

<i>School/Department:</i>	<i>Department of Psychology, Education & Child Studies Erasmus School of Social and Behavioural Sciences</i>
<i>Project Title:</i>	Self-Management of Cognitive load
<i>Abstract:</i>	<p><i>Today's online learning environments provide learners access to a myriad of textual and graphical learning resources. Whilst there has been much attention for "instructor-manipulated interventions" focusing on how to optimally structure or present such learning materials to reduce cognitive load and maximize learning, the majority of online learning resources remains ill-designed which poses serious cognitive challenges for learners. This research proposal therefore takes a novel research direction by arguing that it is essential that learners themselves are equipped with strategies to deal with poorly structured online learning resources. The main aim of this research project is to investigate whether and how learners can self-manage their cognitive load through manual and mental manipulation of online learning materials (i.e. "self-manipulated intervention"). Teaching learners the skills to self-manage cognitive load (e.g. using the hands -or imagining doing so- to drag text to the corresponding element in a diagram to meaningfully integrate text and diagram) is assumed to facilitate learning by reducing learners' need to search for relevant information and freeing cognitive resources for learning. The PhD student will use controlled experiments to test the central hypothesis that providing guidance in how to self-manage cognitive load during learning will enhance learning and transfer performance. Additionally, it will be investigated whether manual and mental manipulation yield the same learning and transfer outcomes, and to what extent this is affected by the complexity of the learning task.</i></p>
<i>Requirements of candidate:</i>	<p>Background: <i>The candidate needs to have a Master in Educational Psychology, Cognitive Psychology or any other related discipline.</i></p> <p>Master's degree: Yes</p>

	<p>EUR requirement: IELTS: 7.5 (min. 6.0 for all subs.) Or TOEFL: 100 (min. 20 for all subs.)</p>
<p>Supervisor information:</p>	<p>Promotor <i>Prof. Dr. Fred Paas</i> <i>Email address: paas@essb.eur.nl</i></p> <p>Fred Paas is a Professor of Educational Psychology at Erasmus University Rotterdam in the Netherlands and a Visiting Professorial Fellow at the University of Wollongong in Australia. His main research interest is in using knowledge about the human cognitive and motor system in the design of instruction for complex learning environments. He has (co-) authored over 300 publications in (S)SCI listed journals, which been cited over 36.000 times. https://www.eur.nl/people/fred-paas</p> <p>Selected publications</p> <ol style="list-style-type: none"> 1. Ayres, P., Castro-Alonso, J. C., Wong, M., Marcus, N., & Paas, F. (2020). Factors that impact on the effectiveness of instructional animations. In S. Tindall-Ford, S. Agostinho, & J. Sweller (Eds.), <i>Advances in cognitive load theory: Rethinking teaching</i> (pp. 180-193). London: Routledge. 2. Baars, M., Wijnia, L., De Bruin, A., & Paas, F. (2020). The relation between student's effort and monitoring judgments during learning: A meta-analysis. <i>Educational Psychology Review</i>. 3. Baars, M., Wijnia, L., De Bruin, A., & Paas, F. (2020). Sharing the load: A strategy to improve self-regulated learning. D. Dinsmore, L. Fryer, & M. Parkinson, <i>Handbook of strategies and strategic processing</i>. (pp. 234-247). New York: Routledge 4. Castro-Alonso, J. C., Ayres, P., Wong, M., & Paas, F. (2020). Visuospatial tests and multimedia learning: The importance of employing relevant instruments. In S. Tindall-Ford, S. Agostinho, & J. Sweller (Eds.), <i>Advances in cognitive load theory: Rethinking teaching</i> (pp. 89-100). London: Routledge. 5. De Koning, B., Rop. G., & Paas, F. (2020). Learning from split-attention materials: Evidence for a mental self-managed integration effect. <i>Computers in Human Behavior</i>, 110, 106379. 6. De Koning, B., Rop. G., & Paas, F. (2020). The self-management effect in learning from split-attention materials: Mental versus physical integration. <i>Contemporary Educational Psychology</i>, 61, 101873. 7. Duchi, L., Lombardi, D., Paas, F., & Loyens, S. (2020). How a growth mindset can change the climate: The power of implicit beliefs in influencing people's thoughts and actions. <i>Journal of Environmental Psychology</i>, 70, 101461. 8. Eielts, C., Pouw, W., Ouwehand, K, Van Gog, T., Zwaan, R., & Paas, F. (2020). Co-thought gesturing supports more complex problem solving in subjects with lower visual working-memory capacity. <i>Psychological Research</i>, 84, 502-513. 9. Es-Sajjade, A., & Paas, F. (in press). Educational theories and computer game design: Lessons from an experiment in elementary mathematics education. <i>Educational Technology Research and Development</i>. 10. Leppink, J., Paas, F., Van Gog, T., & Van Merriënboer, J. J. G. (2020). How to measure effects of self-regulated learning with checklists on the acquisition of task selection skills. In S. Tindall-Ford, S. Agostinho, & J. Sweller (Eds.), <i>Advances in cognitive load theory: Rethinking teaching</i> (pp. 66-79). London: Routledge. 11. Liu, T. C., Lin, Y. C., Hsu, C. Y., & Paas, F. (in press). Learning from animations and computer simulations: Modality and reverse modality

	<p>effects. <i>British Journal of Educational Technology</i>.</p> <p>12. Mavilidi, M., Ouwehand, K., Okely, A. D., Chandler, P., & Paas, F. (2020). Embodying learning through physical activity and gestures in preschool children. In S. Tindall-Ford, S. Agostinho, & J. Sweller (Eds.), <i>Advances in cognitive load theory: Rethinking teaching</i> (pp.103-118). London: Routledge.</p> <p>13. Mavilidi, M., Ouwehand, K., Riley, N., Chandler, P., & Paas, F. (2020). The effects of an acute physical activity break on test anxiety and math test performance. <i>International Journal of Environmental Research and Public Health</i>, 17: 1523.</p> <p>14. Nazlieva, N., Mavilidi, M. F., Baars, M., & Paas, F. (2020). Establishing the scientific consensus on cognitive benefits of physical activity. <i>International Journal of Environmental Research and Public Health</i>, 17, 29.</p> <p>15. Paas, F., & Sweller, J. (in press). Implications of cognitive load theory for multimedia learning. In R. Mayer & L. Fiorella (Eds.), <i>The Cambridge handbook of multimedia learning 2nd edition</i>. New York: Cambridge University Press.</p> <p>16. Paas, F., & Van Merriënboer, J. J. G. (2020). Cognitive load theory: Methods to manage cognitive load in the learning of complex tasks. <i>Current Directions in Psychological Science</i>, 29, 394-398.</p> <p>17. Pouw, W., Wassenburg, S., Hostetter, A. B., De Koning, B. B., & Paas, F. (2020). Does gesture strengthen sensorimotor knowledge of objects? The case of the size-weight illusion. <i>Psychological Research</i>, 84, 966-980.</p> <p>18. Sepp, S., Howard, S., Tindall-Ford, S., Agostinho, S., & Paas, F. (in press). Working memory: Models and applications. <i>Oxford Research Encyclopedia of Educational Psychology</i>.</p> <p>19. Sepp, S., Agostinho, S., Tindall-Ford, S., & Paas, F. (2020). Gesture-based learning with ICT: Recent developments, opportunities and considerations. In S. Tindall-Ford, S. Agostinho, & J. Sweller (Eds.), <i>Advances in cognitive load theory: Rethinking teaching</i> (pp. 130-141). London: Routledge.</p> <p>20. Van Brussel, S., Verkoeijen, P., Timmermans, M., & Paas, F. (2020). "Consider the opposite" – Effects of elaborative feedback and correct answer feedback on reducing confirmation bias – a pre-registered study. <i>Contemporary Educational Psychology</i>, 61, 101844.</p> <p>21. Weijers, R., De Koning, B. B., & Paas, F. (in press). Nudging in education: towards successful and responsible implication. <i>European Journal of Psychology of Education</i>.</p> <p>22. Wong, M., Castro-Alonso, J. C., Ayres, P., & Paas, F. (2020). The effects of transient information and element interactivity on learning from instructional animations. In S. Tindall-Ford, S. Agostinho, & J. Sweller (Eds.), <i>Advances in cognitive load theory: Rethinking teaching</i> (pp. 80-88). New York: Routledge.</p> <p>23. Xu, M. K., Koorn, P., De Koning, B., Skuballa, I., Lin, L., Henderikx, M., H. W. Marsh, Sweller, J., & Paas, F. (in press). A growth mindset leads to reduced cognitive load and improved learning: Integrating motivation and cognitive load theory. <i>Journal of Educational Psychology</i>.</p> <p>24. Zhang, S., De Koning, B. B., Agostinho, S., Tindall-Ford, S., Chandler, P., & Paas, F. (in press). The cognitive load self-management principle. In R. Mayer & L. Fiorella (Eds.), <i>The Cambridge handbook of multimedia learning 2nd edition</i>. New York: Cambridge University Press.</p>
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