Transfer between training of part-tasks in complex skill training – model development and some experimental data

Jan Joris M. Roessingh¹, Astrid M.L. Kappers², and Jan J. Koenderink²
¹National Aerospace Laboratory NLR, Amsterdam
²Helmholtz Institute, Universiteit Utrecht
The Netherlands

Abstract

One of the most common instruction-strategies for training complex skills is part-training. A complex task can often be divided into part-tasks. Part-training requires that certain part-tasks or combinations of part-tasks be practised in isolation in order to promote the transfer of skills that are needed to perform the whole task.

In this paper a model is developed for the optimisation of schedules for part-training. The model is based on individual learning, but may be generalised to groups of trainees. It is based on the idea that if there is functional skill transfer from part-training to whole-task performance, then there must be a training schedule that yields optimal results. In this context, an optimal training schedule is one in which part-training lasts as long as is necessary to ensure the best possible performance with the whole-task at the end of the training. To prove that an optimal training schedule does in fact exist, an experiment was conducted in which two groups of trainees received sixteen hours of training to learn a complex vehicle control task. One group received whole-task training only, the other group received training with one part-task before being transferred to the whole task. The individual skill-level of all trainees was measured repeatedly by recording the times needed to successfully complete trials on the whole task.

From an analysis of the individual learning curves a ‘skill transfer function’ could be identified. This function was used to determine the optimal part-task schedule. Practical applications of the ‘optimal transfer model’ are discussed.

Introduction

Dividing the whole task into part-tasks

Part-training (or part-task training) has been defined as the training of a number of separate components (part-tasks) as the precursor of practising the whole task. The