CHAPTER 2

CHAPTER 2

LITERATURE REVIEW

Definitions

Providing a sound definition is more than finding the meaning or right combination of words to explain a given word. It would be able to clarify and refine concepts, generating a framework within which to develop a pragmatic approach to the subject. Evaluation is no exception and the apparent confusion in the minds of many as to the purposes and functions of evaluation correspond to the ignorance or misunderstanding of what is meant evaluation and related terms such as research, validation, and assessment.

A variety of definitions on evaluation can be found of which many of them are stipulative. However the use of evaluation and validation interchangeably has "muddied the waters" of training evaluation a great deal, affecting the success of evaluation efforts (Wittingslow, 1986). Meanwhile, Rackham (1974) offers perhaps the most amusing and least academic definition of evaluation, referring to it as a form of training archaeology where one is obsessively digging up the past in a manner unrelated to the future! Williams (1976) defines evaluation as the assessment of value or worth. According to Harper & Bell (1982) evaluation refers to the planned collection, collation and analysis of information to enable judgements about value and worth. Some definitions (Goldstein, 1978; Siedman, 1979; Snyder, 1980) focus on the determination of program effectiveness. However, the distinction between formative and summative evaluation is not mentioned by most of these writers, but is implicit in their definitions.

Evaluation is also mixed up by some with the terms measurement and assessment. Evaluation involves description and judgment whereas measurement and/or assessment provides the data on which evaluation is based. This confusion of terms is most obvious when considering the use of "evaluation" and "validation". There seems to be differences between American and British writers in the definition of validation and evaluation. The Americans do not see

validation as separate from evaluation but there are still British writers who appear to draw the distinction between evaluation and validation (Hawes & Bailey, 1985; Rae, 1985). According to Clark (1996), evaluation is the process of gathering information in order to make good decisions. It is broader than testing, and includes both subjective (opinion) input and objective (fact) input. Evaluation can take many forms including memorization tests, portfolio assessment, and self-reflection. Meanwhile, validation carries the meaning of a process of testing the effectiveness of instruction by administering the criterion test immediately after the instruction. Validation can also be said as a process through which a course is administered and revised until learners effectively attain the base line objectives.

According to the British Manpower Services 'Glossary of Training Terms' there exists differences between evaluation and validation. This is being used by many trainers as the basis for discussion, although they are little more than the views of the Glossary's anonymous compiler. The Manpower Services defined validation as follows (Rae, 1986):

Internal Validation. A series of tests and assessments designed to ascertain whether a training program has achieved the behavioural objectives specified.

External Validation. A series of tests and assessments designed to ascertain whether the behavioural objectives of an internally valid training program were realistically based on an accurate initial identification of training needs in relation to the criteria of effectiveness adopted by the organization.

Meanwhile, the definition for evaluation is the assessment of the total value of a training system, training course or program in social as well as financial terms. The British Manpower Services also gave the definition for 'Assessment of Training Effectiveness' which is the process of ascertaining whether training is efficient or effective in achieving prescribed objectives. It covers both evaluation and validation. From definitions given by the British Manpower Services it can be said that 'assessment' covers both evaluation and validation. The difference

between evaluation and validation is that evaluation attempts to measure the overall cost benefit of the course or program and not just the achievement of it's laid down objectives. The term is also used in the general judgmental sense of the continuous monitoring of a program or of training function as a whole.

According to the Macquire Dictionary (1988) to 'validate' is to make valid; confirm; corroborate; substantiate; to give legal force to and legalise. Meanwhile, to 'evaluate' means to ascertain the value or amount of or appraise carefully. According to the Longman Dictionary of Contemporary English, to 'validate' is to make valid especially legally whereas to 'evaluate' is to calculate or judge the value or degree of. The Oxford Advanced Learner's Dictionary stated that to 'validate' is to show that something is reasonable or logical and to make something legally valid and to 'evaluate' is to asses or form an idea of the amount, quality or value of something or somebody. From all the dictionaries meanings, it can be said that to 'validate' is to make something legal meanwhile to evaluate is to ascertain the value of something or somebody.

For the purpose of this research, the term validation and evaluation carries the same meaning. It is a process of determining whether the training or course conducted have attained the intended objectives and whether the training or course has adequately trained the ex-trainees to perform as what is required by their job requirements.

Kirkpatrick's Four Levels of Training Evaluation Model

The Kirkpatrick's Four Level Evaluation Model is perhaps the best known training methodology in the area of Training and Development. The four levels are as follows:

Level 1 - Reaction. As the word implies, evaluation at this level measure how those who participate in the course react to it. This level is often measured with attitude questionnaires that are passed out after most training classes. This level measures only one thing and that is the learner's perception (reaction) of the course. They may be asked how well they liked the instructor's presentation techniques, how completely the

topics were covered, how valuable they perceived each module of the course or the relevance of the course content to their specific job. They might also be asked how they plan to use their new skills back on the job.

Learners are keenly aware of what they need to know to accomplish a task. If the training fails to satisfy their needs, a determination should be made as to whether it's the fault of the course design or method of instructions.

Level 2 - Learning. This can be defined as the extent to which participants change attitudes, improve knowledge and increase skill as a result of attending the course. It addresses the question: Did the participants learn anything? The learning evaluation requires post-testing to ascertain what skills were learned during the training. The post-testing is only valid when combined with pre-testing, so that one can differentiate between what they already knew before training and what they actually learned during the course. Pre-testing can be done before the conduct of training such as entrance tests or quizzes or question and answer sessions between the trainer and participants. Measuring the learning that takes place in a course is important in order to validate the learning objectives.

Evaluating the learning that has taken place is typically focuses on such questions; what knowledge was acquired?, what skills were developed or enhanced? and what attitudes were changed?. Learning measurements can be implemented throughout course, using a variety of evaluation techniques. Measurements at this level would indicate that a program's instructional methods are effective or ineffective, but it will not prove if the newly acquired skills will be used later in the working environment.

Level 3 - Behavior. The level of behavior is defined as the extent to which a change in behavior has occurred because the participants attended the course. This evaluation involves testing the students' capabilities to perform learned skills back on the job. Level 3 evaluations can be performed formally (testing) or informally (observation). It determines if a

behavior change has occurred by answering the question, "Do people use their newly acquired skills, attitudes, or knowledge on the job?" It is important to measure behavior because the primary purpose of training is to improve results by changing behavior. New learning is no good to an organization unless the participants actually use the new skills, attitudes or knowledge in their work activities. Since level 3 measurements must take place after the learners has returned to their jobs, the actual Level 3 measurements will typically involve someone closely involved with the learner, such as a supervisor. Although it takes a greater effort to collect this data than it does to collect data during training, its value is important to the training department and organization. Behavior data provides insight into the transfer of learning from the classroom to the work environment and the barriers encountered when attempting to implement the new techniques learned in the program.

Level 4 - Results. This is defined as the final results that occurred because the participants attended the course: the ability to apply learned skills to new and unfamiliar situations. It measures the training effectiveness, "What impact has the training achieved?" This broad category is concerned with the impact of the program on the wider community (results). It addresses the key question: Is it working and yielding value for the organization? These impacts can include such items as monetary, efficiency, moral, teams, etc. Here we expand our thinking beyond the impact on the learners who participated in the training program and begin to ask what happens to the organization as a result of the training efforts. While it is often difficult to isolate the results of a course, it is usually possible to link training contributions to organizational improvements.

Collecting, organizing and analyzing level 4 information can be difficult, time-consuming and more costly than the other three levels, but the results are often worthwhile when viewed in the full context of its value to the organization. The evaluation process becomes more difficult and time-consuming, although it provides information that is of increasingly

significant value. Perhaps the most frequently used measurement is Level 1 because it is the easiest to measure. However, it provides the least valuable data. Measuring results that affect the organization is more difficult and is conducted less frequently, yet yields the most valuable information, whether or not the organization is receiving a return on its training investment. Each level should be used to provide a cross set of data for measuring training program.

After looking at the Kirkpatrick's Four Levels of Training Evaluation, there are some similarities between the validation phase of the Malaysian Army Training System and Kirkpatrick's model. The Kirkpatrick's model touched on the changes of behaviour, skill, knowledge, and attitude of trainees during and after the course. It also stated the involvement of supervisor in identifying the performance of incumbent while on the job would be an input to a validation process. Kirkpatrick also touched on the value of training towards individual and organisation which is the same with the validation of collective training in the Malaysian Army Training System. Finally, one could say that the validation phase in the Malaysian Army Training System is similar to Kirkpatrick's Four Levels of Training Evaluation Model.

The Malaysian Army Training System

The System Approach To Training (*Pendekatan Latihan Secara Sistematik*) was introduced into the Malaysian Army in 1983. This training methodology, now known as the Malaysian Army Training System or in Bahasa Malaysia as *Sistem Latihan Tentera Darat* is based on the Australian Army model. The aim of the system is to enhance the effectiveness and efficiency of training in the Army. The system, while more applicable to job related individual training is also applicable to collective training.

The Malaysian Army Training System consists of five phases; Phase I - Analyses Training Needs, Phase II - Design Training, Phase III - Develops Training, Phase IV - Conduct Training and Phase V - Validate Training.

Phase I - Analyse Training Needs.

The Phase I or Analyse Training Needs is concerned with analysing the jobs of soldiers (e.g. drivers, gunners, tank commander etc.) and the operational requirement of units (e.g. conduct attack, provide preparatory bombardment, provide fire support etc.). Analysis involves listing the duties and tasks that are performed by a soldier and in the case of a unit, it provides a list of collective tasks associated with its role and equipment. The analysis would provide several answers such as when training is needed?, what needed to be taught?, who need to be trained?, how often should training occur?, where should training be conducted? and how much training is needed?

There are five steps needed to be taken when conducting the analysis; analyse the job, specify tasks and levels of training, analyse the task, review existing training and finally select training setting.

The analysis of the the job will produce the Employment Specification that contains job specification, trainee specification and training specification. After developing the employment specification, the tasks are specified and levels of training are identified for each tasks. There are four levels of training existed in the Malaysian Army Training System; Level 1 - Familiarisation, Level 2 - Trainees may perform the task but under conditions and/or to standards below job requirements, Level 3 -Trainees are required to perform the task under the conditions and to the standards required on the job and Level 4 -Performance under job conditions and standards, frequently repeated for longer retention (tasks related to safety and drills).

Task analysis will the be conducted to determine the conditions under which the task is performed and the minimum standard of performance is required. For individual training, task analysis also involves identifying the enabling knowledge, skills and attitudes required to perform the task. For collective training, major groupings of activities that make up a collective task are identified (e.g. conduct an attack-battle procedure, forming up, assault and reorganization).

Existing training program would be totally or partly reviewed to suit the training requirements. This would be able to minimize duplication of effort in the design and development phases. Existing programs are examined to see if they are compatible with the task analysis information.

Finally the training settings is/are selected in order to determine who should conduct the training and how training requirements can be met. Training settings may be defined as the combination of the who, how and where of training.

Phase II - Design Training

In this phase, specific training objectives are determined. A training objective is simply a precise description of the desired outcome of training. There are four steps in this phase; writing of training objectives, developing tests, determining entry standards and sequencing of training objectives.
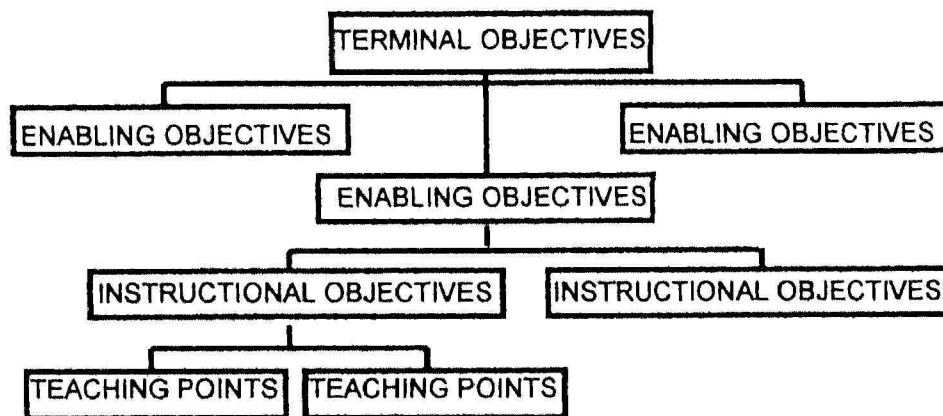
The writing of training objectives is the first step in this phase. There are three types of training objectives as follows:

Terminal Objectives. Terminal objectives are the ultimate measures of task performance. They are the basis upon which trainer and trainee can be assured that the tasks identified as parts of the job can be performed. Terminal objectives are test oriented.

Enabling Objectives. Enabling objectives relate to the knowledge and skills that support the performance of a task. They are objectives the trainee must be able to perform in order to achieve the related terminal objective. These objectives are learning oriented.

Instructional objectives. These objectives refer to the acquisition of a specific skill or knowledge that is needed to fulfill a particular learning requirement and they are teaching oriented.

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Figure 3: Relationship between terminal,
enabling and instructional objectives
(T 3031 - Malaysian Army Training System)

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                    │ TERMINAL OBJECTIVES │
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│ TEACHING POINTS │   │ TEACHING POINTS │
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Tests are developed in this next step. In the Malaysian Army Training System, tests are designed according to the reason for which each is administered. The type of tests available are entry tests, pre-tests, enabling tests and terminal tests.

Then entry standards are stipulated to ensure that only those who qualified are allowed to undertake training of a particular nature. Matters include in the entry are administrative (rank, service, experience, etc.), physical (age, height, weight, colour perception), mental (education standards, qualifications such as language) and medical fitness. In addition to the entry standards, entry tests may also be administered to verify that a potential trainee meets the mental or academic pre-requisites.

The final step in this phase is sequencing of the training objectives. This would ensure that training is conducted in a logical sequence. The learning of some skills will depend upon the prior learning of others.

Phase III - Develop Training.

This phase is concerned with the development of specific training procedures, instructional materials and training aids. There are six steps in this phase. The first step is to prescribe the instructional procedures. In this step instructional objectives are identified, written and classified into categories of

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learning. It is then followed by prescribing the associated aids needed for the training that may assist trainees in the learning process by supporting the means of instruction. In this step the types instructional aids appropriate to each instructional objective is considered and decisions on the instructional methods are made.

The third step is to specify the Training Management Plan (TMP). All individual training requires a TMP for its conduct. Basically, a TMP consists of details such as who does what?, when it is done? and what resources are required?. A TMP is the result of a progressive compilation of materials produced in the analysis, design and develop phases. It may be considered as the 'Operator's Manual' for a course for training.

The next step is reviewing the existing materials (instructional) for the conduct of training. This would be able to save time because the development of instructional material can be very time consuming and therefore it is essential to consider using existing instructional material. The review will include collect existing materials, evaluate existing material and identify modifications required. After reviewing, the next step is to develop instructional material. This step deals with the development of instructional material to be presented to the trainees so that they can achieve the terminal and enabling objectives. Instructional materials produced would include job aids, lessons presented by instructors and lessons delivered by other means.

The final step in this phase is to conduct and validate pilot instructional or trial of instructions. This step ensures that the materials will contribute to effective and efficient training. The process can be related to test a prototype equipment before a production commences. The trial may be conducted with a sample of the trainees. As a minimum, all new instructions should be reviewed by at least one other person qualified to develop the training to ensure the technical contents are sound.

Phase IV - Conduct Training.

During this phase, the TMP is implemented and modified to meet the local requirements where the training is conducted. This is to ensure that the TMP is

appropriate, that administrative and instructional staff are prepared to carry out their assigned duties and responsibilities and that the resources required are available. Then the conduct of instruction will be done. This is where learning takes place and instructions which are developed earlier in order to meet the training needs are presented. The procedures for this step cover reviewing of course documentation, preparation of lessons and tests, conduct instruction and document observation and preparation of student course report.

Phase V - Validate Training.

The final phase in the Malaysian Army Training System is the validation phase. Validation is a continuous process in the Malaysian Army Training System where it identifies changes that have to be made to keep the training efficient and effective. It is a deliberately planned procedure intended to gather information that can be used as a sound basis for the modification of training to ensure that the training is kept relevant to the requirements of the jobs and that the resources are used to the best advantage. There are two stages in the process; internal and external validation.

Internal validation is carried out during the course of training. It assesses the training process to ensure that the training meets the requirements of training objectives and that the training methods are sound. Internal validation is the responsibility of training establishments and is carried out in order to identify problems associated with the way instruction was designed, developed and conducted, to identify problems associated with the causes of trainees' failure to achieve the training objectives set within the planned time and to recommend actions to overcome the problems identified.

External validation takes place subsequent to the completion of the course of training. It assesses the ability of ex-trainees in performing their jobs. External validation is therefore an assessment to ascertain the efficiency and effectiveness of the training. Training effectiveness is determine by seeing how well the ex-trainees performs their tasks on the job. Training efficiency is obtaining data on whether the right amount of training has been undertaken, that is, the ex-trainees are not overtrained or undertrained.

The revision of training may be considered to be the final part of the validation process. The revision is based primarily on the findings of the internal and external validation reports. It is carried out when some deficiencies in training have been detected or when changes in a job take place. Some of the reasons which may require a revision of training are deficiencies in instructions, the need for efficiency in terms of time, money or the utilisation of resources, changes in doctrine, changes in job requirements and changes in equipment. The revision of training is the responsibility of the training establishment.

The phases and steps that exist in the Malaysian Army Training System can be seen in Figure 4.

Figure 4: Phases and Steps in The Malaysian Army Training System
(T 3031 - Malaysian Army Training System Pamphlet)
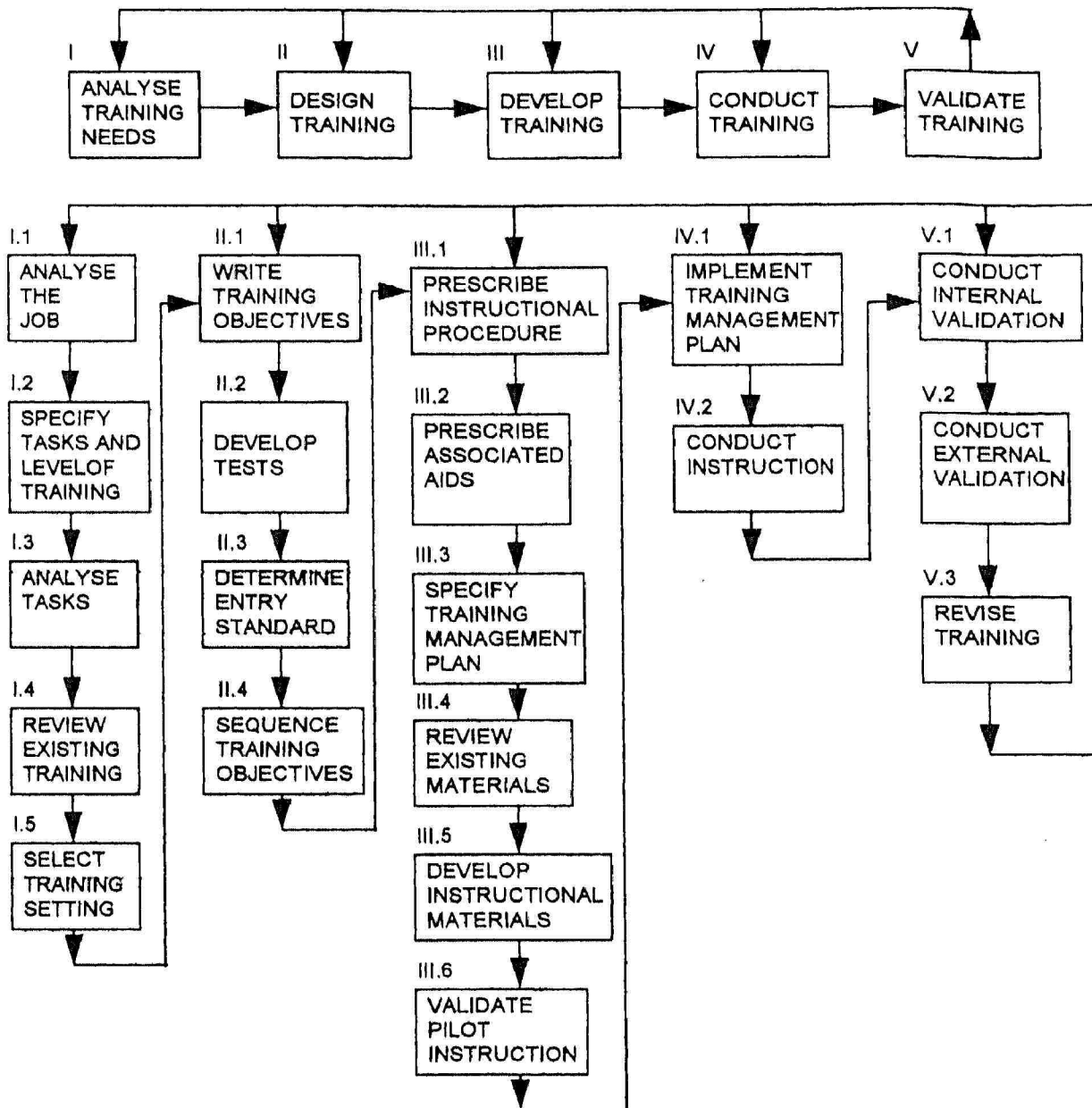
The Reasons And Conduct Of Validation

The Reasons for Validation

There are several reasons for validation. In the context of the Malaysian Army, the reasons are as follows:

Trainer Interest. It is in the interest of the trainers to know if the training that has been conducted is effective and efficient. By having validation, feedback can be obtained when it is measured against the desired objectives.

Training Manager Interest. In the same manner that the trainer has an interest in his own skills and acceptability, the training manager has an interest in the level of performance of his trainers. He may not be able to observe his trainers directly and by having validation (internal and external) he would be able to asses his trainers. Training managers have the training management (Training Adviser) above him who will also be interested in validation. This can make certain that the training institution is operating as an effective and efficient organisation.

Training Adviser and Training Command Headquarters Interest. On the part of the Training Adviser and Training Command Headquarters, they would like to be satisfied that the training conducted is effective, the training is being applied in work situation and the training produce sufficient change in the organisational efficiency that would justify the training expenditure.

Customer or Client Interest. Trainees taking up a course have a number of needs to be fulfilled; individual and organizational. Where client is concern (in this case the unit commanders) the trainees must be able to show and indicate that the training received has able him to perform his tasks in accordance to his employment specifications. Validation on the ex-trainees' performance can be done by extending the validation exercise to include the client.

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The Conduct of Validation

There are several factors that are being considered in conducting validation in the Malaysian Army Training System and these are:

The Areas of Investigation. When planning a validation, the first action is to decide on the areas from which the validation data can be collected. Basically, the areas are trainees reaction towards training, trainees learning, performance on the job and unit results. Data on trainees' reaction will be able to give indications on the acceptability of the training. Acceptability affects trainees motivation which is an important aspect of learning. The trainees learning area involves collecting data on the learning that has taken place for example the before and after measures of knowledge and skill. These data will be able to indicate the changes that have taken place as the result from training. Data derived from the performance on the job will reflect the effectiveness of the training. The standard of individual training will influence the performance of a unit.

However, other factors may also effect unit's performance such as equipment serviceability rate, current strength and availability of external support (i.e. aircraft from the Royal Malaysian Air Force or armoured vehicles from the armour units).

Sources of Information. After identifying the areas of investigation, the sources of information from which the validation data can be gathered will be determined. The main sources that can be use are the instructors or trainers, the trainees, the job incumbent or the ex-trainees and the supervisors. The instructors or trainers are a good source of feedback because he is often able to identify the reasons for poor performance of trainees during training and problems that impede training instructions. However, care must be taken to ensure that the information is not distorted by one or two isolated instances and that the data collected are gathered from an adequate and representative sample of instructors. Trainees are able to give feedback on aspects of course content including activities conducted during the training duration. Their feedback to the learning

activities and tests conducted for the course provides useful information as inputs to validation. The job incumbent should be surveyed between three to six months after completing his training so that he will be able to remember sufficient detail of the course to enable him to relate it to what he is doing on the job. Also he would have sufficient time to gain experience on the job to identify deficiencies in the course. The supervisor of ex-trainees is often the best source for data about performance on the job. Just like the incumbent, the supervisor should not be approached until the ex-trainees has completed three to six months on the job.

Methods of Collecting Information. This is the last factor needed to be considered in conducting validation. Several measuring instruments can be used to collect the relevant data for validation. Each method has its advantages and disadvantages and therefore must be selected and developed carefully. The available instruments are tests, questionnaires, report forms and interviews. In the case for internal validation, tests assess effectiveness of training by measuring the extent to which the training objectives are achieved.For external validation, tests provide measures of performance that indicate the effectiveness of the course. Questionnaires can be use to gather the opinions of all sources of information (instructors or trainers, the trainees, the job incumbent or the ex-trainees and the supervisors). A well-constructed questionnaire allows the instructors, trainees, job incumbent and supervisors to contribute to the process of determining the content of the course. Trainees' report should be able to indicate the training objectives achieved during the course as well as attitude,aptitude and application ability of the student. In most cases, interviews cannot be used as the main source of feedback due to time constraints. The major advantage of the interview is that interviewer is able to concentrate on various issues until he obtains all the information he requires. Techniques of communicating and interviewing must be used in order to get the earnest and fullest answers from interviewees.

Previous Studies

According to Burgoyne and Cooper (1975), a survey was done by Catanello and Kirkpatrick in 1968 on 110 industrial organisations in the area of evaluating training. The main focus was to find out whether evaluation was conducted in industrial training. The survey reveals that the evaluation part was mostly missed and that very few were assessing anything other than trainee reactions.

Galagan (1983) and Del Gaizo (1984) both refer to a survey of Training and Development Journal readers in which 30% of the respondents identified evaluation of training as the most difficult part of their job. Easterby-Smith and Tanton (1985) in their report on British survey involving Human Resource Development practitioners in fifteen organisations stated that in virtually every case the only form of evaluation conducted was end-of-course trainee reactions, and the data so obtained were seldom used. They also observed, much current practice is only a ritual, and in many cases the evaluation that counts is done before the course is ever given; post-course data merely confirm prior judgements that the training is satisfactory. According to Easterby-Smith and Tanton (1985), to many practitioners, evaluation is viewed as a problem rather than a solution, and an end rather than a means. Where evaluation of programs is being undertaken it is often a 'seat of the pants' approach and very limited in its scope. Overawed by quantitative measurement techniques, and lacking both the budget and the time as well as the required expertise for comprehensive evaluations, trainers often revert to checking in the only way they know - post-course reactions - to reassure themselves the training is satisfactory. When such programs are evaluated, the common sources of data (other than trainee reactions) are numbers of participants, decreased absenteeism at work, high rating of instructors, etc. Many trainers are therefore making judgements on the basis of activities ("employee days of training") and not on relevant results. Many practitioners regard the development and delivery of training courses as their primary concern, and evaluation something of an afterthought.

Such findings are similar to Foxon's (1985) survey of a sample of Public Service and private company trainers in Sydney to determine both their attitude to evaluation and what was being carried out by them in practice. All expressed a firm belief in the principle of evaluation, and all administered end of-course forms of varying degrees of complexity to gauge trainee reactions to the instructors, content, and facilities. But 75% admitted that was as far as their evaluation went, mainly because they did not know what else to do.

According to Bramley and Newby (1984) evaluation techniques are not well written up in the literature, and the use of experimental control groups, statistical analysis and similar methods exist only in academic journals. The need for measurement of training effectiveness is often referred to, but there are few good examples of rigorous evaluation of training programs and practitioners do not know how to do much more than basic assessment. Bramley and Newby (1984) identified five main purposes of evaluation; feedback (linking learning outcomes to objectives, and providing a form of quality control), control (using evaluation to make links from training to organisational activities, and to consider cost effectiveness), research (determining relationships between learning, training, transfer to the job), intervention (in which the results of the evaluation influence the context in which it is occurring), and power games (manipulating evaluative data for organisational politics).

Burgoyne and Cooper (1975) and Snyder (1980) discuss evaluation in terms of feedback and the resultant issue of control. A decision must be made about how and to whom evaluation feedback will be given. Evaluators are usually conversant with the purpose of the evaluation once they commence it, but this may be because they have a generalised view that the purpose of evaluation is to produce a certain set of data, or because they have determined what purpose the client wishes the evaluation to have. It is possible however that an evaluator may have no specific purpose. Meanwhile, Morris (1984) believed that evaluation is regarded by most practitioners as desirable in principle, difficult in practice. It also highlights the lack of well written and documented articles for practitioners to learn from.

Yip Lai Yok (1997), conducted a research at Bank Negara using the Kirkpatrick's Evaluation Model to evaluate the training program. In this research, evaluation was done from level 1 to level 3 using the model. Level 4 was not conducted due to difficulty in collecting data (turnover rate, production rate, higher quality in service and costs). The researcher used questionnaires and interviews methods in conducting the research. The ex-trainees were validated after they have finished attending a course and doing their work after 2 months. Their supervisor were also asked in the survey. The research resulted in positive outcome in level 3 (post-course survey), level 2 (gained new knowledge) and level 1 (the participants reaction on the course was favourably) and the course objectives have been met.

An evaluation of the training programs in the Criminal Investigation Department at the College of Criminal Investigation was conducted by Yew Chong Hooi in 1992. The result of the study indicated that the trainees are satisfied with the training programs. The level of satisfaction was not due to the personal characteristics of the respondents in the study. Another finding of the study was there is no significant relationship between satisfaction with the training programs to job proficiency and behaviourial change of the respondents.