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SAFETY BEHAVIOURAL ADAPTATION IN THE AVIATION INDUSTRY OF NIGERIA

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Abstract
Air transport, as one of the modern means of transportation is faced with some challenges. This study focused on the safety behavioral adaption in the aviation industry of Nigeria. The selected airlines were five in number operating in the Nigerian air space, the data for this study were sourced through questionnaire. A sample size of 400 was drawn using the taro yamen's formula. The simple random sampling was adopted. The study adopted the diffusion of innovations theory as the theoretical framework for the study. Some performance indicators where highlighted. The study adopted the close-ended questionnaire method and also adopted a structured four point likert-scale questionnaire to elicit information from respondents. The simple percentage was used to analyze the research questions while the chi-square was used to test the hypotheses. Result of the test of hypotheses showed that the calculated chi-square X2 103, 70 and 50 were greater than the table value of 6.25. The null hypotheses were rejected and the alternate hypotheses were accepted. Findings from the study showed that the level of compliance on air safety management is very high among the selected domestic airlines. The study recommended a periodic training and retraining of Airline staff.

Introduction

From 1909 to 1914, aviation developed from an object of curiosity into a modern fascination that gripped the popular imagination (Grant, 2004). The manufacturer of airplane is something very remarkable in the history of main kind, not just because of the size of the product, but because of what it does for man. Therefore, it can be argued that the aim of airline businesses cannot be technical prowess or innovations, or the display of sophisticated designs by manufacturers, but the need to move passenger and goods, as quickly as possible, at a cost that is reasonable, and acceptable to those who subscribe to the services and those who provide such, achieving the economic equation of passengers against operating costs. As man's quest to live a life of fulfillment remains a constant, shuttling from one place to another becomes both a means of an end, and an end by itself.

The International civil Aviation Organization (2013) in its annual report noted that the air transport system carried approximately 2.9 billion passengers in 2012, representing a 5.5 per cent increase in scheduled commercial revenue passenger kilometers (RPKs) over the previous year. In addition, it argued that today's expanding aviation system comprises multiple and interrelated systems that are geopolitically diverse, technologically complex and highly multidisciplinary.

In light of the complexity and anticipated sustained expansion of the industry, continued efforts to improve safe are essential. Historical observations have shown that accidents are normally the result of contributing factors across multiple aspect of the aviation system. ICAO initiatives such as Runway safety Programme are therefore taking a multidisciplinary approach, requiring collaboration among regulatory authorities as well as stakeholders in air traffic management, airport operations, flight operations as well as the design and manufacturing sector, recognizing that standardization is a fundamental tenet of a safe air transport system.

These observation by ICAO have challenged airline operators towards repositioning their safety needs and performance.
Today, organizations can easily change their materials, needs, goods, and services to other organization or other countries. But the only resource that is not easily exchangeable is the human. The import of this is that human resources is the most important and also the most competitive asset of any organization.
Aviation supports nearly 7 million jobs in Africa. The continent's governments have much to gain from pursuing air transport growth and connectivity. But for a region where a number of States still have safety deficiencies that pose a challenge to growth of civil aviation, improved safety is central to that goal (International Civil Aviation Organization, 2014).

Armstrong (2009) defines training as the use of systematic and planned instruction activities to promote learning. Nwachukwu (1998) is of the view that training is organizational efforts aimed at helping an employee to acquire basic skills required for the efficient execution of job/functions which he was hired. Furthermore Chand (2015) explained that training is an organized activity for increasing the technical skills of the employees to enable them to do particular jobs efficiently. In other words, training provides the workers with facility to gain technical knowledge and to learn new skills to do specific jobs. Training is equally important for the existing as well as the new employees. It enables the new employees to get acquainted worth tier jobs and also increase the job-related knowledge and skills. Training is a content-based activity, normally away from the workplace with an instructor leading and aiming to change individual behavior or attitudes (Mullins, 2010). Training is the acquisition of real knowledge that, enhances the capacity of the trainee (worker) to do his/her work with the most effective technique, thereby increasing productivity. Training is important for new or present employees and is short and an attempt to improve current or future performance (Ivancevich & Konopaske, 2013).

A major look at the problem of air mishaps in Nigeria brings to the forefront numerous factors. Lack of qualified meteorologists to forecast the weather conditions before the takeoff and landing of airplanes; operators inability to train even their critical personnel-pilots, engineers, safety practitioners (Odutola, 2006) . About 70 percent of incident/accidents are traceable to human error. Indeed, a popular adage in aviation is what is commonly referred to as Murphy's Law", which is a statement of the fact that, "if it can happen, one day it will". This means that, if anything can possibly go wrong, it will go wrong!! Being human hence not infallible, "human factors will one way or the other, impact on everything we do. Odutola (2006) further explained that Domestic Airlines in the country have been facing a lot of challenges in the course of their operations and these include high indebtedness to banks, aviation agencies and other entities, payment of charges to the various agencies, high cost of aviation fuel and absence of business model, the high cost of aviation fuel also known as JET AL, which experts say cost airlines about 40% of their income, has not only made the cost of operation high, it has also made it impossible for local airlines to break even.

A critical look at training especially as it relates to air safety performance is imperative to understanding the dynamics of air mishaps in Nigeria. This would be based on identifying critical areas that requires a holistic approach to addressing training methods and training intervals among domestic airlines in Nigeria. Given that modern aviation as a means of transport has become an extremely complex global system of interaction between human beings and machines, a system for transporting passengers and cargo around the world, the global interest in safety regulation of civil aviation is therefore not surprising (Odutola, 2013). There is no gainsaying the fact that universally accepted and implemented standards are essential for safe and efficient international air transportation. It has indeed been stressed that "without such uniform rules and procedures, aviation would at best be chaotic and at worst unsafe (Air France Magazine, 1998). Transportation by air is one of the risky challenges that have directly affected the Nigerian economy in negative ways over the years, taking the current analysis of airplane crashes across Nigeria. For this, the present study examines the influence of training on Air Safety performance vis-à-vis selected domestic airlines in Nigeria.

Statement of the Problem

Aviation is widely accepted as the safety means of transportation in some countries. However, the safety record in Nigeria is worrisome, and rightly so. The two accidents that occurred late in 2005 involving Bellview and Sosoliso Airline, accounted for over 20 percent of world-wide fatalities for the year. In the same year, Nigeria accounted for 225 out of 376 air fatalities recorded in Africa, and 9.3 percent of the total air accidents that occurred in the continent from 1996-2005. Between October 2005 and November 2006, the country witnessed five fatal air crashes that resulted in the loss of over three hundred (300) lives (Air Transport Upate, 2007).

The fear of flying is imminent, thus, prompting airlines to constantly assure and re-assure their passengers with such phrases as, "for your comfort and safety". Air safety is a core issue in the aviation industry as accident statistics fluctuate from year to year. The airline industry appreciates the fact that until it convinces people on the safety of air travel, and this fear is overcome by the greater number of people, it cannot break even. For the airlines, this is not an easy task.

"humans cannot be engineered to operate as faultlessly as machines. Airline pilots of course undergo rigorous training. They have mandatory medical-checks every six months and their flying time is limited to prevent dangerous levels of stress and fatigue building up. Yet pilot error is still held to be a contributory cause of about three quarters of air accidents. These may range from simple mistakes in reading instruments-for example flying into the ground after misreading an altimeter-to confused reactions in an emergency (Grant, 2004).

When accidents do happen, it is more often through a combination of factors than a single error or fault. The worst aviation disaster of the 20th century occurred in 1977 when two Boeing 747s, one operated by KLM and the other Pan Am collided on the ground at Tenerifer in Canary Islands, Killing 582 people. The accident happened in poor visibility. Like many airports, Tenerife had no ground radar, so aircraft on the runway could only be tracked by visual observation, but the two 747s were invisible from the control tower, as well as to one another" (Grant 2004).

Major air disasters, such as those witnessed in Nigeria in the recent past, impresses itself so intensely on the public consciousness because they happened often and were associated with painful, sudden and violent death, and as (Grant, 2004),

Major air disasters, such as those witnessed in Nigeria in the recent past, impresses itself so intensely on the public consciousness because they happened often and were associated with painful, sudden and violent death, and as Grant, (2004), rightly observed, "measures to reduce the number of air accidents and aviation related deaths may undermine the image of air travel as a normal, safe, everyday experience. The more safety procedures air passengers are subjected to, the less secure they are liely to feel. Surely, flying cannot be that safe if we are searched before boarding and flight attendants insist on telling where the oxygen masks and the emergency exists are?

Research Questions

The following research questions guided the study

1. What is the number of air mishaps in the selected domestic airlines in Nigeria?
2. To what extend is the line operation safety audit of pilots' behavior recorded in the selected domestic airlines in Nigeria?
3. How often is the operation flight data monitoring system and analysis of aircraft flight recorder monitored in the selected domestic airlines in Nigeria?
4. To what extent is the operational safety of personnel conducted during normal air traffic control in the selected domestic airlines in Nigeria?
5. What is the level of compliance on air safety management in selected domestic airlines in Nigeria?

Research Hypotheses

1. There is a significant relationship between the level of the compliance on air safety management and the number of accidents and system failures in the selected airlines in Nigeria.

Safety Performance Indicator

Safety performance indicator has been defined by ICAO (2014) as a data-based safety parameter used for monitoring and assessing performance, while safety performance target is the planned or intended objective for safety performance indicator(s) over a given period of time. Safety performance indicators are usually classified in accordance with specific features. Different classifications are commonly used in different areas. One can adopt different safety performance indicators. Below in an effective safety performance measurement indicator.

Current Challenges Facing The Aviation Industry in Nigeria (Overview)

It is a fact that during the second half of the 20th century, as air travel became popular and acceptable to the people of Europe and the Americas, it brought every region of the world within the reach of travelers faster than any other means of transport, ever known to mankind. Despite being operation it is clear that the Nigerian aviation sector is still in shambles even as Nigeria marks her 56th year as an independent nation. Stakeholders have raised concerns that at 56, the sector should have become one to be reckoned with the by countries in African given its potential to be the hub for the continent, but still lags behind in best practices and international standards.

The domestic airlines operating in the country are currently facing difficult times due to the increase in aviation fuel price, the high exchange rate that has caused many to abandon their aircrafts abroad, and the N40million debts that Hadisirika, Minister of State, Aviation, order agencies to recover.

The grounding of two of Nigeria's eight airlines, Aero Contractors and First Nation airlines within seven days, and the exit of two international airlines few months back highlight the problems of the sector. The domestic airlines were grounded on the account of having only one serviceable aircraft, a situation that fell foul of the Nigerian civil aviation regulations (Nig. CARS), which stipulates that no airline operator shall carry out schedule commercial operation with only one aircraft. However, experts and operators have pointed accusing fingers at the Nigerian civil aviation authority, (NCAA) for its failures to conduct periodic safety and financial audit on airlines as stipulated in its regulations.

Bandura (1977) demonstrated the value of modeling for acquiring novel behaviors. He expanded on the idea of how behavior is acquired, and thus built from Miller and Dollard's research. In Bandura's 1977 articles, he claimed that Social Learning Theory shows a direct correlation between a person's perceived self-efficacy and behavioral change. Self-efficacy comes from four sources. "performance accomplishments, vicarious experience, verbal persuasion, and physiological states.

Diffusion of Innovation Theory is a theory that seeks to explain how, why, and at what relate new ideas and technology spread. Everett Rogers, a professor of *communication studies*, popularized the theory in his book *Diffusion of Innovations;* the book was first published in 1962, and is now in its fifth edition (2003). Rogers (2003) argues that diffusion is the process by which an innovation is communicated over time among the participants in a social system. The origins of the diffusion of innovations theory are varied and span multiple disciplines.

Rogers proposes that four main elements influence the spread of a new idea: the innovation itself, communication channels, time, and a social system. This process relies heavily on human capital. The innovation must be widely adopted in order to self-sustain. Within the rate of adoption, there is a point at which an innovation reaches critical mass. The categories of adopters are innovators, early adopters, early majority, late majority, and laggards. Diffusion manifests itself in different ways and is highly subject of

the type of adopters and innovation-decision process. The criterion for the adopter categorization is innovativeness, defined as the degree to which an individual adopts a new idea.
Diffusion occurs through a five-step decision-making process. It occurs through a series of communication channels over a period of time among the members of a similar social system. Ryan and Gross first identified adoption as a process in 1943. Rogers five stages (steps): awareness, interest, evaluation, trail, and adoption are integral to this theory. An individual might reject an innovation at any time during or after the adoption process. Abrahamson examined this process critically by posing questions such as: How do technically inefficient innovations diffuse and what impedes technically efficient innovations from catching on?

Abrahamson makes suggestions for how organizational scientists can more comprehensively evaluate the spread of innovations. In later editions of *Diffusion of Innovations*, Rogers changes his terminology of the five stages to: knowledge, persuasion, decision, implementation, and confirmation. However, the descriptions of the categories have remained similar throughout the editions (Rogers, 1995)

Table .1 Socio-Demographic Characteristics of Respondents

Variables	Frequencies	Percentage (%)
Sex		
Male	**278**	**71**
Female	**113**	**29**
Marital Status		
Single	89	23
Married	290	74
Separated	12	3
Widow	0	0
Age		
20-29	132	34
30-39	119	30
40-49	89	23
50-59	30	8
60-69	21	5
Level of Education		
No formal	0	0
Primary	0	0
Secondary	21	5
Tertiary	370	95
Occupation		
Civil aviation	391	100
Religion		
Christianity	241	62
Traditional	0	0
Muslim	150	38

Source: Fieldwork 2019

Table 2 above shows that 278 respondents representing 7% were male, while 113 respondents representing 21% were female. The reason is based on the fact that most jobs in the aviation sector are technical in

nature. Studies have shown that males take to, and perform better in technically related fields and profession, in contrast to the female. 290 respondents representing 74% were married as the table indicated above, while 89 of respondents representing 23% are single. 12 respondent representing 3% are separated, as indicated on the table.

Respondents of various ages' cohorts participated in the study. The most common age range was 20-29 followed by 30-39 (see table). This was an indication that most of the aviation workers are young and very active. Majority of the respondents representing 95% of the population have attained the tertiary education as at the time of study. Table 3, above, also indicated that 5% of the respondents had secondary education. It is an indication that about 95% of the respondents have very good qualification. This showed the importance attached to quality education as a criterion for employment in key areas in the aviation sector. Of the respondents sampled, 100% of the respondents are aviation workers. Data retrieved also showed that 62% of the respondents were Christian while 38% of the respondents are Muslims.

Data Analysis

This discussions of finding were done to reflect the objectives raised in the study. Our intention is to see how they corroborate the works of the authors, or, whether they are in contrast with their studies and findings.

Research question 1: What are the number of air mishaps that have occurred in the selected domestic airlines in Nigeria?

Table.2: Number of air mishaps in the selected domestic airlines

Airlines	**Number of accidents**	**Remarks**
FN	0	Nil
AR	1(one) minor	
Ae	1(one) serious injury	
P	0	Nil
D	1(159 fatalities)	Serious injury

Fieldwork (2016)

An analysis of the number of air mishaps showed that D air had the highest mishap with one (1) mishap and (159) fatalities. It was followed by Ar and Ae airlines which has 1 minor mishap and Age having one serious injury. These findings especially for Dd airlines resonates the worry, challenges and litigation as reported by the Accident Investigation Bureau of (2012), that a consortium of foreign and Nigerian lawyer, representing 26 families, who lost their loved ones in the 2012 crash in which more than 150 passengers were killed in the crash along with six crew members and members of the public on the ground, said the failure of the AIB to release the final report on the crash has prevented them from achieving closure fours years after the tragedy.

Research Question 2: To what extent has line operation safety audit of pilot behaviors' recorded in the selected domestic airlines in Nigeria?

Table .3. Percentage response on line operation and safety audit of pilot behavior in the selected domestic airlines in Nigeria

Airlines	**Very often**	**Often**	**Less Often**	**Not at all**	**Total**
A	372(95%)	14(4%)	5(1%)	0	
Ae	357(91%)	31(8%)	3(1%)	0	
P	367(94%)	11(3%)	11(3%)	2(2%)	**391**
D	380(97%)	4(3%)	0(0%)	0	
FN	379(97%)	10(2%)	2(1%)		
Total	**1855**	70	21	9	

Source: fieldwork (2016)

Questions raised on the extent of the record of pilots behaviors in the selected domestic airlines in Nigeria showed that 95% of the respondent in Airline Ar said very often the extent that their airlines records pilots behaviors during flights. 91% of respondents in airline Ae said they very often record pilots behaviors during flight. 94% of the respondents in P air said very often the extent of the record of pilot behaviors. A larger portion of the respondents at 97% in D air said very often the extent of the record of pilots behaviors during flight. 97% of the respondents in FN airlines said very often the extent of the records of pilots behavior.

These findings corroborates with the incidences of the records received of the pilots behaviors on the incidence of a fully-loaded plane of P airline which aborted land Mbakwe Airport, Owerri. The pilot discovered that the runway had been invaded by cows.

.2 Research Question 3: How often is the operational flight data monitoring system and analysis of aircraft flight recorder monitored in the selected domestic airline in Nigeria.

Table .3 Percentage response on the operational flight data monitoring system and analysis of aircraft flight recorder monitored in the selected domestic airline in Nigeria.

Airlines	Very often	Often	Less Often	Not at all	Total
Ar	391(100%)	0(0%)	0(0%)	0(0%)	
Ae	386(99%)	5(1%)	0(0%)	0(0%)	
P	389(99%)	2(1%)	0(0%)	0(0%)	
D	391(100%)	0(0%)	0(0%)	0(0%)	**391**
FN	383(98%)	8(2%)	0	0	

Source: fieldwork (2016)

Figure .2: Extent of monitoring of flight data

Question raised on the extent of the monitoring of flight data monitoring system and aircraft flight recorder in the selected domestic airline in Nigeria,, showed that 100% of the respondents in airline and very often, 99% of respondents in Ae airline said very often, 99% of respondents in airline P said very often. 100% of the respondents in D airline said very often.

.4 Research Question 4: To what extend is the operational safety of personnel conducted during normal air traffic control in the selected domestic airlines in Nigeria?

Table .4 Percentage response the operational safety of personnel conducted during normal air traffic control in the selected domestic airlines in Nigeria

Airlines	Very often	Often	Less Often	Not at all	Total
Ar	391(100%)	0(0%)	0(0%)	0(0%)	
Ae	389(99%)	5(1%)	0(0%)	0(0%)	
P air	391(99%)	2(1%)	0(0%)	0(0%)	
D air	391(100%)	0(0%)	0(0%)	0(0%)	**391**
FN	391(100%)	0	0	0	

Source: fieldwork (2016)

Conduct of operational safety of personnel

Figure .3: Conduct of operational safety of personnel

Information gathered on the extent of the operational safety of personnel conducted during normal air traffic control in the selected domestic airlines in Nigeria, showed that 100% of the respondent in Ar airline said very often, while 99% of respondents in Ae airline also said very often 100% of the respondents in P air said very often the extent of the operation safety of personnel conducted during normal air traffic control in the selected domestic airlines in Nigeria. 100% of respondents from D air also said very often.

.5 Research Question 5: What is the level of compliance on air safety management in selected domestic airlines in Nigeria.

Table 4.3.5: Percentage response on the level of compliance on air safety management in selected domestic airline in Nigeria.

Airlines	Very high	High	Low	
Ar	391(100%)	0(0%)	0(0%)	
Ae	391(100%)	0(0%)	0(0%)	
P air	391(100%)	0(0%)	0(0%)	
D air	391(100%)	0(0%)	0(0%)	
FN	391(100%)	0	0	

Source: fieldwork (2016)

Figure 4.4: Air Safety compliance level of airlines

Information retrieved on the level of compliance on air safety management in selected domestic airlines in Nigeria, showed that respondents in all the selected domestic airlines said that the level of compliance on air safety management is very high. This was shown by 100% of the respondents who attested to this.

However, the stow away incident where a teenager beat airline and airport security at the Benin Airport and sneaked into the tyre compartment of a Lagos-bound plane, where the flew safely to the Murtala Muhammed Airport, Lagos, raises doubt the compliance of air safety management. FAAN (2013) held Air liable for the circumstances leading to the stowaway of a teenage boy on its aircraft at the Benin Airport". In a statement signed by FAAN, said, Ar Air acted with impunity by not stopping the aircraft to check when the crew and ground personnel's attention was drawn to an abnormality on the tarmac. According to the FAAN spokesman, the procedure for such infraction is for the crew to abort the flight and return to the apron for check-up.

Alcohol or drug intoxication was identified as a factor in 23 percent of cases, though in the vast majority of instances these were consumed prior to boarding or from personal supply without knowledge of the crew. "Untruly and disruptive behavior is simply not acceptable. The anti-social behavior of a tiny minority f customers can have unpleasant consequences for the safety and comfort of all on board. The increase in reported incidents tells us that more effective deterrents are needed. Despite these negative social behaviors by passengers, the Nigerian aviation has continued to maintain international standard as shown from our findings.

"Airlines and Airports are guided by core principles developed in 2014 to help percent and mange such incidents, but we cannot do it alone. That's why we are encouraging more governments of ratify that Montreal Protocol 2014". Alexandre de Juniac, IATA's director general/CEO, said. The Tokyo Convention was modernized with the Montreal protocol 2014, closing gaps in the international legal framework dealing with untruly passengers.

To further boost the level of compliance, Hadi Sirika, Minister of State, Aviation, Has called on International Civil Aviation Organizational (ICAO) and member states to continue to put in place proactive measures to curb ever-increasing threat to security of civil aviation in this contemporary times. Sirika made this during the 39th ICAO General Assembly at ICAO Headquarters in Montral, Canada.

This call is coming at a time global terrorist attacks in airport across the world is on the rise, and experts in various countries are seeking for coordinated intelligence gathering and sharing of security information among stakeholders Nigeria continues to participate in the ICAO'S PKD and support ICAO's effort to provide assistance to other West African states in their resolve to introduce e-passport, the Minister said.

He explained that stakeholders were at the meeting to seek new strategies that would make air transportation safe, secure, efficient and above all environmentally friendly.

He mentioned that Nigeria, even prior to he initiative, had been collaborating with ICAO and African Civil Aviation Commission, AFCAC to promote safety in the West African sub-region, through the hosting and subvention funding of the Banjul Accord Group Aviation Safety Oversight Organization (BAGASOO), the aviation safety organization. Nigeria will continue to champion the advancement of civil aviation in the

sub-region, through the continuous hosting and sponsorship of ICAO's safety, security, air transport and environmental programmes, including comprehensive regional implementation plan of aviation safety in Africa, he assured.

Test of Hypotheses

Ho: There is no significant relationship between the level of the compliance on air safety management and the number of accidents and system failure in the selected airlines in Nigeria.

Table .1: Showing contingency table for observed and expected frequencies for Hypotheses I

Respondents	**Agree**	**Strongly Agree**	**Disagree**	**Strongly Disagree**	**Total**
Male	63(77)	280(260)	8(13)	3(5)	354
Female	22(8)	7(27)	6(1)	2(0.5)	37
Total	**85**	**287**	**14**	**5**	**391**

Source fieldwork (2016)

The table above shows chi-square x^2 calculated value for research hypothesis 1 as follows.

To arrive at the expected value, we multiply the total of each row by the total of each column and divide by the total number of respondents.

$$X^2 = \sum_{ei} \frac{(0i-ei)^2}{}$$

Where O = Observed frequency

e = Expected frequency

$$= \frac{(63-77)}{77} + \frac{(280-260)^2}{260} + \frac{(8-13)^2}{13} + \frac{(3-5)^2}{5}$$

$$= \frac{(22-8)^2}{8} + \frac{(7-27)^2}{27} + \frac{(8-13)^2}{10.5} + (2-0-5)^2$$

$= 3+2+2+2+25+15+49+4.5$

$= 103$

To compare calculated value with table value, let us determine the Degree of Freedom (df)

df = (R-1) (C-1)

= (4-1) (2-1)

= 3x1

= 3

Result

$$X^2 = \sum \frac{(0_1-e_1)^2}{e_1}$$

$X^2 = 103$

Table value of X^2 at 0.1 of significance is 6.25

At U = 0.1, V = 3 Cal X^2 = 103 Tab X^2 = 6.25

Chi-square rule: It is a generally accepted chi-square rule that; the hypothesis should be accepted if the calculated value in the chi-square table is less than the table value and reject Null hypothesis if the calculated value is greater than the table value.
On the note therefore, since the calculated value X^2 IS 103 and table value is 6.25, we reject the null Ho: There is no significant relationship between the level of the compliance on air safety management and the number of accidents and system failures in the selected airlines in Nigeria, and accept the alternate there is a significant relationship between the level of he compliance on air safety management and the number of accidents and system failures in the selected airlines in Nigeria.
Ho: There is no significant relationship between the operational flight data monitoring system and the level of compliance on air safety management in the selected airlines in Nigeria.

Table .2 Showing contingency table for observed and expected frequencies for hypothesis 2

Respondents	**Agree**	**Strongly Agree**	**Disagree**	**Strongly Disagree**	**Total**
Male	63(75)	273(254)	8(12)	3(4)	347
Female	22(10)	14(32)	6(1.6)	2(0.6)	44
Total	85	287	14	5	391

Source fieldwork (2019)
The table above shows chi-square X^2 calculated value for research hypothesis 1 as follows:
To arrive at the expected value, we multiply the total of each row by the total of each column and divide by the total number of respondents.

$$X^2 = \sum \frac{(0_1-e_1)^2}{e_1}$$

Where O = Observed frequency
e = Expected frequency

$$= \frac{(63-75)}{75} + \frac{(273-254)^2}{254} + \frac{(8-12)^2}{12} + \frac{(3-4)^2}{5}$$

$$= \frac{(22-10)^2}{8} + \frac{(14-32)^2}{32} + \frac{(6-1.6)^2}{1.6} + \frac{(2-0-6)^2}{0.5}$$

$$= 2+4+1.4+0.25+14+32+12+4$$

$$= 70$$

To compare calculated value with table value, let us determine the Degree of Freedom (df)
df = (R-1) (C-1)
= (4-1) (2-1)
= 3x1
= 3
Result

$$X^2 = \sum \frac{(0_1-e_1)^2}{e_1}$$

X^2 =

Table value of X^2 at 0.1 level of significance is 6.25
At U = 0.1, V = 3 Cal X^2 = 70 Tab X^2 = 6.25

Chi-square rule: It is a generally accepted chi-square rule that; the hypothesis should be accepted if the calculated value in the chi-square table is less than the table value and reject Null hypothesis if the calculated value is greater than the table value.
On this note therefore, since the calculated value X^2 is 70 and table value is 6.25, we reject the null Ho: There is no significant relationship between the operational flight data monitoring system and the level of the compliance on air safety management in the selected airlines in Nigeria and accept and the alternate hypotheses there is a significant relationship between the operation flight data monitoring system and the level of compliance on air safety management in the selected airlines in Nigeria.
Ho: There is no significant between line operation safety audit of pilot behavior and normal operational safety survey of personnel of the selected airlines in Nigeria.

Table .3: Showing contingency table for observed and expected frequencies for hypotheses 3

Respondents	**Agree**	**Strongly Agree**	**Disagree**	**Strongly Disagree**	**Total**
Male	63(74)	274(220)	8(12)	3(4)	348
Female	22(10)	13(35)	6(1.7)	2(0.5)	43
Total	85	287	14	5	391

Source fieldwork (2019)
The table above shows chi-square X^2 calculated value for research hypothesis 1 as follows:
To arrive at the expected value, we multiply the total of each row by the total of each column and divide by the total number of respondents.

$$X^2 = \sum \frac{(0_1-e_1)^2}{e_1}$$

Where O = Observed frequency
e = Expected frequency

$$= \frac{(63-74)}{74} + \frac{(250-220)^2}{220} + \frac{(8-12)^2}{12} + \frac{(3-4)^2}{4}$$

$$= \frac{(22-10)^2}{8} + \frac{(14-35)^2}{35} + \frac{(6-1.7)^2}{1.7} + \frac{(2-0-5)^2}{0.5}$$

= 1.6+4+1.3+0.25+14+13+11+4.5

= 49.7
To compare calculated value with table value, let us determine the Degree of Freedom (df)
df = (R-1) (C-1)
= (4-1) (2-1)
= 3x1
= 3

Result

$$X^2 = \sum \frac{(0_1-e_1)^2}{e_1}$$

X^2 =

Table value of X^2 at 0.1 level of significance is 6.25
At U = 0.1, V = 3 Cal X^2 = 49.7 Tab X^2 = 6.25

Chi-square rule: It is a generally accepted chi-square rule that; the hypothesis should be accepted if the calculated value in the chi-square table is less than the table value and reject Null hypothesis if the calculated value is greater than the table value.

On this note therefore, since the calculated value X^2 is 49.7 and table value is 6.25, we reject the null Ho: There is no significant relationship between line operational safety audit of pilot behaviors and normal operational safety survey of personnel of the selected airlines in Nigeria and accept the alternate hypotheses there is no significant relationship between line operational safety audit of pilot behaviors and normal operational safety survey of personnel of the selected airlines in Nigeria.

CONCLUSION

The study concludes and showed that the most common age range was 20-29, followed by 30-39. Majority of the respondents representing 71% of the population were male, while 29% are females. 74% of the respondents were married. 94% of the respondent has tertiary education. Dana air had the most recorded crash and mishaps, with one (1) mishaps and (159) fatalities.

All the selected airlines indicated that they monitored flight data system and aircrafty flight. Even as they all agreed as very high the level of compliance on air safety management. Though mishaps incidents of recorded by Arik air indicated otherwise the high level of air safety management.

Recommendations

Based on the findings from the study, we made the following recommendations;

1. There should be periodic updates on air returns and air mishaps, and this should be done within the context of the Nigerian aviation sector, then, the African and global context, in order to avoid air mishaps and also to understand its causes.
2. Monitoring and Evaluation of Airline Staff. Airline staff trained should be tested based on a systematic M & E update on training
3. Socio-psychological Review: A systematic and periodic review of the psychology of pilots and cabin-crew, to identify on the spot, instances of stress and strain.
4. Effective corporate governance on the part of the regulating agencies in the aviation sector of Nigeria and the establishment of an advanced aviation training institution in Nigeria, to address the issue of research and development, and capacity building.

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