aligns better with the focus and conceptual framework of the

study. In establishing the framework for this study, characteristics attributed to the following models for workstyles were incorporated into the data gathering instrument used in the study:

1. *Autocratic Work Style*: Richard Daft (2015) describes autocratic leadership as a process to centralize authority for generating personal power by controlling the actions and behaviors of those in an organization. This work style is reflective of transactional leadership whereby coercion is an integral part of getting others to perform.
2. *Contingent Reward/Pacesetter*: In this model there is an exchange relationship between the leader and their subordinates where particular compensation is provided to the subordinates for their loyalty (Northouse, 2010). This workstyle is also attributed to a transactional workstyle of a leader. In this regard, the transactional leader becomes a pacesetter by contracting with subordinates in which specific targets and the incentives for reaching these targets are identified. (Nguni, Slegers & Denessen, 2006).
3. *Participative Leadership*. A leader who adopts this form relies on work teams for accomplishing organizational goals. The workstyle adopted here involves subordinates buying into the process of being active for building work relationships that are positive and constructive in nature. Building consensus is an integral part of teamwork (Bass, 1999; Bass & Avolio, 1994; Bass & Steidlmeier, 1999). This workstyle is indicative of transformational leadership whereby inspiration among workers primarily comes from both colleagues in the workplace with the leader acting as a servant to the team.
4. *Visionary/Charismatic Leadership*. Burns (1978) describes this workstyle as a leader who is futuristic and can mobilize others to achieve a shared vision. This workstyle is based upon inspiring others to a cause whereby followers are motivated to work beyond their expectations to achieve something greater than what is currently apparent. This workstyle is reflective of transformational leadership whereby leadership is demonstrated at all levels of employment.
5. *Coaching/Servant Leadership*: In this model, the leader takes the position of acting as a servant for followers. Robert Greenleaf (1977) depicts this workstyle whereby the leader acts as a teacher by coaching others to perform better.
6. *Laissez-Faire Leadership*: This is characterized as non-leadership or absence of leadership, “as the French phrase [laissez-faire] implies, the laissez-faire leader takes a ‘hands-off, let-things-ride’ approach” (Northouse, 2010). Using this

workstyle, the leader is reluctant to make decisions, is not present when his/her help is required, is unable to follow up when requested and is less interested in supporting subordinates to fulfil their needs (Bass & Avolio, 1989 & 1994).

## LEADERSHIP WITHIN AN EDUCATIONAL CONTEXT

Current research suggests that the leadership workstyle selected by educational administrators is dependent on societal values, organizational culture and general patterns of behavior. For example, Dastoor, Suwannachin and Golding (2003) in the context of Thailand at the university level investigated the relationship between leadership styles and faculty job satisfaction through the transformational and transactional leadership theoretical paradigm. The findings highlight that a transformational leadership style results in a stronger relationship with the faculty's self-perceived job satisfaction, and the transactional leadership style comparatively has a lesser degree association with faculty job satisfaction.

Grosso (2008) states that the workstyles of leaders will likely vary even in different parts of the same societal context, such as an educational institution. For example, Stumpf (2003) examined chairperson's workstyle and faculty satisfaction in North Carolina (United States) at the university level utilizing the same leadership theoretical transaction-transformational theoretical paradigm. Stumpf found that the use of a transformational leadership style results in a significantly positive relationship with faculty members' job satisfaction. However, a reliance upon a contingent reward process associated with the transactional leadership style also at times results in a stronger positive relationship with faculty job satisfaction, especially when compared to management-by-exception. Therefore, aspects of both a transactional or a transformational leadership styles may have merit for inspiring BTEs to become more productive. The question here is which leadership style is more relevant to the personal and professional workstyles of current unit leaders in business teacher preparatory programs in Nigeria.

## Research Methodology

This study attempts to examine the leadership and corresponding work styles of current chairpersons/directors of business teacher preparatory programs in Nigeria. The outcomes of this study will provide insight into the capacity that current chair-

persons/directors (unit leaders) of business teacher preparatory program have for leading change in their institutions. By determining how business teacher educators (BTE) perceive the capacity of current chairpersons/directors to lead their departments, steps may be undertaken to address current issues, if any, for the purpose of creating an environment conducive to designing strategies to enhance the learning of undergraduates. The focus of the study is upon finding answers to three research questions

- RQ I: What are the primary characteristics that describe the personal/social (non-work) personality of the program leader?
- RQ2: What are the primary characteristics that describe the work personality of the program leader?
- RQ3: How do faculty perceive the capacity of their chair/director to lead innovation in terms of classroom instruction? What percentage?

#### SIGNIFICANCE OF THE RESEARCH AREA

This is a different approach to research previously conducted on leadership effectiveness, especially in the field of business teacher education at the post-secondary level. In the literature reviewed above, leadership is very important to establishing an environment for change and experimentation. In this regard, enhancing teacher productivity in schools throughout Nigeria is a continual goal of business education administrators. Using an innovative research approach, the attempt here is to gain insight into the personality of the unit head in terms of personal interests and how they may impact upon work styles and corresponding leadership roles in their units. Since perceptions of their unit heads by BTEs reflect on how relationships build or falter, they reflect reality. Therefore, the outcomes of this study will provide insight as to how and why chairpersons/directors relate to business teacher educators, what are current instructional priorities, and what is the current capacity of unit leaders and current BTEs to initiate innovative approaches to their instruction for enhancing effectiveness. The study was designed as an exploratory analysis of current perceptions of business teacher educators regarding the kind of working environment that is in place and led by current chairpersons/directors. In other words, is the leadership style of unit heads as perceived by BTEs reflective of their personal life style choices? If so, how do they compare/impact in terms of laying the foundation for leading instructional innovation?

## STUDY SAMPLE

Business teacher educators from 5 States in Nigeria were initially contacted for participation in the study. Included in the sample were 140 business teacher educators of which, 30 were situated in a university; 70, in a college of education; and 40, in polytechnics. The nomenclature for each classification of educational institution used in this study is that provided by the Ministry of Education in Nigeria.

## DATA COLLECTION METHODOLOGY

Based on the six leadership workstyles identified and described in the literature review above, a data gathering instrument was designed. In this regard, the survey instrument was part of a pilot study consisting of 15 business teachers in preparatory programs at the university level. Revisions were made as a result of this pilot study. As a result of the trial run when designing the survey, the data gathering instrument was deemed to be valid based on the content. In this regard, the survey resulted in data on identifying personal life choices of chairpersons/directors, current interests and priorities of chairpersons/directors, and general work style of program administrators. The attempt here was to compare the personal and professional work profiles of the unit head of the BTE program in Nigeria for gaining some insight as to why unit heads act the way they currently do. In this regard, one segment to the questionnaire included questions about leadership style, work priorities, and innovative capacity. Data were collected between January 2016 and February 2016.

## DATA ANALYSIS

Frequency tables were generated using Version 21 of the IBM SPSS statistical software. Frequency counts were computed along with percentage responses by each item on the survey.

Missing counts were noted in the statistical analysis. In this regard, valid percentages were referenced for analysis purposes.

*Demographics.* Of the 140 questionnaires distributed to business teacher educators, a total of 117 were returned, representing an overall return rate of 83 percent. Of those 117 survey instruments returned, 34 (or 20 percent) were received from

business teacher educators in polytechnic; 65 (or 55 percent), from colleges of education; and 18 (or 15 percent), from universities.

*Personal Personality/Social Preferences of Chairperson/Director.* In terms of having some insight as to the personal interests of their chairs when away from their institutions and work, the two most frequent non-work activities of unit heads of BTE programs were using social media (n=27) and reading a good book (n=25) (Table 1). In this regard, as indicated in Table 1, 23.1 percent of unit heads of BTE programs are perceived as noticeably using social media when off the job and 21.4 percent, reading a good book. However, 45.3 percent of those survey did not know their unit head well enough to identify the interests of their unit heads when away from the role at their institution.

**Table 1:** Perceptions by BTE of Unit Head Preferences When Not at Work

Personal Interests	Frequency	Percent	Valid Percent
Use social media to connect with friends	27	22.9	23.1
Read a good book	25	21.2	21.4
Do physical fitness training	2	1.7	1.7
Go to sporting events	4	3.4	3.4
Attend charitable events	5	4.2	4.3
Do not know	53	44.9	45.3
Other	1	.8	.9
<b>Total</b>	<b>117</b>	<b>99.2</b>	<b>100.0</b>
Missing	1	.8	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

In terms of how the kind of behavior exhibited by their unit heads when away from their work responsibilities, the three most frequently perceived personality traits of their chairs are telling stories (n=30), listening/being quiet (n=26) and telling jokes (n=20) (Table 2). In this regard, 26.3 percent of the sample perceive their unit head in personal social settings as being humorous. At the same time, another 22.8 percent are being perceived as somewhat quiet in social settings whereas 17.5 percent of unit heads were being perceived as being storytellers when interacting with others. Only 14.4 percent of those surveyed were unable to identify a particular personality of their unit heads when attending non-work social events.

Similarly, in terms of personal shopping preferences of their unit heads, the two

**Table 2:** Perceptions by BTE of Unit Head Personality at Non-Work Social Events

Social Personality	Frequency	Percent	Valid Percent
Tells Jokes/very humorous	30	25.4	26.3
Is very quiet/listens mostly	26	22.0	22.8
Tells stories	20	16.9	17.5
Likely to enter debate	12	10.2	10.5
Likely not to engage in any serious conversation	6	5.1	5.3
Do not know	17	14.4	14.9
Other	3	2.5	2.6
<b>Total</b>	<b>114</b>	<b>96.6</b>	<b>100.0</b>
Missing	4	3.4	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

most frequent retailers preferred were technology stores (n=40) and bookstores (n=39) (Table 3). These findings reflect the personal preferences of unit heads as perceived by BTE in Table 1 whereby use of social media and reading a good book are frequent choices of unit heads when outside of work responsibilities at their institutions. In this regard, 36.4 percent of unit heads were perceived by BTE as preferring to visit retailers of technology with another 35.5 percent, choosing bookstores. Going to sport retailers was a distant third with only 9.3 percent indicating this alternative of shopping for their unit heads.

**Table 3:** Perceptions by BTE of Personal Shopping Preferences of Unit Head

Retailer of Choice	Frequency	Percent	Valid Percent
Technology store	40	33.9	36.4
BookstoreSporting store	3911	33.19.3	35.510.0
Investment brokerMusic store	81	6.8.8	7.3.9
Other	11	9.3	9.9
<b>Total</b>	<b>110</b>	<b>93.2</b>	<b>100.0</b>
Missing	8	6.8	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

The three most frequent preferences related to entertainment away from the job are attending a sporting event (n=25), attending to home needs (n=20), and traveling (n=19) (Table 4). In this regard, for their entertainment, 21.6 percent perceive their unit heads as preferring to attend a sporting event; 17.2 percent, attending to home needs as a measure of entertainment; and 16.4 percent, traveling. On the other hand, 38.8 percent of the respondents did not know their unit head well enough to indicate how they perceived their personal entertaining preferences.

**Table 4:** Perceptions by BTE of Personal Entertainment Preferences of Unit Head

Entertainment Preferences	Frequency	Percent	Valid Percent
Attending a sporting event	25	21.2	21.6
Attending to home improvement/maintenance	20	16.9	17.2
Traveling	19	16.1	16.4
Attending the theatre/live	1	.8	.9
Going to an amusement park	2	1.7	1.7
Attending a concert	5	4.2	4.3
Going to dinner with friends	4	3.4	3.4
Do not know	38	32.2	32.8
Other	2	1.7	1.7
Total	116	98.3	100.0
Missing	2	1.7	
Total	118	100.0	

*Workplace Personality of Unit Heads.* In terms of the primary work style of unit heads, 55.3 percent of the respondents (n= 63) perceived their unit heads of demonstrating openness especially to new ideas from others (Table 5). Another 25.4 percent (n=29) indicated that their unit heads tended to be more agreeable when reacting to the views of others. In this regard, only 6.8 percent of unit heads (n=8) were perceived at work as being impulsive with another .8 percent (n=1) as being a traditionalist.

**Table 5:** Perceptions of BTE of the Work Personality of the Unit Head

Work Traits	Frequency	Percent	Valid Percent
Openness – willingness to embrace new experience quickly	63	53.4	55.3
Agreeableness – react to views of others Impulsive – act immediately upon new ideas	298	24.66.8	25.47.0
Extraversion – willingness to engage with others	2	1.7	1.8
Cautious – enter new experiences slowly and carefully	9	7.6	7.9
Traditionalist – draw strength by keeping to past experience	1	.8	.9
Other	2	1.7	1.8
<b>Total</b>	<b>114</b>	<b>96.6</b>	<b>100.0</b>
Missing	4	3.4	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

When engaging others in the department, 70 BTEs or 59.8 percent of survey respondents perceived their unit head as very willing to accept the advice of others with another 36 or 30.8 percent, a tendency to collaborate with others (Table 6). These perceptions related to two workstyle characteristics indicate that approximately 90 percent of the survey respondents perceived a working personality of their unit heads reflecting an environment that builds teamwork and collaborative relationships for getting things done.

In terms of the thought process utilized by their unit heads, a majority (n=60) of the respondents perceived their program leaders as adopting a logical thinking approach when making decisions. This represents 52.6 percent of the study sample (Table 7). Another 14.4 percent of the respondents (n=17) perceived their unit heads as being very practical in their approach to handling department routines. However, there were 17 respondents or 14.4 percent who were unable to categorize the thought process used by the unit heads.

**Table 6:** Perceptions of BTE of Primary Workstyle of Unit Head for Engaging Others in Department

Work Style for Engaging Others	Frequency	Percent	Valid Percent
Accept advice of others	70	59.3	59.8
Collaborates with othersDoes it himself/herself	365	30.54.2	30.84.3
Make enemies along the way	2	1.7	1.7
Sets the agenda/leads with decisiveness	4	3.4	3.4
<b>Total</b>	<b>117</b>	<b>99.2</b>	<b>100.0</b>
Missing	1	.8	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

**Table 7:** Perceived Thinking Process of Unit Head

Thinking Process	Frequency	Percent	Valid Percent
Logically	60	50.8	52.6
Practically	17	14.4	14.9
Philosophically	13	11.0	11.4
Abstractly	5	4.2	4.4
Artistically	1	.8	.9
Do not know	17	14.4	14.9
Other	1	.8	.9
<b>Total</b>	<b>114</b>	<b>96.6</b>	<b>100.0</b>
Missing	4	3.4	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

In terms of leadership style being observed by BTEs, the most frequent reported workstyle reflected that of participatory in nature. In this regard, 59 or 50.4 percent of the respondents perceived their leader as being actively engaged in seeking advice of others throughout the workday. Another 19.7 percent or 23 respondents perceived their unit heads as being visionary in scope. Only 9 or 7.7 percent perceived their unit heads as being autocratic (Table 8).

**Table 8:** Generally Observed Leadership Style of Unit Head

Leadership Style	Frequency	Percent	Valid Percent
Participatory – actively engages others for input	59	50.0	50.4
Visionary – very creative/lots of new ideas	23	19.5	19.7
Pacesetter – sets the example/tone for expectations	13	11.0	11.1
Coaching others – teaches others how to perform better	11	9.3	9.4
Autocratic – tend to make decisions arbitrarily	9	7.6	7.7
Other	2	1.7	1.7
<b>Total</b>	<b>117</b>	<b>99.2</b>	<b>100.0</b>
System	1	.8	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

*Environment for Innovation.* When asked about their personal reaction of their unit heads when they personally offer an innovative idea, 66 or 56.9 percent of the respondents indicated a personal sensation of confidence that the unit head would take them seriously (Table 9). Another 37 or 31.9 percent exhibited a feeling of being at ease during the initiation phase of their innovative idea. Only 12 respondents or about 10 percent of the respondents indicated they felt awkward (n=6), intimidated (n=4) or anxious (n=2) at that moment of proposing an innovative idea.

**Table 9:** Personal Sensation to Reactions to New Ideas by Unit Head

Personal Feelings	Frequency	Percent	Valid Percent
Confident	66	55.9	56.9
At ease	37	31.4	31.9
Awkward	6	5.1	5.2
Intimidated	4	3.4	3.4
Anxious	2	1.7	1.7
Other	1	.8	.9
<b>Total</b>	<b>116</b>	<b>98.3</b>	<b>100.0</b>
System	2	1.7	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

Using a specific list of possible innovative instructional activities to become an integral part of BTE programs, the use of blended instructional formats and social media were those most frequently identified for possible development. In this regard, 37 or 32.7 percent of the respondents perceived their unit heads as instituting blended instructional formats as a priority with 31 or 27.4 percent, enhancing social media in the classroom as an instructional tool. Only 4 respondents perceived distant online education as a priority of their unit heads currently. However, 24 or 21.2 percent of the respondents could not identify any from the list as a priority of their unit heads (Table 10).

**Table 10:** Instructional Priorities of Unit Head

Instructional Priorities	Frequency	Percent	Valid Percent
Instituting blended instructional formats	37	31.4	32.7
Enhancing the use of social media in instructional formats	31	26.3	27.4
Advancing community related learning activities/outside of classroom	13	11.0	11.5
Integrating distance online instructional formats	4	3.4	3.5
None of the above	24	20.3	21.2
Other	4	3.4	3.5
<b>Total</b>	<b>113</b>	<b>95.8</b>	<b>100.0</b>
System	5	4.2	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

When asked about their perceptions of the creative capacity of BTEs in their unit, 39 or 35.3 percent of the respondents indicated that getting daily routines and tasks done was what their unit was best at doing. However, a close 38 or 32.8 percent perceived creative potential of their peers, especially when they propose creative approaches to instructional issues. Another 22 or 19.0 percent perceived their colleagues being creative when they interact with one another, especially when integrating new technology into the classroom. Only 9 or 7.8 percent perceived BTEs maintaining the status quo in terms of the instructional methodology (Table 11).

**Table 11:** Perceived Creativity Potential of BTE

BTE Best When . . .	Frequency	Percent	Valid Percent
Getting tasks done	39	33.1	35.3
Exploring creative approaches to instructional issues	38	32.2	32.8
Encouraging co-workers to adapt new technology to their instruction	22	18.6	19.0
Maintaining the status quo in their instructional methodology	9	7.6	7.8
Finding common ground when there is conflict	5	4.2	4.3
Other	3	2.5	1.7
<b>Total</b>	<b>116</b>	<b>98.3</b>	<b>100.0</b>
System	2	1.7	
<b>Total</b>	<b>118</b>	<b>100.0</b>	

## Conclusion

It may be concluded that the personal life choices of unit heads are somewhat reflective of their interests at work as a professional BTE. For example, their personal preference for using social media is perhaps reflective of their priorities at work whereby, the use of technology and adopting innovative formats for delivering instruction in their unit are of primary interest to them. Therefore, in answering Research Question #1 relating to identifying personal characteristics of unit leaders, the three that appear to be most frequently mentioned are using social media, reading a good book, and shopping at retailers specializing in selling technology. In addition, a considerable number of unit heads are perceived during non-work social events as having personalities that reflect storytelling, humor, but also good listening skills. However, it may also be concluded that a considerable number of BTEs are not familiar with their unit leader’s personal lifestyle and their preferences when

away from the job. *This lack of awareness here appears to reflect some degree of distance between BTEs and their unit heads and could have an effect in generating trusted relationships, especially when proposing new instructional approaches.*

It may be concluded that workstyle preferences reaffirm the personal life choices of unit heads, as perceived by BTEs. In this regard, the personal life choices appear to be somewhat reflected in the workstyle adopted by the unit leader. Therefore, in answering Research Question #2 relating to work style characteristics of the unit leader, the three that are most frequently mentioned are being open-minded, willing to accept ideas of others, and utilizing a pragmatic but logical thought process when completing daily routines. The specific leadership style most perceived by BTEs was that of participatory whereby individuals feel that they are part of the decision-making process in their unit. Again, these workplace characteristics appear to be reflective of previously identified personal life choices of unit leaders, especially as related to building relationships by means of social media, reading a good book which can help in refining a logical thought process, and being a good listener which is helpful when engaging others.

In terms of spurring innovation as noted in Research Question #3, it may be concluded that unit leaders are being perceived as having considerable capacity to work with BTEs to implement instructional approaches quite different from the past. It may be concluded that unit leaders are perceived as being receptive to new considering innovative ideas from BTEs, and similarly have great interest in promoting blended forms of instruction and enhancing the use of social media as an instructional tool. It may also be concluded that the current working environment is conducive to supporting innovative efforts whereby BTEs feel confident in proposing new ideas as well as working collaboratively with their peers. Therefore, it may be concluded that there is considerable capacity on the part of both unit leaders and program BTEs to initiate change in current programs. This situation may also be reflective of other teacher training programs throughout the continent of Africa. Building more awareness of personal preferences in regards to utilization of social media between unit leaders and business teacher educators may result in accelerating the integration of social media in the classroom.

## Recommendations

To assist the process of becoming more innovative, it may be helpful if the unit leaders could connect to a greater degree with BTEs in their unit on a personal

level. With the BTEs indicating that they know very little about their unit leader's personal interests and preferences, it may be helpful for unit leaders to exhibit or display their desires more openly in an effort to generate a personal bond between themselves and their colleagues. This may be an element beneath the surface that enhance the leadership effectiveness of unit leaders. When attempting to promote innovation, working in teams collaboratively may provide an avenue for driving success. This strategy may result in developing the necessary trust and respect of each other as change can become stressful. It appears that there is already in place a feeling among constituencies that unit leaders are generally open and willing to work with subordinates. *However, taking the next step for reaffirming confidence in one another by enhancing a personal connection among each BTE in that unit may make a difference in the degree of success achieved for instituting innovative instructional approaches for delivering teacher training at post-secondary institutions.*

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# “All a wi a wan”: Incarnation, the New Physics, Ubuntu

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## Abstract

*Western dualism is an illusion. All of reality is a unity of incarnate love in the totality of reality. This oneness is found in the philosophical understanding of incarnation, the new physics and Ubuntu.*

*Humanity must understand reality in a new way. Incarnation is the unity of matter and spirit, human and divine. The philosophy of Dialectical Incarnation is the synthesis of Hegel's Dialectical Idealism and Marx's Dialectical Materialism. All of reality is a dialectical unity. Incarnation manifests itself in and through the unity and synthesis of the divine as spirit and the totality of reality as matter.*

*In quantum mechanics and its wave function theory, it has been discovered that “physical” reality must be both idea-like and matter-like. As such, the world is not as it appears. Quantum theory reveals a oneness of the universe, based on relations and interconnections. All of reality is a web of oneness. The distinctions between particulars and waves, between matter and spirit and between nature and humans, can be made conceptually, but all of reality is actually one.*

*Ubuntu is the belief in a universal bond of sharing that connects all humanity and all of reality. Ubuntu is anthropocentric, theocentric and cosmocentric. Ubuntu can be translated as human kindness, not just to other humans but also to the environment. Ubuntu is a universal truth – therefore for all people, all cultures, all times. With Western dualism demolished humanity must now have this new vision.*

**Keywords:** Incarnation, New Physics, Quantum Theory, Dialectical Method, Process Philosophy, Western dualism, Gary Zukav, Fritjof Capra, One Love, Ubuntu, African Indigenous Ethics

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## Introduction

The fact that Bob Marley’s “One Love, One Heart” song was awarded “Song of the millennium,” by BBC (One Love) is significant in that this article will describe how all of reality is a oneness of being. This oneness is incarnation. Unfortunately, much of Western philosophy has identified incarnation as being a revealed theological phenomenon, and specifically a Christian one, which is exclusively associated with the person of Jesus the Christ. The philosophy of incarnation presented here is not the theology of the Incarnation of Jesus of Nazareth; rather it is a philosophy of the dialectical “one stuff” of the totality of reality, it is the harmony of love that is human, divine and the totality of reality. The New Physics supports this interconnectedness of all reality and demonstrates that Western dualism is in fact an illusion. The world is not as it appears (Zukav 81). The world is not materially substantive in the usual sense of the word. But the world is not completely idea-like either. Humanity must understand reality in a new way. Incarnation, the New Physics and the philosophy of Ubuntu all testify that “All a wi a wan!”. Let us see how.

## Understanding the Dialectical Method and Incarnation

So as to better grasp this new vision of reality it is important to understand what is meant by “dialectic” and how a dialectical method operates, since there are a variety of meanings of both the term and the methodology. The word “dialectic” comes from the Greek word *dialektos*, meaning discourse or debate (Reese 174). Any form of dialectic begins by drawing rigorous distinctions. The origin of a formal understanding of dialectic may be appropriately attributed to Zeno of Elea, Socrates and Plato. But the manner in which “dialectic” is understood and used in this philosophy is the way it was defined by Johann Fichte and then employed by Georg Friedrich Hegel and Karl Marx (Reese 174). According to this understanding, dialectic is a process involving the triad of thesis, antithesis, and synthesis. When the synthesis is made, it becomes a new thesis, to which there is then a new antithesis, and so on. The dialectical procedure brings to light contradictions and other types of opposition not sensed before. An example of a dialectical movement is the following: thesis: humanity is one; antithesis: humanity is many; synthesis: humanity is a unity-in-diversity.

Dialectical Incarnation is a philosophy that identifies a unity found in the infinite and diverse particularities (both “idea” and “material”) of the universe, i.e., the totality of reality. This philosophy is aimed at clarifying how seemingly opposing concepts, such as spirit and matter, transcendent and immanent, divine and human, are distinct “conditions of the possibility” but are never separate in actual reality (Kant, *Pure Reason* 6). Dialectical Incarnation breaks down dualisms by indicating that such separation is merely an illusion and that all reality can now be understood as a synthesis of bi-polar concepts. All of reality is a single dialectical entity, and this single dialectical entity is incarnation. When one says that the divine and the human, that spirit and matter, are distinct but not separate, one means that one can intellectually grasp the condition, the “concept,” of each, but in actual reality one can never separate the two. That opposing entities can be “distinct but not separate” is what Aristotle had in mind when he stated that one cannot separate matter from form and form from matter (*Metaphysics* VII 3 30, VIII 2 15). Incarnation is parallel to Aristotelian substance which, as he explains, is both form and matter, distinct as conditions, as “concepts,” but never separate in reality.

Incarnation is in itself dialectical. To call this philosophy “Dialectical Incarnation” is redundant. Nevertheless, as an introduction to and explanation of incarnation, this article will continue to use this name because it serves as an indication that it is different from the Incarnation commonly associated with Christianity stated earlier.

## Recent Developments

There are numerous recent journal articles which testify to the necessity of examining the predominant tenets within the philosophy of Dialectical Incarnation. The first concern is finding a synthesis between seeming opposing poles. This is certainly addressed by Chin-Tai Kim in his article “Transcendence and Immanence.” He states that

the ideas of transcendence and immanence are not mutually exclusive but mutually determinative. All theologies and metaphysical systems that posit an ultimate reality must show its double aspect as both transcendent and immanent (537).

After defining both terms and offering a historical development and use of them, he specifies that his interest is to “raise philosophical issues – issues about the nature and possibility of, not about the fact, of incarnation” (541). He goes on to say

the notion of incarnation is paradoxical. In becoming incarnate, in assuming forms of created being, the deity becomes for itself a being other than itself; the incarnating God is identical with, and at the same time different from, the incarnated God; the eternal, infinite non-corporeal being is, and simultaneously is not, temporal, finite and corporeal . . . A dialectical interpretation of Incarnation thus seems to be the one that recommends itself the most. Hegel did not invent dialectic; he only developed a dialectical system. The idea of dialectic had prefigurations in traditions East and West (541).

With this dialectical understanding of reality Kim recognises that transcendence and immanence “are two fundamental polar modalities . . . [which] are relational notions that relate the ground with the ground of beings” (545). If we are philosophizing the nature and possibility of incarnation in the world, Kim makes it clear that the old parochial picture of philosophy as a self-sufficient comprehension of reality should be discarded . . . A maximal reflectivity of human thought, if any such is possible, must consist in a synthesis, or more modestly, an attempt at a synthesis, of fragmentary disciplinary visions (548).

It is this very synthesising of seeming opposing poles of philosophy that has evoked the philosophy of Dialectical Incarnation, which relates the ground (Nature) with the ground-of-beings, both of which are present in the totality of reality.

In the attempt to find a synthesis between seeming opposing poles another recent article proposes a “Double-Aspect Monism.” This theory proposes that the mind and the body are different components of a single neutral substance. In this metaphysics “neither mind nor body exists separately as such but instead there is only one kind of stuff with mind and body as its manifestations” (Nash 68).

Although the attempt is being made to synthesise, this theory falls short in comparison to Dialectical Incarnation, because it limits “objects” to only living bodies. Hylozoism and Quantum Physics have revealed that all matter has “mind.”<sup>1</sup> This is a form of panpsychism. Panpsychism pertains to all material objects, whereas

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<sup>1</sup> The quest for a single substance of all reality began with the understanding of the Greek word Hyle, meaning “primordial stuff.” Hyle serves as the first principle out of which the objective Universe was formed (Reese 323). . . Through the dichotomies of inorganic and organic, inanimate and animate, matter and spirit, immanent and transcendent, many of our Western philosophies have succumbed to dualism. Hylozoism breaks down a major element of this dualistic understanding. It states that all material things possess life. The inanimate/animate, inorganic/organic separation is mistaken.

dual-aspect monism applies merely to objects that are living bodies. Caroll Nash explains that in being monistic dual-aspect theory shares with idealism and materialism the attractiveness of there being only one substance which may afford it greater comprehensibility, explanatory economy and aesthetic simplicity. It may be superior to idealism in its acknowledgment of physical happenings and to materialism in its recognition of mental events (Nash 70).

Caroll Nash has offered a way to resolve the mind/body problem with a synthesis of two poles. However, as has been demonstrated, her theory is unable to include the “totality” of all reality. For Dialectical Incarnation, all the earth is incarnate and alive not just “living bodies.” With the failure of Double-Aspect Monism we must thus search for another alternative attempt in uniting our seeming opposing poles of spirit and matter.

The dualism of the Western world-view has posed significant problems, because it has fostered problematic and hierarchically arranged aspects of the world into bipolar categories, i.e., human versus nature, culture versus nature, male versus female, symbolic versus material, reason versus emotion, mind versus body, civilized versus primitive, and production versus reproduction. According to Sherrie Steiner-Aeschliman, these bimodal categories represent reifications rather than accurate depictions of reality (235).<sup>2</sup> Dualism encourages actors to favour one side of the dualism over and against the other. The denigrated categories are said to be exploited in the service of the prioritized categories and an understanding of a holistic, united reality is lost. The lop-sided nature of G. W. Hegel’s idealism and Karl Marx’s materialism remains even within dualism because one category is favoured over the other.

Although dualism can be problematic, Steiner-Aeschliman indicates that accepting monism does not resolve the problem. Simply argued, monism does not resolve the problems found in dualism and is not the sole alternative to dualism. Another world view is possible, one that incorporates monistic and essential dualistic components directly into an understanding of the cosmos and the humans who act in it.

A possible alternative is immanent dualism. By using the term “immanent” one is indicating that there is a world view that draws “attention to shared histories,

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<sup>2</sup> The pagination of this article is not exact. The hard copy was not available and the electronic copy does not have the pages.

experiences and realities” (Steiner-Aeschliman 243). In contrast to holism, which suggests a “unity of experience”, “immanent dualism is pluralistic” (Steiner-Aeschliman 243). Steiner-Aeschliman states that

[t]he purpose of describing this world view is to provide a framework for understanding patterns of organization of the world not yet adequately recognized. It describes patterns of organization as interfaces of symbolic and material processes, and suggests a basis for the societal reorganization of late industrialism in response to global environmental change (Steiner-Aeschliman 244).

When trying to grasp the meaning of immanent dualism one discovers that it is “multidimensional and may be described using a metaphor of voices” (Steiner-Aeschliman 241). If one views science as a “voice of the material world,” then religion would then be “a voice of the symbolic world” (Steiner-Aeschliman 244). Immanent dualism, similar to Dialectical Incarnation, synthesizes these two bimodal perspectives and envisions a “world view where there is constant conversation between religion and science.” In immanent dualism the two retain “their distinct voices while engaging in dialogue and interdependent integration of thought (Steiner-Aeschliman 244). Immanence suggests that “the divine and the material are self-referential, connected, united and indivisible in a creative and diverse reality,” while dualism “refers to the way in which the divine and the material are distinguishable” (Steiner-Aeschliman 244). The article continues by explaining that the unity of immanence and dualism in one world view emphasizes how dialogue between religion and science includes within a single paradigm both similarities and differences – a paradigm that lies between absolutism and relativism, insisting that the cosmos is both rationally intelligible yet inherently contingent (Barbour 1990:84). Immanent dualism is a processual and multidimensional world view (i.e., pluralistic, historical, narrative and evolving) rather than mechanistic, linear and unidimensional (Steiner-Aeschliman 244–245).<sup>3</sup>

Immanent dualism attempts to do what Dialectical Incarnation does by indicating that there are distinctions in reality, yet those distinctions are not separate. The former recognises the “similarities and differences in one world view in a manner that produces unique distinctions which cannot be made by either monism or dualism” alone (Steiner-Aeschliman 245). As immanent dualism seeks a “totalizing

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<sup>3</sup> Steiner-Aeschliman makes reference to Ian Barbour, *Religion in an Age of Science: The Gifford Lectures*. Volume 1.

world view,” it “promotes diverse development of both theology and science” while it struggles from having a lop-sided leaning toward either. “Immanent dualism promotes the complementarity rather than the compartmentalization of science and religion” (Steiner-Aeschliman 245). Compartmentalization separates science and theology against each other as polar categories in a way that they do not interact. However, [c]omplementarity brings the unique perspectives of science and religion together and “seeks to understand how both can be a faithful and consistent insight into the same reality” (Steiner-Aeschliman 245).<sup>4</sup>

Dialectical Incarnation could be called a type of “monism,” in that all of reality is one substance. It could also be called a type of “dualism,” in that it maintains the distinction between two opposing poles. However, the fact is that Dialectical Incarnation is neither a classical monism nor a classical dualism, it is a synthesis of a dialectical reality. The theory of Immanent Dualism is to be praised for its attempt in synthesising monism with dualism, but it fails because it remains a dualism. Although complementarity is operative, it separates two distinct poles. Hence, one must move on in the quest to find different perspectives in explaining and confirming the philosophy of Dialectical Incarnation.

## The New Physics

The Copenhagen Interpretation of Quantum Mechanics states that what humanity perceives to be physical reality is actually one’s cognitive construction of it. Within the purpose of breaking down the illusion of a dualistic world present in the philosophy of Dialectical Incarnation, it is worth quoting a physicist himself. Henry Stapp makes it clear.

If the attitude of quantum mechanics is correct, in the strong sense that a description of the substructure underlying experience more complete than the one it provides is not possible, then there is no substantive physical world, in the usual sense of this term. The conclusion here is not the weak conclusion that there *may* not be a substantive physical world but rather that there definitely is not a substantive physical world (Stapp *Mind, Matter* qtd. in Zukav 82).

This claim that the “physical” world is not physical was first labelled as preposterous, totally remote from experience and thus it was discarded (Zukav 82). Too,

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<sup>4</sup> Steiner-Aeschliman quotes Richard H. Bube, *Putting It All Together: Seven Patterns for Relating Science and the Christian Faith*, p. 168.

the experimental evidence itself is incompatible with our ordinary ideas about reality. But physicists are merely the newest members of a sizable group which have always held such views.

It is interesting that this new physics, and its quantum theory, has also been a significant contribution to process philosophy. The traditional understanding of an atom is based on the principle that atoms cannot be cut up or broken into smaller parts. “Atom-splitting” is, therefore, a contradiction in terms. According to this interpretation, it is here that the downfall of classical atomism was brought about by the dematerialization of physical matter in the wake of the quantum theory. Quantum theory teaches that, at the micro level, what was normally understood as a physical “thing”, is itself no more than a “statistical pattern, a stability wave in a surging sea of process” (Rescher 98). Fritjof Capra explains it as such.

At the sub-atomic level, matter does not exist with certainty at definite places but rather shows ‘tendencies to exist’, and atomic events do not occur with certainty at definite times and in definite ways, but rather show ‘tendencies to occur’. . . . All the laws of atomic physics are expressed in terms of these probabilities. We can never predict an atomic event with certainty; we can only say how likely it is to happen.

Quantum theory has thus demolished the classical concepts of solid objects and of strictly deterministic laws of nature. At the subatomic level, the solid material objects of classical physics dissolve into wave-like patterns of probabilities, and these patterns, ultimately, do not represent probabilities of things, but rather probabilities of *interconnections*. . . . Quantum theory thus reveals a basic *oneness of the universe*. It shows that we cannot decompose the world into independently existing smallest units. As we penetrate into *matter*, nature does not show us any isolated ‘basic building blocks’, but rather appears as a complicated *web of relations* between the various parts of the *whole* (Capra 68).

Quantum theory has not brought about the demise of matter, as process philosophy wants to believe. Rather, it has brought what is traditionally labelled as “matter” to a more holistic understanding. Quantum theory has shown that what we call “matter” is really more than “things” and “solid bodies.” The condition, or the concept, of matter is one aspect, and a necessary aspect, in understanding incarnation. The conditions of the possibility of spirit and matter are united as one. There is no such thing as prime matter as Aristotle testifies. Hylozoism has indicated that all matter is alive. What quantum theory is indicating is that “solid material objects” have a sense of non-material wave-like patterns. The similarity to process

philosophy is evident. The difference from Dialectical Incarnation is that process philosophy does not recognize matter in any form. Dialectical Incarnation, and quantum theory, admits of matter but understands matter in a broader, more complete perspective. Matter is spiritual and relational, not merely comprised of solid objects.<sup>5</sup>

The significance of quantum theory is that the universe is one and is based on relations and interconnections. All of reality is a web of oneness. The distinctions between particulars and waves, between matter and spirit and between nature and humans, can be made conceptually, but all of reality is actually one. This is why “particulars can be waves at the same time” and that in “atomic physics, we can never speak about nature without, at the same time, speaking about ourselves” (Capra 68-69).

When a philosophy interprets and teaches that the new physics has demolished matter, as process philosophy does, one needs to understand Albert Einstein’s (1879–1955 C.E.) theory of relativity.

Einstein’s general theory of relativity thus completely abolishes the concepts of absolute space and time. Not only are all measurements involving space and time relative; the *whole* structure of space-time depends on the distribution of *matter* in the universe (Capra 64).

The significance of the new physics for our philosophy continues in the recognition that the reality of nature and physics is dialectical, or paradoxical. Capra explains:

Every time the physicists asked nature a question in an atomic experiment, nature answered with a paradox, and the more they tried to clarify the situation, the sharper the paradoxes became. It took them a long time to accept the fact that these paradoxes belong to the intrinsic structure of atomic physics, and to realize that they arise whenever one attempts to describe atomic events in the traditional terms of physics . . . The subatomic units of matter are very abstract entities which have a dual aspect. Depending on how we look at them, they appear sometimes

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<sup>5</sup> Scholastic philosophers recognised this when dealing with the mind/body problem and the metaphysics of matter and form. Therefore, they made the distinction between what they called “spiritual matter” and “corporeal matter.” Peter John Olivi is one of the Scholastic philosophers that makes this contrast. See his *Quaestiones in secundum librum Sententiarum* (Bibliotheca Franciscana Scholastica 4–6), ed. B. Jansen (Quaracchi: Collegium S. Bonaventurae, 1922-26). See Q51 appendix, p. 146).

as particles, sometimes as waves; and this dual nature is also exhibited by light which can take the form of electromagnetic waves or of particles (66–67).

Gary Zukav continues when he explains how the nature of reality is both “idea-like” and “matter-like.” The physical aspect of reality is far from abolished. Quantum theory has given humanity a “complete description” of reality. The wave function of the new physics is a description of *physical* reality. That which the wave function describes is both “idea-like” and “matter-like” (81). The world does not appear in a manner in which the wave function of quantum theory is dematerializing physics. On the contrary, “the wave function represents something that partakes of *both* idea-like and matter-like characteristics” (80).

Alfred North Whitehead and process philosophy have attempted to demonstrate that the physical is not material. Dialectical Incarnation and quantum theory, on the other hand, state that the physical is both “matter-like” and “idea-like.” Besides confirming the dialectical nature of reality, Zukav’s explanation of the new physics also confirms that all reality is one and we cannot separate that which “appears” to be isolated entities. When describing the notion of “Development in isolation,” which is used in quantum mechanics, he explains that it is *we* that create the separation. The “isolation” is only an idealization for observational purposes of the “region of preparation” and the “region of measurement.” One may call this situation “‘isolation’, but in reality nothing is completely isolated, except, perhaps, the universe as a whole (What would it be isolated from?)” (72). When describing how this situation happens Zukav demonstrates that a “photon” seems to be isolated from the fundamental unity, but it is only appearing “isolated” because *we* are studying it. He explains.

Photons do not exist by themselves. All that exists by itself is an unbroken wholeness that presents itself to us as webs (more patterns) of relations. Individual entities are idealizations which are correlations made by us (72).

Henry Stapp goes on to elaborate that according to quantum mechanics the physical world is . . . not a structure built out of independently existing unanalyzable entities, but rather a web of relationships between elements whose meanings arise wholly from their relationships to the whole (Stapp, *S-Matrix* qtd. in Zukav 72).

Everything in the universe, including and especially humans, are actually parts of one all-encompassing organic pattern and no one part of the pattern is ever really separate from it or from each other (Zukav 48).

The new physics has supported the fact that all of reality is one, and that in that oneness there are the dialectical aspects that are matter-like and idea-like (matter and spirit) and inseparable. But there is more wisdom being discovered by the new physics that also supports Dialectical Incarnation's understanding of the Self as the centre of the universe. After centuries of trying to understand the nature of the world and its infinite horizon, scientists are still perplexed with their discoveries. "We are not sure," they tell us, "but we have accumulated evidenced which indicates that the key to understanding the universe is *you*" (Zukav 92). The distinction between the "in here" and "out there" upon which science was founded is becoming blurred. This new vision is not only different from the way scientists viewed the world three hundred years ago, it is its opposite. The new physics informs us that an observer cannot observe without altering what he or she sees. Observer and observed are interrelated in a real and fundamental sense (Zukav 92). The world is a dialectical one and the presence of the human person must be understood in its fullest.

## African Philosophy and Ubuntu

In the discovery and explanation of Ubuntu it is worthwhile to understand a broad sense of African philosophy. To make reference to an "African Philosophy" implies that there is something specific and distinguishable within a particular philosophy which gives it its identity. One speaks of European philosophy, Indian philosophy, German philosophy and so on. What makes "African Philosophy" African? It is a great challenge to be able to specify common components of African philosophy when this continent is so vast with seeming endless ethnic groups and cultures. It would seem to be more appropriate to refer to African Philosophies. Nevertheless, as one moves on in offering an expression of incarnation and Ubuntu, one will garner from the multiple positions present in the diversity of African philosophies those particular elements which support the discovery of Ubuntu as an expression of incarnation. To begin with one must examine pertinent understandings of African metaphysics or, at least, aspects of metaphysical thinking which emerge from Africa.

Metaphysical discourse in Africa is holistic in nature and within reality everything interacts with each other (Coetzee and Roux 138). "There is a principle concerning the interaction of forces, that is, between God and humankind, between different people, between humankind and animals, and between humankind and

material things” (Coetzee and Roux 138). One can recognise that reality is a totality. What is important for our philosophy is that “this system shows an almost unbreakable interrelation between God . . . the living and nature, . . . the living person takes a central place” (Coetzee and Roux 138). The human person of African philosophy is a fundamental part of nature in that the human person is a natural being. More than taking “central place” the African person sees himself or herself as the “centre of creation.”

The interactions and intercommunications between the visible created order and the invisible world of God, spirits, and ancestors are possible only through human beings, the ontological mean between beings acting above and below them . . . the human being in the African-world view is the centre of creation (Coetzee and Roux 2003 211).

Besides the centrality of the Self in African philosophy, so too, the rejection of dualism is another supporting agreement. Teffo and Roux explain that dualisms which are the stock-in-trade of Western metaphysics, such as that between the natural and the supernatural, and others such as those between matter and mind/soul/spirit, do not appear in African metaphysics (Coetzee and Roux 1998 138).

Within Dialectical Incarnation, the human person is an incarnational being comprised of an intrinsic union of matter and spirit. Likewise, African metaphysics also holds that “spiritual entities have material qualities; there is no radical or categorical difference between the spiritual and the material” (Coetzee and Roux 1998 146). Chukwudum Okolo also testifies that within African thought the Self is a “psycho-physical being, and incarnate spirit, made up of two principle elements, namely, ‘body’ and ‘soul’” (Coetzee and Roux 2003 214). The body and the soul are not seen as independent entities, but as elements of one incarnational being where body and soul are the conditions of the possibility of being human. Not only is the Self the “centre of creation” as an “incarnate” being, but the Self is also intrinsically in relation with others. It is the community which is the condition of the possibility of the individual. This is Ubuntu, the oneness of all and the interconnectedness of all. This is why “All a wi a wan”.

One last similarity needs be identified in African philosophy, i.e., the understanding of God in the world. God is not separate from the world. Together with the world, God constitutes the spatio-temporal ‘totality’ of existence...the natural-supernatural dichotomy has no place in African conceptualisation of the universe (Coetzee and Roux 1998 140).

In summary, African philosophy directs one to the philosophy of Ubuntu and incarnation for three reasons. First, African philosophy understands the Self as the centre of the universe and is intrinsically in relation with others. Secondly, it breaks down Western dualism; and, thirdly, African philosophy recognizes the oneness of God in the world. Ubuntu is the belief in a universal bond of sharing that connects all humanity. A person can only be the best he or she can be if the other becomes the best that he or she can be. Ubuntu can be translated as “human kindness.” It is an idea from the Southern African region which means literally “human-ness,” and is often translated as “humanity towards others,” Ubuntu it a universal truth – therefore for all people, all cultures, all times.

Nelson Mandela describes it as a traveller through a country would stop at a village and he didn't have to ask for food or for water. Once he stops, the people give him food, entertain him. That is one aspect of Ubuntu but it will have various aspects. Ubuntu does not mean that people should not enrich themselves. The question therefore is: Are you going to do so in order to enable the community around you to be able to improve (“Ubuntu (philosophy)”)?

Ubuntu has many aspects. It is respect, helpfulness, sharing, community, caring, trust, unselfishness. One word can mean so much for it is the essence of being human. Ubuntu speaks particularly about the fact that one cannot exist as a human being in isolation. Ubuntu speaks about our interconnectedness. One cannot be human all by oneself.

Humans think of ourselves far too frequently as just individuals, separated from one another, whereas humans are connected and what one does affects the whole world. When one does well, it spreads out; it is for the whole of humanity and beyond.

A person with Ubuntu lives one's humanity in compassion towards others. A person is a person because of other people. As J.S. Mbiti states a very foundational element of Ubuntu? “I am because we are; and since we are, therefore I am” (Okolo 2013).

Bishop Tutu goes on to comment:

A person with Ubuntu is open and available to others, affirming of others, does not feel threatened that others are able and good, for he or she has a proper self-assurance that comes from knowing that he or she belongs in a greater whole and is diminished when others are humiliated or diminished, when others are tortured or oppressed (“Ubuntu (philosophy)”).

Ubuntu is the essence of being human. A person with Ubuntu is welcoming, hospitable, warm and generous, willing to share. Such people are open and available to others, willing to be vulnerable, affirming of others, and not feeling threatened that others are able and good, for they have a proper self-assurance that comes from knowing that they belong in a greater whole. Present day Ubuntu is more than just relationships with humanity. Ubuntu “should be about how to make sense of the connection with the universe, animals, nature, and humans” (Ubuntu is about relationships).

## Conclusion

Humanity has entered into a new millennium of evolution. With one’s new vision, humanity is coming out of the cave with a mind and heart that are united with the divine and the entire cosmos. Humanity is coming to realise that the dualism of Western philosophy and of natural theology is not the paradigm to which one can now adhere. A dialectical and incarnational perspective of reality allows all to be one, in which each particular incarnational being unites with the whole by being a unique incarnation. Every particular sub-atomic neutron, to the entirety of the cosmos as a whole, is intrinsically summoned to be perfect. Each particularity has its perfection to be what it is as unique, and exists so as to be perfect in its particularity. Matter is not a mistake or a less important aspect of the whole. Matter is what is needed for reality to be. Each of the bi-polar components of reality is the condition of the possibility of incarnation. The separation found within the components of the totality of reality must end. Humanity must have eyes that can see and hearts that can love each and everything as a particularity, found in the oneness of all, which is incarnation.

It is the human person, the Self, which is the crucial and necessary link between the two, seeming opposing, bi-polar conditions of the possibility of the incarnate universe. This new “philosophy of the heart” is now understood as Ubuntu and must express itself in the totality of reality so that our world will find its perfection living out its Ubuntu.

Throughout history we humans have been afraid of humanity’s divinity. Humanity has condemned itself to an intrinsic evil condition of which humanity never actually had. It is time that we humans recognise the divine that we are, and it is time for us to allow the divine, to be the human and the Nature, that the divine, is. Let us awaken from our slumber and see that we humans are the centre of the

circumference of the dialectical One Love, One Heart found in the totality of reality. Albert Einstein reminds us of our responsibility because... [a]human being is part of the whole called by us 'universe.' We experience ourselves, our thoughts and feelings as something separate from the rest...a kind of optical delusion of consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from the prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. The true value of a human being is determined by the measure and the sense in which they have obtained liberation from the [ego]. We shall require a substantially new manner of thinking if humanity is to survive (Memorable Albert Einstein).

With these events in the history of humanity aiming us to the higher oneness of all reality, we end with the words of Wangari Maathai:

“In the course of history, there comes a time when humanity is called to shift to a new level of consciousness, to reach a higher moral ground. A time when we have to shed our fear and give hope to each other. That time is now” (Global Citizen).

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# “Under Examination”: An analysis of students’ writing errors at UTech, Ja and implications for the teaching of English.

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## Abstract

*This paper examines errors that students who sit the University of Technology, Jamaica (UTech, Ja) Proficiency Test in English (PTE) commit in their writing. It comes out of a larger study that investigates students’ overall performance on the PTE, a project driven by the continuous poor performance of students on English Language courses. The study uses a corpus of 86 essays chosen using the random stratified sampling method. The corpus is analysed within an Error Analysis (EA) framework using an EA taxonomy, which allows us to identify errors and classify them into four large groups – lexical, grammatical, discourse and ambiguous.*

*The results of the study show that the majority of errors committed by students belong to the grammatical category (55.1%), followed by those in the lexical category (31.8%). Ambiguous errors contribute 8.2% of the total, while the remaining 4.9% were discourse errors. The most common grammatical errors belong to the singular/plural, clausal, verb tense, subject/verb agreement, run-on and pronoun sub-categories. In terms of lexical errors, distortions (spelling errors) constitute the largest sub-category. Other frequently occurring lexical errors belong to the collocation, confusion of sense relations and the malapropism sub-categories. These results shed light on the specific language areas that pose the most challenge to students. This has implications for creating effective curricula to address these areas, and also reinforces the need to teach English as a Second Language (ESL) throughout the educa-*

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*tion system, as the errors committed by these students are consistent with those committed by other second language learners of English across the globe.*

**Key words:** Proficiency Test in English, Writing errors, Lexical, Grammatical, Discourse, Error Analysis, ESL, Taxonomy, UTech Jamaica

## Introduction

The example above is a sample from the work of a candidate’s production of a written task in one of the sittings of the PTE conducted annually at UTech, Ja. This student’s script contains a number of various types of errors. (Figure 1). To the outsider, this script may be considered appalling, given the number and types of errors committed; but the reality is, at UTech, Ja this type of situation seems more typical than not. This situation, however, is not unique to UTech, Ja, as authors across the Caribbean region have noted similar challenges faced by students at other tertiary institutions, starting from as early as the 1960s.

Many lecturers and other stakeholders across UTech, Ja have expressed concerns about students’ low level of proficiency in English, with particular reference to the fact that students make errors in trying to produce the language. Errors, however, are an inevitable feature of language learning (Brown, 2000; James, 2013; Richards, 2014). These errors seem to become a problem to stakeholders when they permeate students’ writing, thus posing a challenge to the university achieving its goals. The School of Humanities and Social Sciences (SHSS) has been tasked with improving the English proficiency of the university’s students, and as such, over the years, it has made various curricular changes. These changes tended to target content instead of language structure, and were based mainly on anecdotal evidence instead of empirical data. However, in order to design effective language teaching strategies,

Many persons belie <LF<sup>DISTORT</sup>> that the high unemployment rate is base <GMV<sup>TENSE</sup>> on the youths <GMN<sup>SING/PLU</sup>> not wanting to work but this is not so as many of them leave school with many CXC and cape subjects and cant <GMN<sup>APOS</sup>> get a job <GMN<sup>SING/PLU</sup>> but i think if they had a skill <GMN<sup>SING/PLU</sup>> instead of sitting as <GX<sup>CL</sup>> idling many would have the necessary to skill to go out and find a job even to go <GMV<sup>TENSE</sup>> door to door and marketing themselves. <GX<sup>CL-RUN</sup>>

**Figure 1:** Excerpt from a script of a candidate who sat the Proficiency Test in English

it becomes necessary to take a close look at the writing that is being produced by students at this level.

The prevalence of learner errors has led to errors being systematically examined by means of Error Analysis (EA). Error Analysis has been described as the process of identifying, describing and classifying deviations found in learners' production of the Second Language (Brown, 2000; Sawalmeh, 2013). The findings of EA research are used to engage language facilitators in the design, development and advancement of pedagogical practices, and in the creation of more effective teaching resources. With Jamaican language facilitators facing challenges such as those found in the sample in Figure 1, it becomes apparent that if our aim as educators is to assist students to a particular standard in English Language learning, we have to devise effective strategies which move beyond content to incorporate a focus on language structure. This assistance needs to begin with language educators understanding the nature of the challenges faced by students who are trying to produce English, and possible causes of such challenges. This is where the processes of Error Analysis would be beneficial to us.

## Overview of Error Analysis

James (2013) points out that the errors that students commit are often classified according to *modality* (level of proficiency in speaking, reading, writing and listening), *linguistic level* (pronunciation, grammar, vocabulary), *form* (omission, insertion, substitution), *type* (systematic errors/errors in competence versus occasional errors/errors in performance) and *cause* (interference, interlanguage). Error analysis (EA) is a fairly common method used to identify the types of errors committed by students in writing and this is the method employed in this research.

The EA technique has been in use since the 1960s (Corder, 1967) as a method of providing material for explaining the process of Second Language Acquisition (SLA). The labour-intensive nature of manually collecting, coding and analysing specimens of learner language, however, has been a challenge to accurate research. The incorporation of computer techniques that can electronically execute these operations, termed Computer-aided Error Analysis, (CEA) has assisted the process of error analysis by making available, in far less time, a corpus of learner language which is referred to as a Computer Learning Corpus (CLC) as explained by Dagneaux, Denness and Granger (1998). This method of Computer-aided Error Analysis is used in this study.

## RATIONALE FOR THE STUDY

It has been established by Smith, Stewart-McKoy, Henry and Hamilton (2015) that over a three-year period (2009-2011), students’ performance on the Writing tasks on the UTech, Ja PTE was sub-standard. The performance average on the Essay Writing task is 50.6% while that for the Letter/Technical writing task is 47.6%. A closer look at the breakdown of the grades for the essay, shows that when students’ results are aligned with the UTech, Ja grading scheme, the majority of the essays fall within the unsatisfactory category (p. 68). Moreover, in marking the PTE scripts, examiners observe that these students generally commit grave errors in writing activities. Anecdotal evidence suggests that a range of different errors which includes run-on sentences, sentence fragments and verb tense errors appear in students’ writing. This is somewhat in line with James’ (2013) proposal that errors having to do with tenses, prepositions and weak vocabulary are the most prevalent in students’ written assignments. With the exception of Jones-McKenzie and Orogun’s 2010 study, which highlights some of the errors in students’ work, there is no detailed account of the errors committed in students’ writing at UTech, Ja. This study seeks to fill that gap by identifying, describing and analysing students’ errors within an Error Analysis framework. Smith, Stewart-McKoy, Henry and Hamilton (2015) stress the importance of the “institutionalization of a realistic, university-wide language policy that takes a clear stance on the importance of proficiency in English and considers all the requisite factors” (p. 77). This study is another step towards establishing such a language policy.

## RESEARCH OBJECTIVES

The objectives of this study are to ascertain the types and frequency of errors that candidates who sit the PTE diagnostic test make in their written work, and to examine the implications of these for language teaching and learning.

## RESEARCH QUESTIONS

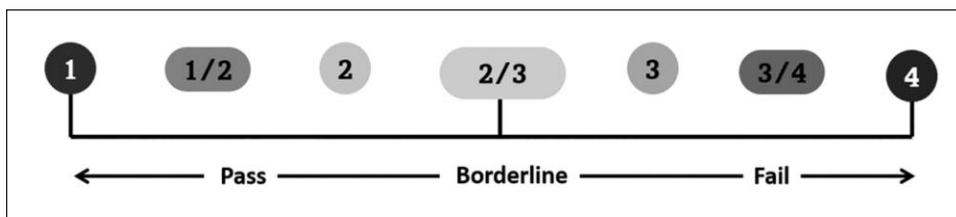
1. What is the nature of the errors made by candidates who sit the Proficiency Test in English?

## SUB-QUESTIONS

- a. What types of errors do candidates who sit the PTE commit?
  - b. What is the level of frequency of the errors committed?
  - c. In the scheme of language education, which errors are more significant?
2. What implications do these findings have for the teaching and learning of English at the tertiary level?

## Methodology

This study utilises a quantitative research approach. Candidates who sit the PTE are required to complete two (2) writing tasks; an essay of approximately three hundred and fifty (350) words and another writing task of approximately one hundred and fifty (150) words. The essay carries more significance in determining students' final results, and based on this, it is selected as the focus task for the EA. Students are given four (4) topics from which to choose one (1) and the essay is graded using a 7-point grading scheme. Figure 2 presents a basic breakdown of the seven (7) grading categories.



**Figure 2:** The 7-point grading used in the PTE

Guided by two main research questions, and in keeping with the works of researchers in the field of EA, this study's research procedures comprise three main components. The process began with quantitative data collection procedures which include the collection of sample scripts and the creation of an electronic corpus and ended with the analysis and presentation of the data. Figure 3 provides a graphical representation of the research design and is followed by a discussion of the processes.

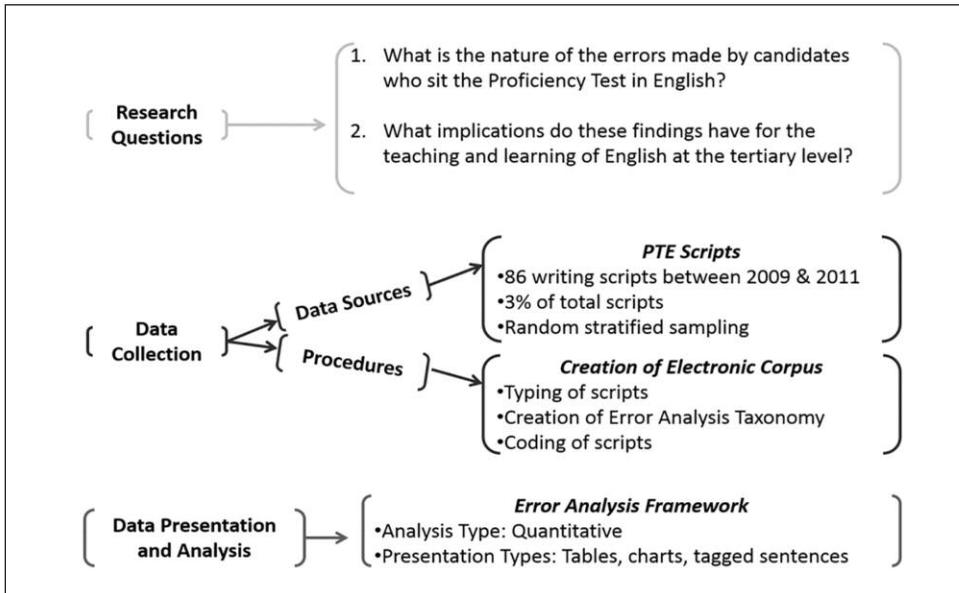


Figure 3: PTE Error analysis research design

## PROCEDURES

A total of eighty-six (86) essays were selected from a population of two thousand, five hundred and fifty-eight (2,558) scripts. This figure represents scripts from the three years under study (2009–2011). The scripts were pulled using a random stratified sampling technique based on the grade attained on the writing task. Using this strategy, the sample of eighty-six (86) scripts accounted for three per cent (3%) of the total scripts and represented the seven (7) grade levels used in the coding process. Table 1 below shows the number of scripts pulled from each grade level across the three years.

Table 1. Selection of scripts per grade level across 3 years

Actual score	Code	Total # of students	Scripts pulled
1	1	164	4
1/2	2	55	3
2	3	848	28
2/3	4	628	21
3	5	620	20
3/4	6	49	2
4	7	213	8
Total		2559	86

In order to successfully create the electronic corpus, which we used in the EA process, three rigorous phases were involved.

### PHASE ONE

In phase one, the scripts were typed using Microsoft Word (2007) so that they were computer readable. In order to ensure that the electronic scripts were exact replications of the handwritten versions, the spell-check feature of the word processing software on the computers used was disabled and all auto-correct options were deactivated. Furthermore, each typist received a typing template for inputting the data, and as a part of the research triangulation process, a sample of the typed scripts was randomly selected and checked for consistency and accuracy of the finished product.

### PHASE TWO

Phase two saw the creation of the PTE EA taxonomy. A bi-dimensional error analysis taxonomy is utilised in this study, as this type of taxonomy enables, not only the listing and description of errors, but also the classification of deviations. In creating this taxonomy, we were guided by the works of James (2013), Corder (1974) and other researchers who have established documented work in linguistic error analyses. The PTE Error Analysis Taxonomy comprised descriptions of lexical, grammatical, discourse and ambiguous errors.

We included lexical errors as one of the categories of the PTE Error Analysis Taxonomy owing to the (i) emerging central role of lexis in language study; (ii) increasing importance of vocabulary to language learning; (iii) emerging research which places lexical errors as the most frequent category of errors; (iv) significant functional load of vocabulary in early interlanguage and (v) perspective of native speakers that lexical errors are more disrupting and irritating than the other categories of errors (James, 2013; Shormani, 2014; Shalaby, Yahya and El-Komi, 2009; Mohammed, 2015). Lexical errors are described by James (2013) as those that relate to vocabulary used by writers. According to James, lexical errors reveal “the sorts of knowledge of words that people have” (p. 144). Richards (1976) explains that in “knowing” a word, there are seven (7) categories to consider. These seven (7) categories are usually divided into two (2) major sub-groups of formal and semantic errors based on their respective features.

As it relates to grammatical errors, there is a consensus among grammarians that discussions of grammar usually focus on its morphology (word structure) and its syntax (word arrangement). These two major categories therefore form the basis of the grammar section of the taxonomy. James (2013) among others, classify the major morphological errors under i) *noun morphology* (errors in marking plurality, genitive and third-person singular; ii) *verb morphology* (errors in tense formation, subject/verb agreement, and verb formation) and iii) *adjective and adverb morphology* (errors involving the confusion of adjectives and adverbs leading to incorrect usage as well as incorrect use of comparatives and superlatives).

In terms of syntactic errors, we focused on the four (4) core phrases from which errors could have been generated; i) *noun phrases*, ii) *verb phrases*, iii) *adjective phrases* and iv) *adverb phrases*. These errors are characterized by a form of omission, misselection or misuse of the noun, verb, adjective or adverb within a phrase. In addition to phrases, syntactic errors would include clausal, sentence and inter-sentence errors. *Clausal errors* include omissions of a phrase, superfluous phrasing, misordering and misselection of phrases, fragments, run-ons and faulty pronoun referencing. *Sentence errors* are a result of poor combinations of clauses into larger units, and comprise coordination errors (joining of two clauses not syntactically compatible) and subordination errors (errors in the formation of relative clauses). *Inter-sentence errors* relate to a lack of cohesion between sentences of a text, and include reference errors, errors in conjunction overuse, omission, misselection and misplacement. Figure 4 shows the sub-categories of lexical and grammatical errors.

The third category of errors that is examined in the study are discourse errors. These are global errors diffused throughout sentences or larger units of a text. There are three types of discourse errors - i) *topical coherence* errors which deals with the incorporation of discourse that is not relevant to the given topic; ii) *relational coherence* errors which relate to propositions in the discourse that do not relate to each other and iii) *sequential coherence* errors which occur when propositions are not arranged in an effective order to best illustrate the information being presented.

The final category of the taxonomy is the Ambiguous Error category, which includes classifications which did not fit within any of the aforementioned categories. The errors in this category comprise expressive errors, errors in logic and redundancy. Figure 5 shows the sub-categories of discourse and ambiguous errors.

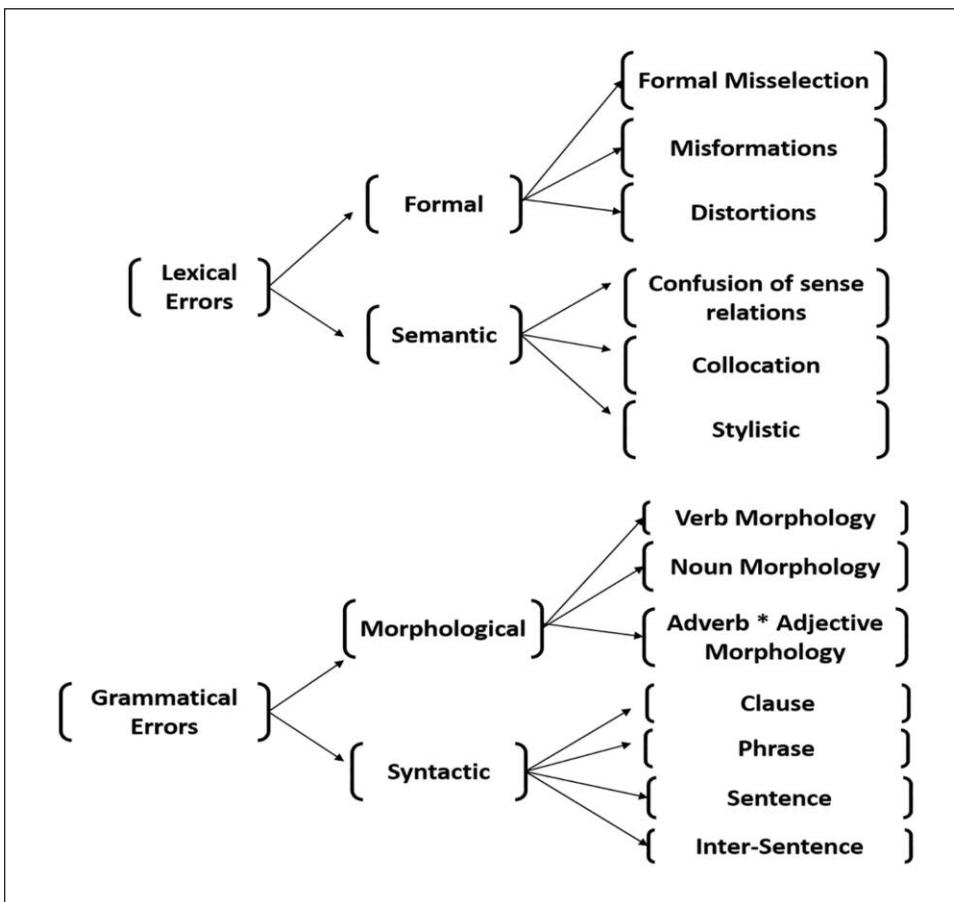


Figure 4: Sub-categories of lexical and grammatical errors

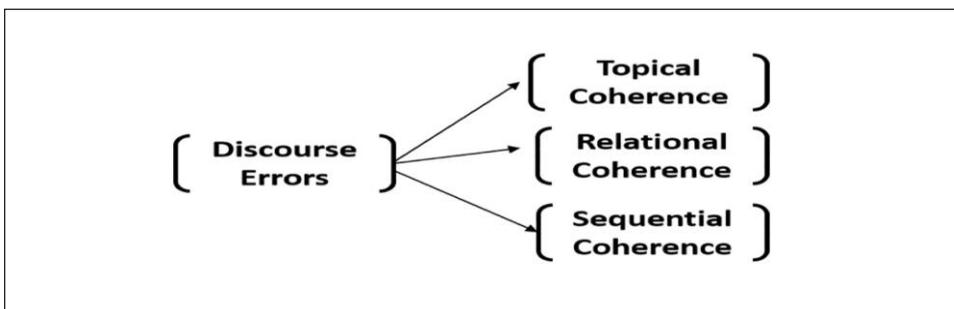


Figure 5: Sub-categories of discourse and ambiguous errors

### PHASE THREE

The final phase of the creation of the electronic corpus is the coding of the typed scripts. Six (6) third-year linguistics students from the University of the West Indies (UWI), Mona campus were selected and trained for the coding process. A process of triangulation was also applied to the coding of the scripts where coders had to submit the first three scripts of each set. This enabled us to check for consistencies and accuracies. The coded scripts were then combined into one electronic file, thus creating the general corpus. In order to facilitate the analysis of data by grade levels, seven (7) additional mini corpora, one for each grade/PTE scoring level, were created from the general corpus.

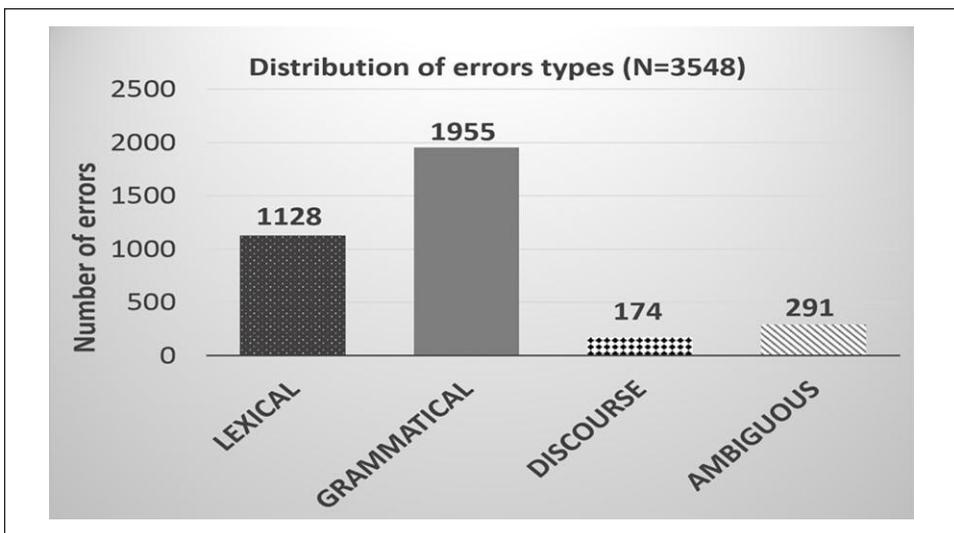
### Ethical considerations

To preserve the privacy of the eighty-six (86) candidates whose scripts were sampled, a contract, which included a non-disclosure clause, was drafted and signed by each typist and coder. The supervised typing of the scripts was done on designated university computers, between the hours of nine in the morning (9 am) and four in the evening (4 pm) until the typing process was completed. Each completed set was stored in a password-protected folder on the computers used for typing. The scripts that were assigned to the coders did not have any identifying information for the students, excepting their ID numbers.

### RESULTS

This section addresses the first two sub-questions of the first research question, that is what types of errors do candidates who sit the PTE commit and what is the level of frequency of the errors committed? The eighty-six (86) scripts used in this research account for a total of 1,334 sentences. Of this number, 1,2016 sentences or 91% contain one or more errors. The remaining one hundred and eighteen (118) sentences or 9% are error-free. The data findings reveal that on average, each script contains approximately forty-one (41) errors.

The total number of errors recorded in the general corpus is 3,548. Of this number, grammatical errors account for 1,955 or 55.1%. This is followed by lexical errors with a total of 1,128 or 31.8%. The number of discourse and ambiguous errors are minimal when compared to the other two types, with discourse errors



**Figure6:** General distribution of error types

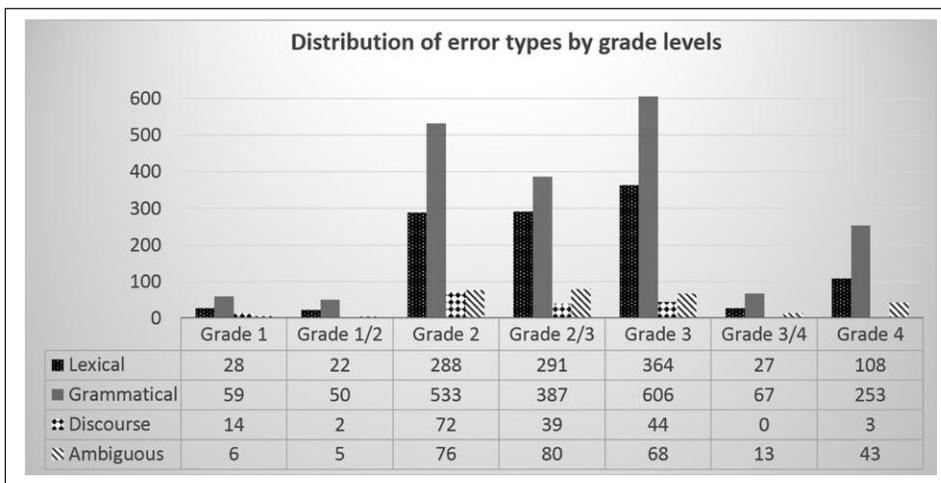
accounting for 174 instances (4.9%) and ambiguous errors representing 291 (8.2%). Figure 6 illustrates the general distribution of error types.

A closer examination of the sentence-error distribution by grade levels shows that students receiving grades 1 and 1/2 commit close to thirty (30) errors on their scripts. For participants who receive grades 2 and 2/3, their scripts, on average, have close to forty (40) errors each. The candidates who fall in the 3, 3/4 and 4 grade categories each commit more than fifty (50) errors on their scripts. This distribution is presented in Table 2.

**Table 2.** Distribution of scripts, sentences and errors (Averages are rounded off)

Grade level	Total # of scripts	Total # of sentences	Total # of errors	Average sentences per script	Average errors per script
1	4	59	107	15	27
1/2	3	49	79	16	26
2	28	459	969	16	35
2/3	21	286	797	14	38
3	20	307	1082	15	54
3/4	2	33	107	17	54
4	8	141	407	18	51
<b>Total</b>	<b>86</b>	<b>1334</b>	<b>3548</b>	<b>16</b>	<b>41</b>

The majority of all error types cluster around grades 2, 2/3 and 3. The grade 4 scripts also have a high incidence of grammatical, lexical and ambiguous errors. The distribution of the four categories of errors according to grade levels is displayed in figure 7.

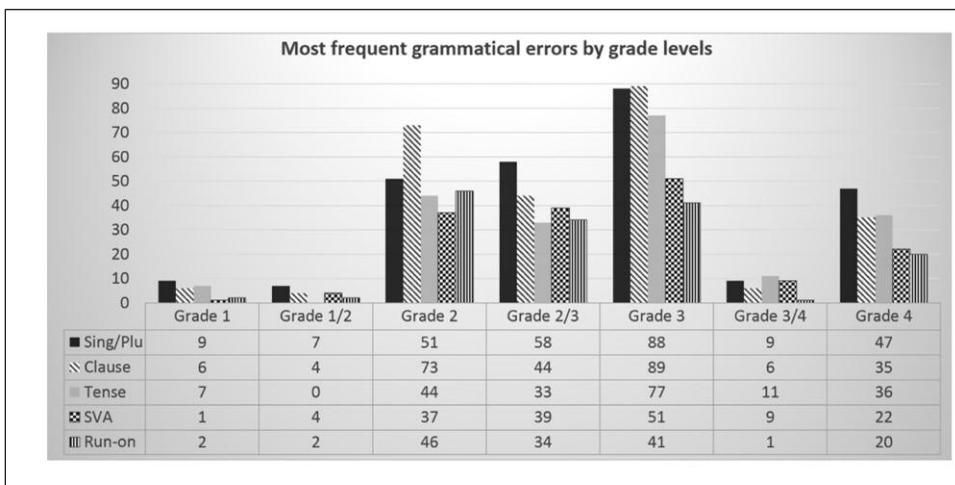


**Figure 7:** Distribution of error types by grade levels

An exploration of the relationship between the types and frequency of the top five (5) grammatical errors committed and the different grade levels, reveals similar frequency patterns as the overall results. For the top five recurring errors, the candidates receiving grade 3 record the largest numbers in all error types (88, 89, 77 and 51 respectively) except in run-on errors. Those receiving grade 2 record the highest number of run-on errors (46). Consider figure 8 below.

In examining the average number of each of the top five grammatical errors by grade level, those who receive grades at the higher end of the grading scale (Grades 1, 1/2 and 2), commit between zero (0) and two (2) errors on their scripts. Conversely, those who perform at the lower end of the grading scale, commit three (3) to six (6) of each type of grammatical errors on their scripts.

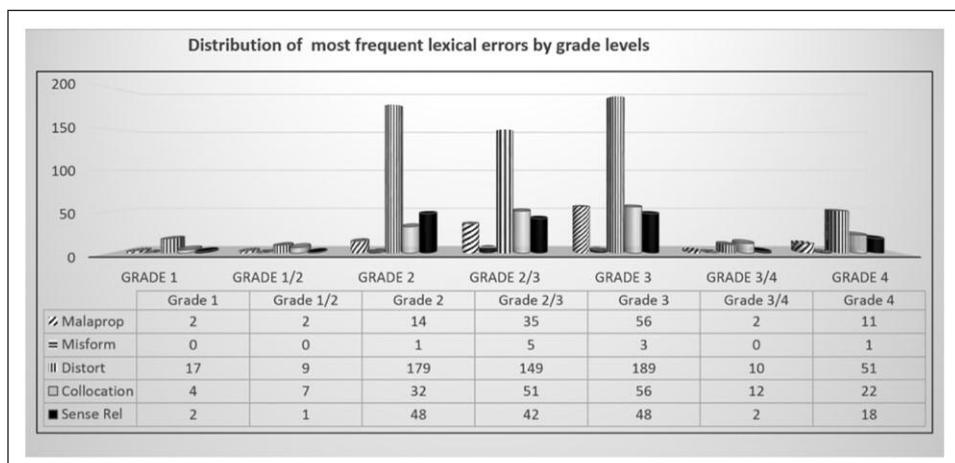
When we consider the lexical errors, distortion errors (spelling errors) are most frequent (604), followed by errors of collocation (184), confusion of sense relations (161) and malapropisms (122). Stylistic errors (47) and misformations (10) do not occur as frequently throughout the candidates’ scripts. A more detailed examination of the lexical errors committed at the different grade levels, shows that the candi-



**Figure 8:** Frequency of grammatical errors by grade levels

dates receiving grade 3 record the largest number of distortion (spelling), misselection (malapropism), errors in collocation and confusion of sense relations. Those receiving grade 2 make the highest number of stylistic errors and those deemed “borderline” (2/3), record the largest number of misformations. A breakdown of the lexical errors by grade level is presented in Figure 9.

In documenting the average number of lexical errors in each grade level, those at the higher end of the scale (grades 1 and 1/2), commit between zero (0) and two (2) error types with the exception of distortion errors. Candidates in the other grade



**Figure 9:** Lexical errors committed by grade levels

levels (2/3, 3, 3/4 and 4), have difficulties relating to spelling (distortions), misselection (malapropisms), sense relations and collocation, with averages ranging from five (5) to twelve (12) errors.

In contrast to the high frequency of grammatical and lexical errors, only one hundred and seventy-four (174) discourse errors or 4.9% of the total language deviations are recorded in the general corpus. Of this number, those receiving grades 2, 2/3 and 3 total 159 with each level recording 72, 39 and 44 errors respectively. The other grade levels together account for the remaining fifteen (15) discourse errors. Of the three (3) discourse error types, sequential coherence errors are committed most (126 occurrences). Errors dealing with relational coherence have forty (40) occurrences, while errors relating to topical coherence are minimal with a total of eight (8) occurrences across all grade levels. The distribution of discourse errors according to grade level can be seen in Figure 10.

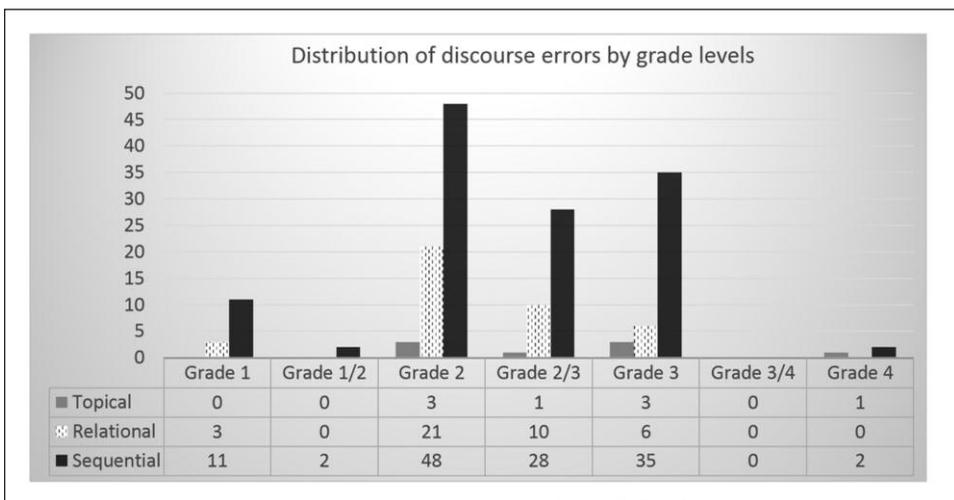


Figure 10: Discourse error types by grade levels

Like discourse errors, ambiguous errors are also low in frequency. Two hundred and ninety-one (291) ambiguous errors (8.2% of the total deviations) are logged in the general corpus. Of this number, those receiving grades 2, 2/3, 3 and 4 total 267 with each level recording 76, 80, 68 and 43 errors respectively. The other grade levels together account for the remaining 24 ambiguous errors. The distribution according to grade level is presented in Figure 11. Of the three (3) categories of ambiguous errors, expression errors are committed most (137 recorded occur-

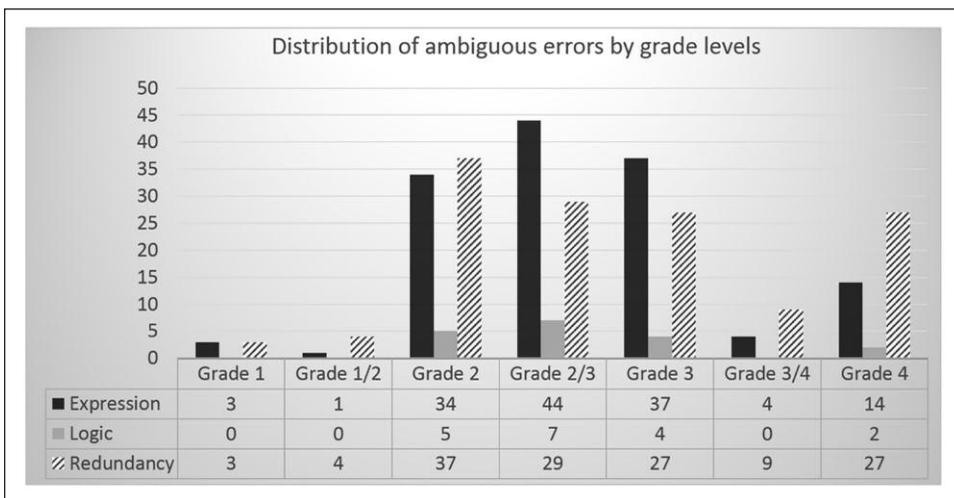


Figure 11: Types of ambiguous errors by grade level

rences), followed closely by redundancy errors with a tally of 136. Errors in logic amount to eighteen (18) errors.

Using the mean values of errors, the fifteen 1 most common errors that students commit in their writing of the essay were in *Spelling* (7.02), *Singular/Plural form* (3.12), *Clausal Constructions* (2.98), *Verb Tense form* (2.41), *Collocation* (2.13), *Subject-Verb Agreement form* (1.89), *Confusion of Sense Relations* (1.87), *Run-on Sentence Construction* (1.69), *Pronoun referencing* (1.60), *Expression* (1.59), *Redundancy* (1.58), *Sequential Coherence* (1.46), *Referencing* (1.44), *Noun Phrase Construction* and *Malapropism* (1.41), and *Prepositional Selection* (1.32). The remaining seventeen (17) errors are grouped under the label “Other Errors” and together account for a mean score of 6.24. See Table 3 for details.

These errors along with examples of their occurrence in the corpus are presented in Table 4.

**Table 3.** Most common errors committed

Item #	Error Sub-category	Frequency	Percentage (%)	Mean
1.	Distortion (Spelling)	604	17.0	7.02
2.	Singular/plural	269	7.6	3.12
3.	Clause	257	7.2	2.98
4.	Verb Tense	208	5.9	2.41
5.	Collocation	184	5.2	2.13
6.	Subject/Verb Agreement	163	4.6	1.89
7.	Confusion of Sense Relation	161	4.5	1.87
8.	Run-on sentence	146	4.2	1.69
9.	Pronoun	138	3.9	1.60
10.	Expression	137	3.9	1.59
11.	Redundancy	136	3.8	1.58
12.	Sequential Coherence	126	3.6	1.46
13.	Referencing	124	3.5	1.44
14.	Noun Phrase	122	3.4	1.41
	Malapropism	122	3.4	1.41
15.	Preposition	114	3.2	1.32
	Other Errors	537	15.1	6.24
	<b>Total</b>	<b>3548</b>	<b>100.0</b>	

**Table 4:** Most common errors and examples

Error sub-category and explanation	Sample student error <sup>iii</sup> from Corpus	Proposed correct versions of the sentences
<b>Distortion (Spelling)</b> <i>Includes misspelling which takes place through omission, overinclusion, misselection, misordering and blending</i>	1. Men usually take advantage of these girls seeking comfort and <b>assilum</b> <L <sup>F</sup> DISTORT>. 2. Also <A <sup>REDUN</sup> >the quality of our food, water and, the air we <b>brethe</b> <L <sup>F</sup> DISTORT> would get better over time....	1. Men usually take advantage of these girls seeking comfort and <b>asylum</b> . 2. Additionally, the quality of our food, water and, the air we <b>breathe</b> would get better over time.....
<b>Singular/plural</b> <i>Includes singular noun that should be plural, plural noun that should be singular; incorrectly formed plural and uncountable noun used with plural marker</i>	1. These persons face a lot of challenges because of these <DREL>untimely <b>incidence</b> <GMN <sup>SING/PLU</sup> > 2. Some <b>violences</b> <GMN <sup>SING/PLU</sup> > caused <LS <sup>COLL</sup> > in society<GX <sup>CL</sup> > are related to drug use.	1. These persons ..... these untimely <b>incidences</b> . 2. Some violent acts committed in the society are related to drug use.
<b>Clause</b> <i>The deviance occurs when there is omission, superfluity, misorder and misselection</i>	1. Time and <GX <sup>CL</sup> >again we hear reports of the Amazon being destroyed.... 2. causes <LS <sup>COLL</sup> >that leads <GMV <sup>SVA</sup> >to the performance in academics ... individuals have a hard time <b>to achieve</b> <GX <sup>CL</sup> > good academics<A <sup>EXP</sup> >.	1. Time and <b>time</b> again we hear reports of the Amazon being destroyed.... 2. individuals have a hard time <b>achieving</b> .....
<b>Verb Tense</b> <i>Using the wrong tense</i>	1. The overall trend shows that there were more full time students <b>attend</b> <GMV <sup>TENSE</sup> > the university for the period 1996 – 2006. 2. This assistance that is <b>render</b> <GMV <sup>TENSE</sup> > to these boys .....	1. The overall trend shows that there were more full time students <b>attending</b> the university for the period ... 2. This assistance that is <b>rendered</b> to these boys ...
<b>Collocation</b> <i>A word or phrase that is used together with another word or phrase that does not sound natural and correct to a native speaker.</i>	1. Another effect of skin bleaching is that it open <GMV <sup>SVA</sup> >the pours<LF <sup>MALAPROP</sup> > leaving it <b>superb</b> <LS <sup>COLL</sup> >to infections.... 2. some parents got <GMV <sup>TENSE</sup> >discouraged and confused, especially if they can't find a place nearby that would make <b>conveying</b> <LS <sup>COLL</sup> > easier.....	1. Another effect of skin bleaching is that it opens the pores leaving the skin <b>prone</b> to infections.... 2. especially if they can't find a place nearby that would make <b>commuting</b> easier.....

Table 4 continues

**Table 4:** Most common errors and examples (*cont’d*)

Error sub-category and explanation	Sample student error <sup>iii</sup> from Corpus	Proposed correct versions of the sentences
<p><b>Subject/Verb Agreement</b> <i>The subject and the verb do not agree in number.</i></p>	<p>1. One of the challenges that a dropout <b>face</b> &lt;GMV<sup>SVA</sup>&gt; is unemployment. 2. The internet was create &lt;GMV<sup>TENSE</sup>&gt; to promote and enhance globalization and connection but instead people <b>uses</b> &lt;GMV<sup>SVA</sup>&gt; the internet to ....</p>	<p>1. One of the challenges that a dropout <b>faces</b> is that of unemployment. 2. The internet was created to promote and enhance globalization and connection but instead people <b>use</b> the internet to ....</p>
<p><b>Confusion of Sense Relation</b> <i>Involves errors having to do with concepts and their relations in lexical fields and includes using a general term where a more specific term is needed; using a specific term where a more general term is needed or using a wrong near synonym.</i></p>	<p>1. .... the government &lt;LF<sup>DIS-TORT</sup>&gt; would have <b>less</b> &lt;LS<sup>CON</sup>&gt; accidents ..... have a smaller <b>amount</b> &lt;LS<sup>CON</sup>&gt;of death &lt;GMN<sup>SING/PLU</sup>&gt;.... 2. The <b>popularity</b> &lt;LS<sup>CON</sup>&gt; of drug use as &lt;LF<sup>MALAPROP</sup>&gt; become the norm that the adverse effects are obliged &lt;LS<sup>COLL</sup>&gt; by the consumers.</p>	<p>1. .... the government would have <b>fewer</b> accidents ..... have a smaller <b>number</b> of deaths ... 2. The <b>prevalence</b> of drug use has become the norm that the adverse effects .....</p>
<p><b>Run-on sentence</b> <i>The joining of two independent clauses without punctuation or the appropriate conjunction</i></p>	<p>1. In today’s society there are many children plaguing &lt;LS<sup>COLL</sup>&gt; the streets &lt;GX<sup>CL-RUN</sup>&gt;these children in particular &lt;D<sup>REL</sup>&gt; are street boys. 2. Out of team work, one learns a great deal, as each member shares their opinions, and ideas, everyone would have learnt something, an idea, or a process that they might not have known.&lt;GX<sup>CL-RUN</sup>&gt;</p>	<p>1. In today’s society there are many children roaming the streets. These children are street boys. 2. Out of team work, one learns a great deal, as each member shares his opinions, and ideas. Everyone would have learnt something, an idea, or a process that he might not have known before.</p>
<p><b>Pronoun</b> <i>Using incorrect pronouns with their corresponding nouns.</i></p>	<p>1. When a person becomes a highschool dropout <b>they</b> &lt;GX<sup>PRO</sup>&gt;are ridiculed. 2. Some students may find a job which pays extremely well but want &lt;GMV<sup>SVA</sup>&gt;to further <b>his/her</b> &lt;GX<sup>PRO</sup>&gt; studies .....</p>	<p>1. When a person becomes a high-school dropout <b>he/she is</b> ridiculed. 2. Some students may find a job which pays extremely, well but want to further <b>their</b> studies....</p>

*Table 4 continues*

**Table 4:** Most common errors and examples (*cont'd*)

Error sub-category and explanation	Sample student error <sup>iii</sup> from Corpus	Proposed correct versions of the sentences
<p><b>Expression</b> <i>Clumsy constructions in expressing ideas.</i></p>	<p>1. In Jamaica teenage pregnancy is increasing at an alarming rate, from ages 12 to 17 ... &lt;A<sup>EXP</sup>&gt; 2. There is a feeling of being relieved from common day-to-day stress that is associated with life, after finishing exercising. &lt;A<sup>EXP</sup>&gt;</p>	<p>1. In Jamaica, teenage pregnancy is increasing at an alarming rate, particularly in the 12 to 17 age range. 2. After exercising, there is a sense of relief from the day-to-day stresses of life.</p>
<p><b>Redundancy</b> <i>Repetition of a word or phrase in another form.</i></p>	<p>1. ...poor choices of good nutrition &lt;LF<sup>DISTORT</sup>&gt; can lead to lethargy &lt;LF<sup>DISTORT</sup>&gt; <b>sleepyness</b>&lt;A<sup>REDUN</sup>&gt; &lt;LF<sup>DISTORT</sup>&gt; and <b>lack of strength</b> &lt;LF<sup>DISTORT</sup>&gt; &lt;A<sup>REDUN</sup>&gt; resulting in 2. ...The increase in the rate of extortion also cannot be overlooked, especially as more Jamaicans are made redundant and &lt;GX<sup>CL</sup>&gt;laid off&lt;A<sup>REDUN</sup>&gt;</p>	<p>1. . . .poor choices of good nutrition can lead to <b>lethargy</b> resulting in . . . . 2. The increase in the rate of extortion also cannot be overlooked, especially as more Jamaicans are made <b>redundant</b> and . . . .</p>
<p><b>Noun Phrase</b> <i>Errors in noun phrase constructions and include omission or misselection of articles</i></p>	<p>1. ... these are &lt;GX<sup>NP</sup>&gt;dangers of a &lt;GX<sup>NP</sup>&gt;cellular phones that the world faces today. 2. Normally &lt;GX<sup>NP</sup>&gt; majority of farming takes place in the rural areas of Jamaica.</p>	<p>1. ... these are <b>the</b> dangers of cellular phones that the world faces today. 2. Normally <b>the</b> majority of farming activities takes place in the rural areas of Jamaica.</p>
<p><b>Malapropism</b> <i>Similar lexical forms (visual similarity). Includes suffix, prefix vowel and consonant types</i></p>	<p>1. Finally another reason why people bleach is because they want to <b>enlighten</b> &lt;LF<sup>MALAPROP</sup>&gt;their skin color . . . . 2. This will <b>permit</b> &lt;LF<sup>MALAPROP</sup>&gt; them from engaging the books needed to pass . . . .</p>	<p>1. Finally another reason why people bleach is because they want to <b>lighten</b> their skin color.... 2. This will <b>prohibit</b> them from engaging . . . .</p>
<p><b>Preposition</b> <i>Misuse of prepositions</i></p>	<p>1. ...persons <b>of</b> &lt;GX<sup>PP</sup>&gt; different skills will be employed at this time for example chefs, janitors and so on. 2. As a result there was a great controversy <b>on</b> &lt;GX<sup>PP</sup>&gt; these two artistes.</p>	<p>1. ...persons <b>with</b> different skills will be employed at this time for example chefs, janitors and so on. 2. As a result there was a great controversy <b>on</b> <i>between</i> these two artistes.</p>

## Discussion

This research underscores what anecdotal evidence suggests – that students’ written production of English has several types of errors, some which severely distort the message which they are trying to produce. What the research has made clear is that students, regardless of the grade they receive on the writing task, commit large numbers of errors. From the research findings, we can deduce that students who have a higher level of language proficiency are likely to commit less “grave” errors and/or errors with less frequency. They are likely to commit more distortion (spelling errors) in the lexical category and have fewer occurrences of tense marking, number marking, fragments and run-on sentences. As it relates to students who have lower language proficiency levels, the data patterns suggest that they are likely to commit high frequencies of a wide range of errors, some of which will gravely impair communication. This reinforces that the majority of our students are struggling to produce English that is grammatically correct and effectively expresses what they are attempting to convey.

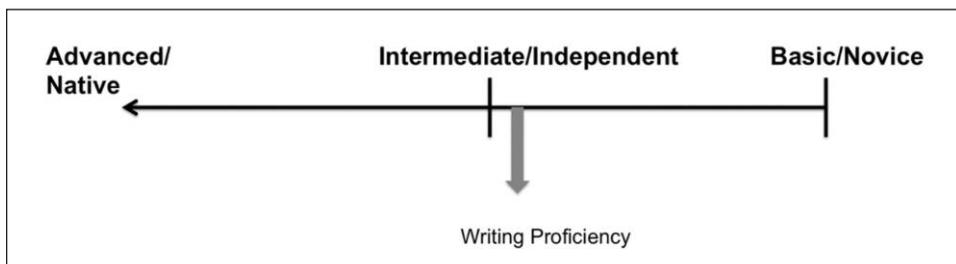
The question might be asked, *within a language education context, which errors are deemed to be more significant and as such require more remedial actions?* Historically, corrective measures have focused on grammatical errors (Aronoff & Reese-Miller, 2017; Ferris, 2011). If we closely examine, however, the errors in context, we may find justification for adjusting our perspectives and ultimately our language teaching focus. When grammatical errors are committed in the scripts, to a large extent, the likelihood of the recipient of the information comprehending the discourse is still high. The nature of the lexical errors on the other hand, suggests that these errors (especially malapropisms, errors of collocation and confusion of sense relations) increase the likelihood of misinterpretation by the receiver of the information. Grammatical errors, nevertheless, are still significant since it appears that a student who commits a number of grave grammatical errors, is more likely to commit more serious lexical errors. However, the research findings suggest that the reverse is not necessarily true.

Regardless of the fact that students’ language challenges have been noted from as early as the 1960s, it seems that not much has changed. In fact, some would argue that the English proficiency of our students has been declining over the years. Several proposals, have been put forward to address the language challenges faced by students, and at the centre of many of them, is the need to acknowledge the socio-linguistic situation in which students operate and by extension, to teach

English as a Second Language (ESL). So, why are we still struggling to get students at various levels of the educational system, particularly at the tertiary level, to produce “good” English? The answer to this question resonates within the work of McLaren, Dyche, Altidore-Brooks, Taylor and Devonish (2009), who suggest that there is a set of inherent assumptions established from as early as the inception of the first tertiary-level institution within Jamaica, which has endured to the present day.

This research provides empirical proof that university students dispel the assumptions which seem to be driving English Language education. The candidates who sit the PTE are not “English-speaking natives”, rather they are Second Language (L2) learners who, naturally, are expected to commit errors characteristic of L2 learners. However, we seem to be faced with a dire situation, as more than 3000 errors were committed from eighty-six (86) scripts recording an average of more than forty (40) errors per script. At the university level, these high occurrences of errors legitimize the concerns expressed by various stakeholders of tertiary institutions.

The analysis of students’ performance on writing tasks on the PTE reveals that the typical student’s writing proficiency, upon entering UTech, Ja. is between the Novice and Intermediate level (see figure 12), albeit, closer to the Intermediate level<sup>2</sup>. Therefore, while some students might be able to communicate with native speakers of English without difficulty, and effectively produce different types of writing, the typical student will not be able to do this.



**Figure 12:** The Writing profile of the typical UTech, Ja. Entrant

With this in mind, the following considerations need to be made by stakeholders at the tertiary level:

1. Acknowledging the severity of the English Language proficiency issue in order to set realistic goals for curriculum development and modification.

2. Revisiting and challenging the basic assumptions on which courses are designed which includes dispelling the “myth” that students at the end of the secondary level cycle have attained a high level of proficiency.
3. Intervening at the pre-tertiary levels of education in the teaching and learning of English particularly as it relates to the teaching of English as a Second Language.

## Concluding remarks

The results of this study clearly show that our students are challenged in the areas of grammatical and lexical development. These findings and their implications suggest that simply modifying curricular content is insufficient. If the aim is to move the students closer to advanced/native levels of writing proficiency, more direct focus needs to be placed on the common language students have and the appropriate strategies be implemented.

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## Endnotes

1. Example of essay topic: “Write a FORMAL essay of about 350 words on the following question. Plan your essay and support your answer with relevant examples. Write clearly and carefully, and leave yourself time to proofread at the end. You will be judged on your use of language, grammatical correctness, organization, content and style. Explain three (3) difficulties faced by any ONE of the following:
  - a. Working students
  - b. Crime fighters in Jamaica
  - c. Small business owners
  - d. Recently released prisoners
2. Sixteen errors are presented in the table as there is a tie for the 14th position
3. In sentences which have two or more coded errors, the error in question is highlighted.
4. These labels were adapted from the Inter-Agency Language Round Table Scale (ILRS) Language Proficiency Scale and American Council for the Teaching of Foreign Languages (ACTFL)

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# Journal of Arts Science and Technology

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  - Results discuss major findings according to research questions/objectives with the literature, support or refute findings, alternative interpretations, study limitations)
  - Conclusion (concluding remarks on major findings and recommendations, etc.)
- References in discipline-appropriate style
- Acknowledgements (optional)
- Appendix (optional)
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