Adaptive training methodology: skills analysis for the design of a Targeting Pod training programme

Jelke van der Pal & Machteld van der Vlugt
National Aerospace Laboratory NLR
Amsterdam, The Netherlands

Abstract

Finding and tracking a target, and delivery of a weapon onto the target, using a targeting pod (TGP) requires a highly complex set of skills of a fighter pilot. Considerable amounts of training time and effort are required to master these complex skills. However, available training time is limited. Training effectiveness can be improved by using adaptive training, meaning that the difficulty of the task being trained is varied as a function of actual trainee performance. This paper describes a skills analysis method that facilitates the design of an adaptive training programme for mastering TGP skills based on the 4C/ID method, which assumes that complex skills should be mastered by practicing whole tasks like e.g. typical TGP missions. A systematic analysis of the complex skills that are required for operating the TGP is carried out in consultation with experts. Based on an operational conditions analysis, the difficulty of the task (and hence the level of required skills) is determined. Results of this analysis can be used to adjust the actual training level related to trainee performance.

Introduction

A typical task for a fighter pilot is to eliminate an indicated enemy target. To facilitate this task modern fighter aircrafts are equipped with a targeting pod (TGP). The camera of the TGPs allows the fighter pilots to see the environment farther, sharper and more detailed, and therefore improve their ability to precisely pin-point an enemy target. The TGP is controlled via multifunctional user interfaces (Multi-Function Displays or MFDs). Given the high velocity of the aircraft to minimise amongst others exposure time to threats, it follows that the operation of the TGP requires complex skills. Training of those complex skills takes considerable time. However, available training time is limited. Therefore the training has to be efficient, i.e. it has to produce the desired effect in a minimum amount of time. A training programme is considered to be effective when the necessary skills mastered in training situations are transferred successfully to real-life situations. A training programme is efficient when it realises the same effect for less (e.g. time, effort, or money). Efficient training takes place when training is at an appropriate level of difficulty. The essence of adaptive training is that the difficulty of the training programme is adjusted based on how well the trainee is performing during the