

3.0 Methodology

3.1 Survey by Questionnaire

A questionnaire is designed to test the hypotheses. Cohen and Manion (1989) point out that a questionnaire survey is able to gather data at a particular point in time with the intention of describing the nature of existing conditions and determining the relationships that exist between specific events. It is attempted to use a questionnaire to gather data regarding the training conditions in construction safety of the technicians.

The samples to be collected are construction technicians who are working on sites. According to the classification of construction technicians by the VTC Building and Construction Industry Manpower Report, the types of technicians that would be surveyed include site foreman, work supervisor, site agent, land surveyor, laboratory technician, safety supervisor and any other site based technicians.

3.1.1 Distribution of the questionnaires

The questionnaires were distributed to the technician students who are studying at VTC at craft, vocational certificate or certificate levels. The students would take the questionnaires back to work and ask their colleagues to complete the questionnaires. Dispatching the questionnaires in this way has the following advantages:

1. it can guarantee a high return rate,

2. the samples to be surveyed would be very specific as targeted because the questionnaires are distributed directly to the technicians, such as foremen, work supervisors etc.,
3. the students can explain the objectives of the survey to the subjects,
4. the students can respond to any queries raised by the subjects and hence eliminate ambiguity,
5. the students can record and report any problems found on the questionnaires,
6. volunteer bias can be eliminated.

3.1.2 Limitations of the Sampling

However there are also limitations to the samples selected.

1. The questionnaires were mainly distributed to large construction companies because they usually allow employees to study part-time to obtain a formal technical education. The samples collected on small size firms such as decoration companies or sub-contracting companies are small. However, accidents do occur on small projects and in small size companies.
2. The questionnaires received were mainly returned from technicians that have acquired a basic background of education such as Secondary levels because those with less education background would not have interest in reading nor completing the four full pages of questions. Those with lower education background but with

lots of experience tend not to respond to the questionnaires.

3. Some responses are directly returned from the students who are themselves technicians. This group of responses are more “safety conscious” as they have received more safety knowledge than those without formal education and the results may overestimate the safety consciousness of the technicians in general.

3.1.3 Language

The questionnaire was designed in English and was translated to Chinese. The questionnaires that were actually sent out for survey are in Chinese. The questionnaires in both Chinese and English versions are included in Appendix A for reference.

3.1.4 Design of the Questionnaires

The questionnaire is divided into 3 sections :

- i) the first section will collect the general information about the technicians and to identify the roles and involvement of the technicians in construction safety;
- ii) the second section will evaluate whether the technicians have received appropriate safety training and the effectiveness of the training; and

iii) the third section will attempt to address whether the technician is conversant with the safety knowledge in the following areas :

1. legislation requirements
2. Contractual requirements
3. Safe working procedures
4. Application of PPE and other controls
5. Safety management aspect

First Section

Questions 1, 2 - the first two questions are optional and ask for the name of the technician and the name of the company.

Question 3 - asks for the types of company the technicians are working for. Different types of company may have different training strategies such as sub-contractors may have less resources to provide training to their staff.

Question 4 – asks for the number of workers employed on site. For site employing more than 20 workers, a safety supervisor is required mandatory.

Question 5 – asks for whether the company is implementing a Safety Management System. This has a major impact on the safety mission and vision of the company and hence on the amount of training provided to the employees.

Questions 6, 7, 8 - evaluate the job position, years of experience and the level of education of the technicians. The position is mainly based on the classification of

construction technicians by the VTC Building and Construction Industry Manpower Report. The choices given on the questionnaire are mainly site based positions which include foreman, work supervisor, assistant site agent, assistant engineer, land surveyor, site coordinator, safety supervisor and others. The level of education may have specific impact on the training and the desire of an individual to acquire for more training such that this piece of information is needed from the technicians.

Question 9 - it is attempted to identify the roles and responsibilities of the technicians regarding safe operation on site. Typical roles as given below are provided to the technicians for selection. Technicians can provide more than one answer to this question.

Roles that are listed in the questionnaire include :

- supervise work procedures,
- inspect site safety precaution,
- record inspection results,
- carry out work safely,
- train workers,
- supervise and instruct workers on the use of PPE,
- report hazards identified,
- inspect plant and lifting appliances safety installation,
- submit and execute a method statement,
- report incident,
- risk assessment,
- take part in safety committee,
- and others to be specified by the technicians.

Second Section

The second section attempts to evaluate whether the technician has received appropriate safety training and whether the training received is effective, and whether the help of safety supervisors can assist them in their work.

Question 10 - attempts to determine whether the technicians have received any basic industrial safety training such as Construction Industry Safety Green Card or Silver Card training in the past three years. The technicians also need to answer whether the training is sufficient or not.

Question 11 - asks whether the technicians have received training in safety and safe working procedures other than the Green Card or Silver Card in the past 3 years and briefly describe the training such as the duration and the types of training, and comment on their effectiveness.

Question 12 – asks whether the technicians need more training in safety and safe working procedures in order to carry out their work.

Question 13 - safety procedures and on the job training can be provided by Safety Officers or Safety Supervisors. This question asks whether the Safety Officer or Safety Supervisors working in the site offer effective support at time of need.

Question 14 - attempts to collect the impression of the technicians whether their employer

is willing to sponsor them to safety training courses. However, the feed back on this question may not necessary reflect the actual willingness of the employers.

Third Section

Questions 15 to 19 - attempt to evaluate whether the technicians have received such areas of training and whether they think the training would be essential to their jobs.

The areas to be studied are :

- Legal responsibilities
 - (i) Construction (Safety) Regulations
 - (ii) Electricity Safety Regulations
 - (iii) Fire Precautions in Notifiable Workplace Regulations
 - (iv) Protection of Eye Regulations
 - (v) Lifting Appliances and Lifting Gear Regulations
 - (vi) Working in Confined Spaces Regulations
 - (vii) Occupational Safety & Health Ordinance
- Contractual Obligation in safety
- Safe working Procedures & Occupational Health
 - (i) Site Safety Code of Practice
 - (ii) Accident prevention
 - (iii) Occupational Health
- Use of PPE

- Safety Management

Question 20 - it evaluates whether the technicians are willing to spend an average of 42 hours per year in safety training.

Question 21 basically allows the technicians to feedback any safety training that they would consider necessary in order to carry out their duties.

3.2 Analysis Methodology

Two hundred and fifty questionnaires were sent out in May, 2000 and two hundred and three questionnaires were received. A software package Statistical Package for Social Science, SPSS for Windows Release 9.0 was used in the analysis. A data sheet was set up using SPSS and all details of the 203 questionnaires were entered into the database.

Frequency Distribution

A number of variables recorded in the survey would be evaluated using frequency tables and bar charts.

Cross Tabulation

Dependency of variables is evaluated using the cross tabulation of the SPSS. The function also provides Chi-square analysis and the use of observed and expected

frequencies.

Non-parametric Tests

Non-parametric tests are distribution free tests and they do not depend on assumptions about the form of the distribution of the sampled population; where as parametric tests are used to measure data that describes the distribution of the population such as means or variance. According to Bryman and Cramer (1997) parametric tests should only be used when the data fulfil the three conditions :

1. the level or scale of measurement is of equal interval or ratio increment,
2. the distribution of the population scores is normal, and
3. the variances of both variables are equal or homogeneous.

In this study, non-parametric tests using Chi-square distribution were used to test whether groups of data are associated with each others. A Chi-square test can be used to compare observed and expected frequencies of a variable which has three or more categories, and to test whether more than two population proportions can be considered to be equal (Fellows and Liu, 1997).