Transfer at the Level of Human-Computer System: Problem Solving using Procedure-Automation Software

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Abstract: Issues of transfer and of human-computer systems are central, but largely separate questions in cognitive science. We take the human-computer system as the unit of analysis and explore how well a human-computer system transfers to tasks outside the scope of the humans' training and the software's design. In two experiments, participants used the procedure automation software (PRIDE) to control simulations of International Space Station habitat systems. Both the software design and the user training addressed routine procedure execution. In the transfer problems the conditions assumed for routine procedure execution were not met, requiring novel problem solving. We report on our methods for complex behavior analysis and our results showing high though imperfect transfer, noteworthy given the widespread difficulty of transfer. Further investigation of transfer at the level of human-computer system is important for understanding what combinations of technology design and user experience enable effectively dealing with the unexpected.