GENERAL CONCLUSION

Adaptive Multimedia Learning as a Means for Achieving Adaptive Expertise

In most chapters of this book, the discussed learning environments and instructional methods were aimed at acquisition of task-specific expertise as an ability to perform fluently in a specific class of tasks. For example, expertise reversal effect was investigated in relation to expertise in specific classes of tasks and used for optimizing conditions for developing task-specific expertise. Adaptive learning environments were investigated as a means of tailoring dynamically external instructional guidance to current levels of learner task-specific expertise as they gradually change during learning. However, task-specific expertise is a stage in achieving higher levels of professional expertise. The direct applicability of the expertise reversal effect to higher levels of expertise in broader professional domains (e.g., adaptive expertise) needs to be established in further studies.

In a series of studies with adaptive online tutorials reviewed in the previous chapters, the rapid diagnostic methods were successfully used for the dynamic selection of appropriate levels of instructional guidance that were optimal for learners with different levels of task-specific expertise. Adaptive learning environments based on the expertise reversal effect and rapid diagnostic methods were suitable for optimizing instructional support in developing task-specific expertise. However, they may not be the best environments for the development of self-regulation skills required for adaptive expertise. Alternative adaptive approaches, such as shared-control, advisory, and adaptive guidance models that combine system and learner control during advanced learning stages, could be better suitable for developing attributes of adaptive expertise.

In future, more comprehensive studies are needed for comparing different adaptive methodologies that are optimal for building flexible knowledge and skills. Optimal combinations of different types of control over learning processes for developing adaptive expertise in complex domains need further research. Optimized shared-control and adaptive guidance environments need to be developed and tested in complex and less structured domains leading to the acquisition of adaptive expertise.

Developing adaptive expertise requires cognitive resources for dealing with flexible, non-routine, and creative aspects of performance. Acquisition of task-specific expertise is an essential necessary condition for the release of such resources. Based on the fine-grained dynamic assessment of task-specific expertise and on the expertise reversal effect, adaptive multimedia learning environments could provide learners with individually tailored levels of instructional support. Such optimal levels
of instructional guidance would allow handling new situations without a cognitive overload, thus optimizing learning pathways to higher levels of expertise.