

# How the Australian Army does it: Development of training packages in the Defence Force School of Signals

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***Abstract:** The Defence Force School of Signals, as part of the Australian Defence Force, runs numerous leadership and trade courses throughout the year for both Regular and Reserve Defence Force members. These courses are designed to ensure that soldiers are suitably qualified and trained to sufficiently high standards so they can be used effectively in operational deployments (such as war or humanitarian operations). In order to maintain high quality training that is current and up-to date with the rapid inclusion of new technologies, strategies and techniques, constant evaluation and development of courses is conducted. The aim of the current paper is to detail the specific methodology used by the Defence Force School of Signals to evaluate and develop training packages.*

## Introduction

In 1996 The Institution of Engineers, Australia (now Engineers Australia) commissioned a major review of engineering education, with the results presented by Johnson (1996). The findings from the review indicated that the content of engineering courses, as well as the teaching methods, needed to be updated and improved. Since the commissioners of the review are also the accrediting body for engineering courses in Australia, it is not surprising that engineering education institutions started to address the indicated short-comings.

A follow-up report conducted over a decade later by King (2008) found that the changes implemented the educational institutions were less than that required by Johnson (1996). The fact that a national-level review of education was deemed necessary by the accrediting body, and the changes to the education system over a decade later were less than expected by the review authors, highlights the need to improve educational methods and content, as well as improve reviewing systems.

Much research and analysis has been conducted on improving educational methods and content. Examples include, but are not limited to: the overall content of engineering education (Rugarcia *et al.* 2000, Felder *et al.* 2000); the understanding how education needs to be flexible enough to accommodate for students with different educational and motivational backgrounds (Felder and Brent, 2005); outcome-based education versus project-based education (Mills and Treagust, 2003, Tavner, 2005); methods such as role-playing (Maier, 2007), hands-on versus simulated laboratories (Ma and Nickerson, 2006), and the use of humour in classes (Kestell and Missingham, 2006). However, very little work appears to be focus on the actual development of courses.

Jawitz, Marais and Hanrahan (2001) present cases of redevelopment for three different engineering courses. These redevelopments resulted from a national review by the accrediting authority in South Africa in 1998. Although Jawitz, Marais and Hanrahan (2001) highlight that on-going development is possible with the curriculum development, little discussion into ongoing course or curriculum development is made.

To encourage a reassessment of training development in engineering education institutions, assessment of existing training development methods in different educational institutions and environments can be conducted. One example of an educational environment that provides technical based training is the Defence Force School of Signals (DFSS). As part of the Australian Defence

Force (ADF), the DFSS runs technical trade training courses in the field of telecommunications and promotional / leadership training for members of the ADF. In addition to training full-time members of the ADF, the DFSS runs courses for part-time ADF members (Reservists). To ensure that the DFSS deliver quality courses, a continuous cycle of training review, assessment and development is undertaken for all courses.

The aim of the current paper is to detail the training development methodology used by the ADF in order to promote new thinking of the review processes conducted by engineering education institutions. Suggestions on how the training development methodology can be implemented into engineering education are provided. It is hoped that the information presented in the current paper will promote structured internal review processes in engineering education institutions.

## **Military Courses**

The ADF is one of the largest employers in Australia (ABS, 2004). Due to the nature of the work, the training requirements for the ADF can be very specific and also very technical. Consequently, the ADF conducts the majority of training of its members internally, with initial training courses for new members ranging in duration from only a few months to many years. In addition to the specific training requirements, changes to existing courses and development of new courses are frequently undertaken due to the introduction of new technologies, strategies and techniques into the ADF. For this reason, ADF courses undergo regular reviews.

The DFSS is responsible for training defence personnel in military telecommunications systems and operations. The nature of the role of Defence causes the content of courses to be frequently updated with the inclusion of new technologies and techniques. In order to maintain a high level of course quality and relevance, training development wings and branches are established in many Defence training establishments, includes the DFSS.

The training development branch at the DFSS consists of ADF members who are assigned specifically to the role of training development and have completed specific training development courses and nationally accredited training assessment courses. These members are typically senior ranking members who are trade qualified in relevant fields, and have also worked for many years in their respective trade roles. In so doing, the members of the training development branch have very good understanding of what outcomes students of courses should have on completion of the training. Due to their seniority, they should also be aware of the frequently changing nature of military telecommunications.

In addition to having qualified and experienced ADF members assigned to the roles of training development, the ADF has developed and documented the Defence Training Model (DTM) to assist in the continual development of training courses and packages. The DTM is detailed in the Australian Defence Force Publication (ADFP) 7.0.2 – Training Development.

## **The Defence Training Model**

The Defence Training Model (DTM) is a documented system used by the ADF to provide a consistent method to ensure training produces members with suitable skills and knowledge for the use in the ADF. The DTM is shown diagrammatically in Figure 1.

The purpose of the DTM is to provide a method to achieve work force capability requirements effectively and efficiently. This is achieved through a five-phase continuous improvement cycle and is initially applied when a difference is perceived between present and desired performances. The five phases are:

1. Analyse;
2. Design;
3. Develop;
4. Conduct; and,
5. Evaluate.

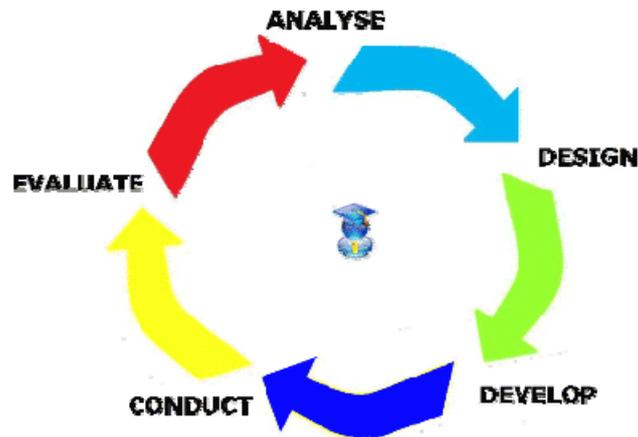


Figure 1: The Defence Training Model cycle

### Analysis Phase

During the Analysis Phase, the needs for training are analysed and specified. This may be due to the introduction of new or modified equipment or procedures, feedback that the current training can be improved or is failing to meet the workplace requirements, or due to a periodic review of competency standards. The final product of the Analysis Phase is the Training Requirement Specification (TRS).

### Design Phase

The Design Phase continues on from the analysis phase with the principal product being a Training Management Package (TMP). A TMP is the authoritative reference for the conduct of the course or training and contains the draft format of the curriculum. The TMP is created by analysing the characteristics of the learner and learning environment and what competencies and learning outcomes are required. It is in this stage that the assessment strategies and training strategies are designed.

### Development Phase

During the Development Phase, the TMP is completed by the addition of supporting materials and equipment. These may already exist or may need to be developed or purchased. It may be decided that a course already being conducted, internally in Defence or in an external agency (for example TAFE) covers most or all of the competencies required.

A pilot course is run to identify any factors that may prevent or restrict the success of the course. If the pilot identifies any areas that require changing, they are reported for corrective action. When any necessary changes have been completed a pilot course may be held again, or the TMP may be given formal approval for use in the Conduct Phase.

### Conduct Phase

The Conduct Phase includes the delivery of the training package. In this phase, the preparation and running of the course/assessments are managed. The final outcome of this phase is a member of the Defence Force who can carry out the workplace requirements outlined in the Analysis Phase. For some courses there may be a requirement for post-course on the job training back at the members unit before they are considered fully competent.

### Evaluation Phase

The purpose of the Evaluation Phase is to measure the success of the training in meeting the workplace performance requirements outlined above in the Analysis Phase. During the Evaluation Phase, feedback is collected from the students, instructors and any other suitable persons (such as course observers and assessors other than the instructors). The feedback information is collated and used to provide possible recommendations back to any of the other four phases of the DTM. This phase therefore includes a method of internal validation that the DTM cycle is working effective and the training package achieves the desired aims.

It is standard procedure that at the beginning of any course at the DFSS, a training development member will explain to the students the Evaluation Phase. Typically, students and instructors can provide anonymous on-line feedback regarding all aspects of the training during the course. The on-line feedback is a combination of multiple-choice responses and short answers, as well as the option to provide detailed comments about any aspect of the training. As the on-line feedback is anonymous, it is not mandatory. Therefore, at the completion of the course the training development member holds an open forum with the students. If the course is of long duration, a number of open forums are held during the course. A similar forum may be held with the instructors of the course. All information collected by the training development cell is held in confidence.

## Discussion

The five phases of the Defence Training Model are used to ensure ADF course packages, as well as the quality of delivery, are of high standards. In engineering education, the same model can be applied both to the individual subjects, as well as the program curriculum. However, it is suggested that the implementation of the model needs to be modified. Specifically, it is not necessary to have a training development cell or branch. Secondly, the feedback from the Evaluation Phase needs to include comments from industry and former graduates.

In terms of not having a dedicated training development cell, it is clear that very few, if any, universities can accommodate having sufficient subject matter experts for each subject, in addition to the actual subject lecturers. However, the importance of a dedicated training development cell should not be overlooked. By separating the training development from subject delivery, personal bias towards content or delivery methods can be reduced, if not removed.

Regarding the feedback of a course, universities should approach industry and recent graduates. As industry is the major “customer” of engineering education, understanding what the customer needs is crucial. However, as engineering industry can be very diverse, different engineering organisations will need different skill sets in their engineers, and it is not possible for engineering students to obtain all the skills required by all industry organisations, within the time frame of engineering education. Therefore, the evaluation from industry needs to come from many different sources. It should be noted that this evaluation provides more feedback on programme development, rather than subject development.

Evaluation of recent-graduate engineers may have similar bias towards specific needs in specific industry positions. However, the advantage of approaching recent graduates is that they are more familiar with course content and how individual subjects may change. Feedback from recent-graduate engineers can provide evaluation toward individual subjects, as well as programmes. There is a lag-time between when subjects were run and when evaluation from industry and recent-graduates are made. Therefore, care needs to be made with both industry and recent-graduate evaluation to ensure changes already made are considered.

Evaluation from current students is still necessary. It is noted that common practice in many universities is to provide students with the option to give feedback on specific subjects. Conducting an open forum discussion, as is done at the DFSS, and highlighting that the information is confidential and anonymous, may increase the constructive feedback from students.

A current difficulty experienced in the ADF in changing a course based on student evaluation is policy that requires the same comments need to be raised for three consecutive courses before a review board will consider what, if any changes are made. For this reason, it is not unusual for the training development member to ask specific questions relating to points raised in previous courses. This policy prevents knee-jerk reactions to some comments, but can also cause a lengthy delay in some necessary changes. Consideration should be made in engineering education as to when evaluations result in subject modification.

It is noted that the DTM is sufficiently flexible to enable training development cells to development modularised courses, as discussed by Birzer, Jones and Birzer, 2009. It is therefore suggested that the using the model in engineering education can enable universities to develop short-courses and modularised courses, as well as existing subjects and programmes.

## Conclusion

The DFSS, as part of the ADF, runs numerous leadership and trade courses throughout the year. As telecommunications equipment and technologies rapidly change, there is a strong need to ensure that the courses delivered are relevant and of high standard. To ensure this happens, the ADF has developed and documented the Defence Training Model (DTM). This paper outlines the method in which the DFSS ensures that the training courses are suitable to provide commanders with soldiers with the needed skill-sets for operational deployments.

The DTM consists of five-phases: Analyse; design; develop; conduct; and, evaluate. These phases, along with the method of implementation produces a continuous cycle of training development, thereby enabling frequent review and update of courses. It is suggested that the model can be implemented into an engineering education environment, although modification of the implement will be needed.

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