



KONGSBERG

SIMflash

Kongsberg Defence & Aerospace - Simulation & Training - ISSUE 2/2009

“shorter training cycles, confidence building, and ready to execute mission requirements.”

A proven and successful method to train soldiers

The PROTECTOR Training System has proven useful for many combat units around the world. Described below are experiences from one unit using the system in a variety of situations.

PROTECTOR Gunner Skill Trainer

The use of the simulators has prepared the students with an actual look and feel use of the CROWS system. As new members are added to the unit, they get submersed into using the simulator systems prior to going out on a real mission, enabling shorter training cycles, confidence building, and ready to execute mission requirements. The training simulators require minimal space and the training can be executed within the vehicle, desktop, or back in the barracks. This allows us maximum use of our time for

any and all training needs. In addition, the training simulator has the extra-added benefit of re-enforcing hand and eye coordination, allowing the students to focus on the mission on hand, and not being distracted from the sight picture.

PROTECTOR Interactive Maintenance Library

The Interactive Maintenance Library is an outstanding tool. It provides both junior and senior technicians an opportunity to direct weapon systems before actually laying hands

on the equipment, it instructs in a step-by-step removal and replacement of weapon station components and ensures competency at all levels. Just like the doctors creed, “Do no harm” is applicable.

PROTECTOR Computer Based Training

Computer based training is a proven and successful method to study and practice continuously, during any part of the day. Soldiers' schedules are unpredictable and this tool allows them to tailor their schedules when it is most convenient for the soldiers.



Designing a perfect training solution

Written by Jens-Petter Røren, Kongsberg Defence & Aerospace

What is the perfect training solution for a product or system? A theoretical assumption is that the training solution should cover all the three learning stages (knowledge, skills and practical training) and that you should be able to perform reasonable tracking and evaluation of the trainees throughout all of the learning life cycle. In addition the training system has to be adaptable for changes to cover upgrades in the real equipment and changes in operational concepts. It should also be designed with open and international standards to be able to conduct interoperable training and content sharing with other training systems. The purpose of this article is to expose some of the challenges and possibilities encountered when designing a training system.

To ensure the most cost effective way of training, it is recommended to start with a Training Needs Analysis (TNA). To be able to conduct a proper TNA, all personnel categories that will be affected by or should give input to the training system have to be involved. This might be different stake-holders, subject matter experts, end users and vendors among others. TNA is a complex discipline and will not be covered any further in this article. However it is strongly recommended that anyone who is considering designing a training system should look into this subject as early as possible. The first thoughts of the training solution should start already in the systems engineering phase of the real equipment to provide input to the trainability of the final product. Another possibility is that if the requirements include development of a simulator; this should ideally be developed before the real equipment to assist concept development and proof of concept. Furthermore the simulator can be used as factory test stand (test and verification) in the development and production phase and of course for training purposes later on.

Evaluation

One of the most important disciplines within training is evaluation and assessment of how much knowledge and skills has the trainee absorbed as a result of the training? Evaluation should therefore always be considered when designing a training system. If not, you might end up with a training system that does not give you the opportunity to do correct and reasonable evaluation. A good evaluation tool also helps you keep focus on learning goals, when you design the training program.

A way to automatically track progress and evaluate the trainee knowledge level is by using a Learning Management System (LMS). Adopting an LMS requires a communication standard that ensures information sharing between your training system and the LMS. The most common standard for this purpose is SCORM. Many organizations have their own LMS to cover several training systems, so this must also be taken into consideration in the design phase. There are several suppliers of LMS systems on the commercial market, even free open source systems are becoming quite

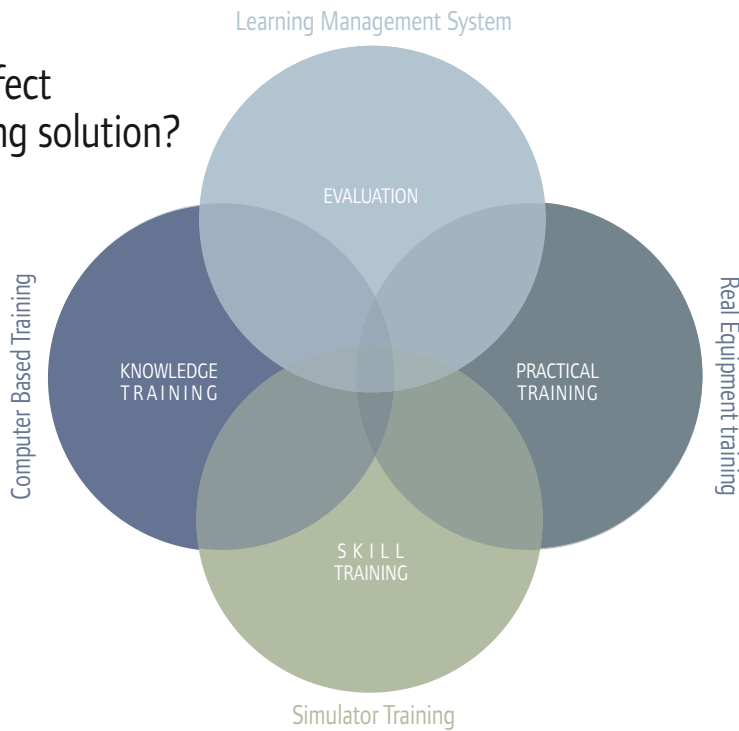
common. It also seems that not only large scale organisations but also more and more individuals are using these kinds of tools to manage their own learning.

It is not common to use an LMS to track skills and practical training. The most likely reason is that there is no common standard for a simulator or similar to communicate with a Learning Management System. However, if the scenarios are designed in a certain way and the interfaces in the training system support it, it is possible to use SCORM for this purpose.

Knowledge

The different training solutions for the different learning stages are many. However, all training solutions are not suitable for all learning stages. For imparting knowledge, the most traditional training is classroom (chalk and talk) lessons. However, the new trend for knowledge transfer is the use of Personal Learning Environments (PLE) or similar. Each individual has their own PLE; internet, blogs, applications, books, e-learning, documentation discussion forums, social networks, etc. The reason for the effectiveness of this way of acquiring knowledge is that the students have

A perfect training solution?



control of their own progress and are learning by 'free will'. Even if some lessons should be conducted by experienced instructors, the most common way of obtaining knowledge today is by Google, wiki-forums, YouTube, discussion forums, etc. Unfortunately, it is hard to control the reliability of the information provided and track the progress of the trainees. With today's technology it is possible to develop controlled PLE's or Computer Based Training (CBT). A typical controlled PLE could be a combination of CBT, Interactive Electronically Technical Manuals (IETM) and controlled discussion forums. The knowledge training program should probably be a combination of structured lessons and case based exercises.

Skill training

The next learning stage is skill training. This can be divided in mental and physical skills. Mental skill training is to ensure optimal

attitude to the task the trainee shall perform. Physical skill training is training on the actual task performed by the trainee. The choice of skill based training systems is often chosen by the need for physical, functional and environmental fidelity in the training system.

Physical skill training is often harder to evaluate. If training is done on real



when designing a training system, either as a vendor or a customer, the learning life cycle has to be viewed in a whole and be clear on what learning stage your system shall support and how the trainees are going to be evaluated.

equipment, the trainees have to be observed to be evaluated. Training in a simulator or advanced Part Task Trainers, often gives the best opportunities for correct evaluation. Evaluation of physical skills can basically be divided into two different types; Achievement based evaluation and performance based evaluation. Example: A gunner has 5 shots to

kill 5 different targets in a simulator scenario. The accomplishment of this task is easy to evaluate and can be tracked in an LMS tool. Performance evaluation criteria might be: in what order were the targets engaged, what was the time consumption between the different target engagements, how long was the target visible before it was engaged etc. This is very hard to track in an LMS. This evaluation method is normally used to improve the skills of the trainee. In most cases you will need both, so neither should be neglected.

Practical training

The last learning stage is practical training. This learning stage often requires the highest level of fidelity, and is therefore often conducted on real equipment in exercises. This is probably the hardest stage in which to perform automatic evaluation. It is of course possible to observe and track results manually and manually enter them into an LMS. However it is imaginable that you will be able to track results from on-board computer systems and upload them to an LMS after the exercise. Another way is to use a simulator to stimulate the real equipment. In this way you can control the scenarios and track the results.

Many challenges, technologies and possibilities have not been discussed in this article. However, the conclusion would be that when designing a training system, either as a vendor or a customer, the learning life cycle has to be viewed in a whole and be clear on what

learning stage your system shall support and how the trainees are going to be evaluated.

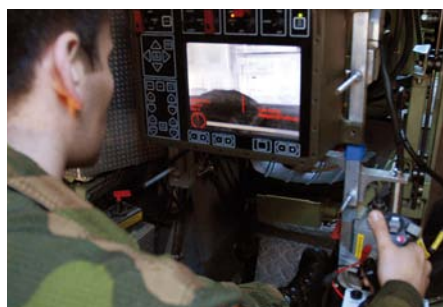
No training system with only one training type or technology can cover all learning stages. Combining different types of training means and technology are the only way to fulfil the total

training need for real equipment and its target group.

The perfect training system should therefore be a system with different types of technology covering all three stages with a common database for evaluation and automatic tracking of the trainees in the most cost effective manner.



PROTECTOR Table Top Trainer



PROTECTOR Embedded Trainer



Realistic 3D environment



Visit us on stand #F150 ITEC 2009

KONGSBERG will exhibit this year at ITEC in Brussels, Belgium from 12th to 14th of May.

ITEC has earned its position as the most important Simulation & Training trade show in Europe. KONGSBERG have chosen to continue our success at ITEC by demonstrating capabilities and products to potential customers and partners. This year KONGSBERG will demonstrate the PROTECTOR Training System, the Combat Trainer for the CV90 vehicle - both systems supported by KONGSBERG's BaSE core technology.

KONGSBERG has enjoyed great international success with the gunnery simulator for the PROTECTOR Remote Weapon Station. Also systems that contain

e-learning for operators and interactive tools for maintenance training have been developed. The PROTECTOR Training System is the most complete and innovative system within electronic training in this market. Over the last decade, KONGSBERG has earned a leading position in simulator marked for the CV90 Combat Vehicle. Several trainers have been set to work and continuous upgrades have been implemented. KONGSBERG will demonstrate our Table Top version of the Combat Trainer CV90 during the trade fair. KONGSBERG training systems are supported by the State-of-the-art BaSE simulator

technology including CGF engine and an upgraded visual simulation based on OpenScenegraph.

We would like to encourage our present and potential new customer to contact us prior to the trade fair, to allow us to set aside time for a demonstration.

Please contact us so we can arrange a time and agenda:

Christian Urheim
Director Marketing & Business Development
christian.urheim@kongsberg.com