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Reasoning and attributions in injury incidents in major maintenance operations

Mpesi, Kgothatso

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CHAPTER 2:METHODOLOGY

This chapter describes in detail the research methodology that was used during the study, in an attempt to gather data with regard to injuries and incidents in major maintenance operations. The procedure will be provided describing how the implementation of the research was carried out. The sample as well as the selection procedures will be discussed.

2.1 Research Design

The majority of research done on safety in aircraft maintenance has involved the use of quantitative methods. In the present study qualitative research was used to investigate the causes behind the injuries or incidents that happen in major maintenance. Because of the nature of the study and the absence of any manipulation of variables, this study will take place in a naturalistic setting. It is argued that qualitative research is a generic research approach according to which, research takes its departure from the insider perspective of social action.

The goal of this method is defined as describing and understanding rather than explanation and prediction of human behaviour (Babbie, 2001). Qualitative research involves exploration, elaboration and systematisation of the significance of an identified phenomenon. Qualitative data arises from documentation of real events or recording of what people say. The data yielded provides depth and detail through direct quotation (Guba & Lincoln, 1983). Orum, Feagin and Sjoberg (1991) state that qualitative research is advantageous because it seeks to understand social phenomena at greater depth, and

does not only try to unearth the uniformities of social phenomena and subject them to rigorous statistical testing.

Despite its acknowledged contribution, qualitative research is not without critics. Most criticism centres around the researcher's effects on the data they collect. A related criticism concerns a lack of generalisability of the findings to other settings or subjects. Qualitative research has also been criticised as being soft, intangible and fuzzy (Neuman, 1994). However, it is appropriate for the study because of the exploratory nature of the study and to obtain in-depth data that goes deeper into issues focused on.

2.2 Procedure

The procedure that was followed was to first get clearance from the university's ethics committee to conduct the study. A meeting was the set up with safety risk officer from the organisation where it was explained what the research was about, the processes in terms of the sample that was needed to participate in the interviews, how the employees would be selected and the duration of the interviews. The sample was selected based on the information provided from the company regarding injury on duty (IOD) documents.

All the participants selected from these documents had been injured at work. An email was sent out to the manager of the major maintenance department, explaining what the research was about, the duration of the interviews and the names of selected employees and also requesting the venue where the interviews will take place. The dates of the interviews were also provided. The selected employees were approached by the researcher via email and asked if they were willing to participate in the research.

The volunteer employees came to the interviews and they were called from where they worked. Before the interviews, the employees were given an overview of what the research was about and what it entailed and how long the interview would take. They were also told that they have the right not to answer any questions they did not want to answer and that they could withdraw from the study anytime they wanted. The participant information sheet (Appendix A) was given to employees before the interview and also they filled in the biographical questionnaire (Appendix B). They also had to fill in two consent forms. One to consent to the interview and the other to consent to the interview recording (Appendix C and D).

2.3 Sample

Sampling is a process of taking a portion of a population as a representative of that population. The process of sampling is necessary due to the large size of a population and the consequent impracticality and prohibitive cost of testing each member of any population (Denzin, 2000). Thus, sampling involves taking one or more representative subgroups of a population to be evaluated and measured. The essential properties of a subgroup are then generalised back to the population.

The sampling technique that was used was non-probability sampling. Wegner (1995; p170) states that any sampling method where “Observations are not selected randomly is called non-probability sampling”. Furthermore, the sample was drawn to suit the convenience of the researcher.

According to Leedy (1997) convenience sampling was regarded as appropriate even though it makes no pretence of being representative of a population from which it was drawn.

The type of non-probability sampling that was used is purposive sampling. Purposive sampling is when you select your sample on the basis of your own knowledge of the population, its elements and the nature of the research aims, in short based on the judgement and the purpose of the study (Babbie, 2001). The sample was selected from the Injury on Duty (IOD) documents and all the participants had been involved in an accident and had been injured at work. This group of people was selected because they would have a better view and understanding of the causal inferences and contributory factors that may lead to injury incidents in major maintenance.

The selection criteria also included the fact that employees must have witnessed an accident at work, must have been involved in an accident at work and must have been injured at work. Biographical questions such as job title, section where they work in major maintenance, years in present position; number of years experience, gender and race were also gathered. Employees were selected from six sections in major maintenance. Employees involved in the study included five team leaders and twelve technicians in major maintenance.

The research selected technicians and team leaders to find out if they have different views about the incidents they have experienced, and attributions of the causes of those incidents.

All the employees selected met the required criteria. However due to people going on leave, some people were not available to participate and also the time constraints of the data collection time where it was a busy time in their work environment. It was not possible to get the same number of participants from the technicians and team leaders. The sample included only males due to the work itself which is male dominated and also the females that were available did not meet the criteria. Moreover, the sample comprised two black males, one Indian and fourteen white males. This was due to the fact that most black people chose not to participate in the research. Average years in present position were 6 years and average years of experience in the organisation were 17 years. Overall the participants were aware of accidents happening in major maintenance.

The interview schedule was compiled through the information gathered from the literature regarding safety at work especially in aircraft maintenance. The interviews were conducted over a period of eight days; they were conducted in the organisation. The interviews took a period of between 30 to 45 minutes. The interviews were done in different places depending on where the participants worked. They were conducted in a boardroom, supervisor's rooms and an office. The rooms were private and only the researcher and the participants were in the room. Several interviews were recorded and some were not recorded, this depended on the participants if they consented to the

interview being recorded. Thirteen interviews were recorded while four were not recorded. Interviews that were not recorded, data were captured through taking notes. The demographic description of the sample is presented in Table 1.

Table 1: Demographics of the sample (N=17)

		Technicians	Team Leaders
Gender	Male	12	5
	Female	0	0
Race	Black	2	0
	White	9	5
	Indian	1	0
Job Title	Team leaders		5
	Technicians	12	
Average years in present position	6 years		
Average years of work experience	17 years		
Department in major maintenance	Department 1	5	
	Department 2	3	
	Department 3	5	
	Department 4	2	
	Department 5	1	
	Department 6	1	
Accident awareness at work	Witnessed another accident at work	Yes = 15 No = 2	
	Involved in accident at work	Yes = 17	
	Injured at work	Yes = 17	

2.4 Instruments

Semi-structured interviews were used as a data-gathering tool in the study. The interview is a basic model tool of psychological research (Babbie, 2001). Whereas observation permits us to observe behaviour in action, interviewing permits us to understand how people feel about things and how they perceive the world (Babbie, 2001). Semi structured interviews were conducted in order to increase standardisation and reliability while being sufficiently flexible to allow probing (Babbie, 2001). The interview questions were drawn from the theory of reasoned action and attribution theory frameworks.

Hence questions relating to the attribution framework, such as: Please tell us about a maintenance incident, which involved you or someone else. Did the incident occur because of something you or another person did or didn't do? Please describe the most important thing that you or they did wrong or didn't do. What are the causes of these incidents? What do you attribute to be the cause of the incident? Examples of questions relating to reasoned action theory were: What is your belief about the actions taking place or happening? What do you think are the reasons behind the actions or the behaviour that lead to these injury incidents? What do you think are the advantages and disadvantages of performing this behaviour or the choices made?

Also the interview schedule was adopted from Hobbs (2003). The formation of the interview was semi-structured and allowed probing of the answers to get more clarity. (Please see interview schedule in appendix E). For example, questions such as the injury

incidents that they have experienced or witnessed in the past year, what were there attributions or causes towards those injury incidents.

2.5 Data Analysis

Content analysis was used to analyse the data gathered from the interviews. There are different definitions of content analysis that are given by different people. Content analysis is a procedure to facilitate objective, systematic analysis and or quantification of the content or appearance of qualitative manifest communication (verbal or non verbal, e.g. words, phrases, concepts, themes, characters, sentences, or paragraphs) or recorded information in such a way that the analysis can be repeated and is reliable.

A simpler definition of content analysis is provided by Babbie (2001), who defines it as a phase of information processing in which communication content is transformed through objective and systematic application of categorisation rules, into data that can be summarised and compared. The type of content analysis that was used thematic. Thematic content analysis aims to understand rather than know. One of the most important steps in thematic content analysis is that data is read looking at the themes that arise (Babbie; 2001). This involves determining which aspects of the information are important, categorising them, selecting statements that best represent them and interpreting the data. Categorisation or themes are important in thematic content analysis and the researcher must remember that these themes must adequately reflect their research questions (Babbie, 2001).

The criteria of selection used in any given thematic content analysis must be sufficiently exhaustive to account for each variation of message content and must be rigidly and consistently applied so that researchers or readers, looking at the same messages, would obtain the same comparable results (Berg, 1995). There are certain advantages associated with content analysis. One of them is that "It requires little more than common sense logic to develop a coding system and then implement it" (Rosenthal & Rosnow, 1991, p172). Content analysis is also viewed as a safe methodology because researchers can add necessary information if it is missed or incorrectly coded. It is also cost effective (Berg, 1995).

2.5.1 Categorisation of the data

The first step that was followed was to categorise the data collected from the 17 participants. The participants were classified by labelling them from A-Q and numbering each line of the data under each participant. The data was also arranged by taking each question from the participant and looking for the similarities in their answers. The answers were then classified or categorised under themes and the most important themes that related to the research questions were selected and also through the frequency of the responses.

2.6 Ethical considerations

Emory and Cooper (1991) strongly postulate that ethical issues need to be considered whenever a research study is carried out. Babbie (2001) identified the following issues to be of key concern:

- Informed consent of the respondent was to be obtained.
- Present the aims and what the study entails
- The confidentiality of the respondents was maintained at all time. Their privacy was not invaded.
- The expected benefits of the study were not presented to deceive respondents. They were neither overstated nor understated.

In the study, care was taken to conduct the research in an ethical manner, proper regard for the rights of participants and in accordance with general ethical principles that should govern all social research (Babbie, 2001). The aims and nature of the research were communicated to the respondents in writing on the participant information sheet and also before the interview could take place. The participants were also asked if they had any questions and concerns regarding the interview and the research. At no point were the participants deceived regarding the topic under investigation or the means of data gathering.

The principle of informed consent and their right to not participate, for not being audio taped, and as volunteers was also respected. Confidentiality of the responses was guaranteed by means of assigning a code to the participant's responses. However the employees were told that anonymity of participating in the research will not be guaranteed except the confidentiality of their responses.