

School/Department:	<i>Erasmus School of Behavioral Sciences (ESSB), Department of Psychology, Education and Child Studies (DPECS)</i>
Project Title:	<i>What do students need to successfully self-regulate their learning using learning analytics in online education?</i>
Abstract:	<p><i>Project description:</i></p> <p>In the context of online learning there can be a lot of freedom and autonomy in what, when, how and why learners would like to learn something, using the materials in the online environment and the learning analytics (e.g., usage data from a learning management system) that are fed back to them. The freedom and wide variety of information sources available places great demands on the learners in terms of their self-regulation skills. That is, students need to be able to set their goals, make plans, choose strategies to learn, monitor and control their learning processes and reflect on it in the context of the enormous amount of information that is available to them. Yet, it is not clear what behaviors we expect learners to show in online environments and what information sources they would use in order to regulate their own learning in an optimal way. Thus, a major question in research in online learning is what type of behaviors and what type of information sources do learners need to be good self-regulated learners?</p> <p>In this PhD project it will be investigated what type of behaviors in online learning environments can be interpreted as good, effective self-regulatory behavior in terms of learning outcomes and what type of information sources (i.e., learning analytics) the learner uses to accomplish this. This will be done in a range of studies and experiments using a variety of methods. First, a systematic review on the studies that have tried to measure effective self-regulated learning behaviors of individuals using learning analytics in online environments will be conducted. In a second study a group of good self-regulated learners and a group of poor self-regulated learners will be followed in terms of their SRL activities and use of learning analytics in an online learning environment. Using qualitative and quantitative methods, the behaviors and learning analytics used by good and poor self-regulated learners will be analyzed and mapped. Based on the results of the second study, a third study will be dedicated to designing a self-regulated learning training using (fading) scaffolds to train and support individual learners to self-regulate their learning using learning analytics and improve their learning outcomes.</p> <p><i>Previous publications on this topic:</i></p>

	<p>Viberg, O., Khalil, M., & Baars, M. (2020, March). Self-regulated learning and learning analytics in online learning environments: a review of empirical research. <i>In Proceedings of the Tenth International Conference on Learning Analytics & Knowledge</i> (pp. 524-533).</p> <p>Wong, J., Baars, M., Davis, D., Van Der Zee, T., Houben, G. J., & Paas, F. (2019). Supporting self-regulated learning in online learning environments and MOOCs: A systematic review. <i>International Journal of Human-Computer Interaction</i>, 35(4-5), 356-373.</p> <p>Wong, J., Baars, M., de Koning, B. B., van der Zee, T., Davis, D., Khalil, M., Davis, D., Houben, G. J., & Paas, F. (2019). Educational theories and learning analytics: From data to knowledge. In Ifenthaler, D., Mah, D., Yau, J. Y. (Eds.), <i>Utilizing Learning Analytics to Support Study Success</i> (pp. 3-25). Springer, Cham.</p> <p>Wong, J., Khalil, M., Baars, M., de Koning, B. B., & Paas, F. (2019). Exploring sequences of learner activities in relation to self-regulated learning in a massive open online course. <i>Computers & Education</i>, 140, 103595.</p>
Requirements of candidate:	<p>Background: Educational sciences, educational psychology, cognitive psychology or similar domains; skilled in quantitative research methods, academic writing, SPSS and/or R statistical software packages, programming skills (e.g. python)</p> <p>Master's degree: Yes</p> <p>EUR requirement: See Table Information about English requirements</p> <p>(If the faculty does not have special English requirements, general requirement from Admission Office is applied)</p>
Supervisor information:	<p><i>The supervisory team will consist of Prof. dr. Fred Paas (promotor), Prof. dr. Marcus Specht (promotor) and Dr. Martine Baars (co-promotor)</i></p> <p>Promotor Prof. Dr. Fred Paas Email address: paas@essb.eur.nl 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,</p>

	<p>which been cited over 36.000 times. https://www.eur.nl/people/fred-paas <i>Selected publications 2020</i></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 effects. <i>British Journal of Educational Technology</i>. 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. 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. 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. 15. Paas, F., & Sweller, J. (in press). Implications of cognitive load theory for
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	<p>multimedia learning. In R. Mayer & L. Fiorella (Eds.), <i>The Cambridge handbook of multimedia learning 2nd edition</i>. New York: Cambridge University Press.</p> <ol style="list-style-type: none"> 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. 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. 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>. 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. 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. 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>. 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. 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>. 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>Promotor Prof. Dr. Marcus Specht Email: specht@essb.eur.nl Prof. Dr. Marcus Specht is Professor for Digital Education at the Technical University of Delft and Director of the Leiden-Delft-Erasmus Center for Education and Learning. He received his Diploma in Psychology in 1995 and a Dissertation from the University of Trier in 1998 on adaptive information technology. From 2001 he headed the department "Mobile Knowledge" at the Fraunhofer Institute for Applied Information Technology (FIT). From 2005 to 2018 he was Professor for Learning Technologies at the Open Universiteit Nederland and head of the Learning Innovation Lab. His research focus is on Computational Thinking, Learning Analytics, AI in Education, and Virtual and Augmented Reality for Education. Prof. Specht is an Apple Distinguished Educator and was President (2013-2015) of the International Association of Mobile Learning.</p> <p>Mobile and Inquiry-Based Learning Suárez, Á., Specht, M., Prinsen, F., Kalz, M., & Ternier, S. (2018). A review of the types of mobile activities in mobile inquiry-based learning. <i>Computers & Education</i>, 118, 38-55.</p>
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	<p>Specht, M., & Suarez, A. (2018). Eine Analyse von Interaktionsmustern für mobiles forschendes Lernen. In <i>Handbuch Mobile Learning</i> (pp. 345-363). Springer VS, Wiesbaden.</p> <p>Rusman, E., Ternier, S., & Specht, M. (2018). Early Second Language Learning and Adult Involvement in a Real-World Context: Design and Evaluation of the "ELENA Goes Shopping" Mobile Game. <i>Journal of Educational Technology & Society</i>, 21(3).</p> <p>Learning Analytics Jivet, I., Scheffel, M., Specht, M., & Drachsler, H. (2018, March). License to evaluate: Preparing learning analytics dashboards for educational practice. In <i>Proceedings of the 8th International Conference on Learning Analytics and Knowledge</i> (pp. 31-40). ACM.</p> <p>Di Mitri, D., Schneider, J., Specht, M., & Drachsler, H. (2018). From signals to knowledge: A conceptual model for multimodal learning analytics. <i>Journal of Computer Assisted Learning</i>, 34(4), 338-349.</p> <p>Di Mitri, D., Schneider, J., Specht, M., & Drachsler, H. (2018) Multimodal Challenge: Analytics Beyond User-computer Interaction Data. In Pardo, A., Bartimote, K., Lynch, G., Buckingham Shum, S., Ferguson, R., Merceron, A., & Ochoa, X. (Eds.). (2018). <i>Companion Proceedings of the 8th International Conference on Learning Analytics and Knowledge</i> (pp. 362-365). Sydney, Australia: Society for Learning Analytics Research</p> <p>Augmented Reality and Sensor Technology Specht, M., Hang, L. B., & Barnes, J. S. (2019). Sensors for Seamless Learning. In <i>Seamless Learning</i> (pp. 141-152). Springer, Singapore.</p> <p>Limbu, B. H., Jarodzka, H., Klemke, R., & Specht, M. (2018). Using sensors and augmented reality to train apprentices using recorded expert performance: A systematic literature review. <i>Educational Research Review</i>.</p> <p>Limbu, B. H., Jarodzka, H., Klemke, R., Wild, F., & Specht, M. (2018). From AR to expertise: A user study of an augmented reality training to support expertise development. <i>Journal of Universal Computer Science</i>, 24(2), 108-128.</p> <p>Praharaj, S., Scheffel, M., Drachsler, H., & Specht, M. (2018, September). Multimodal Analytics for Real-Time Feedback in Co-located Collaboration. In <i>European Conference on Technology Enhanced Learning</i> (pp. 187-201). Springer, Cham.</p> <p>Schneider, J., Börner, D., van Rosmalen, P., & Specht, M. (2018). Do you Want to be a Superhero? Boosting Emotional States with the Booth. <i>J. UCS</i>, 24(2), 85-107.</p> <p>Adoption of ICT in Higher Education Jokiahio, A., May, B., Specht, M., & Stoyanov, S. (2018). Obstacles to using E-Learning in an Advanced Way. In <i>The International Conference on E-Learning in the Workplace</i>.</p> <p>Jokiahio, A., May, B., Specht, M., & Stoyanov, S. (2018). Barriers to using E Learning in an Advanced Way. <i>International Journal of Advanced Corporate Learning (IJAC)</i>, 11(1), 17-22.</p>
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	<p>Dr. Martine Baars baars@essb.eur.nl https://www.eur.nl/people/martine-baars</p> <p>Peer reviewed articles</p> <p>2020</p> <p>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>, 1-24. doi: https://doi.org/10.1007/s10648-020-09569-3</p> <p>Nazlieva, N., Mavilidi, M. F., Baars, M., & Paas, F. (2020). Establishing a scientific consensus on the cognitive benefits of physical activity. <i>International Journal of Environmental Research and Public Health</i>, 17, 29-47.</p> <p>Viberg, O., Khalil, M., & Baars, M. (2020, March). Self-regulated learning and learning analytics in online learning environments: a review of empirical research. <i>In Proceedings of the Tenth International Conference on Learning Analytics & Knowledge</i> (pp. 524-533).</p> <p>2019</p> <p>Khalil, M., Wong, J., Baars, M., Zafar, F., & Wasson, B. (2019, September). Evaluating the Usability of a Study Support Mobile App for Higher Education. <i>In World Conference on Mobile and Contextual Learning</i> (pp. 85-93).</p> <p>Raaijmakers, S. F., Baars, M., Paas, F., van Merriënboer, J. J., & Van Gog, T. (2019). Effects of self-assessment feedback on self-assessment and task-selection accuracy. <i>Metacognition and Learning</i>, 14, 21-42.</p> <p>Wong, J., Baars, M., Davis, D., Van Der Zee, T., Houben, G. J., & Paas, F. (2019). Supporting self-regulated learning in online learning environments and MOOCs: A systematic review. <i>International Journal of Human-Computer Interaction</i>, 35(4-5), 356-373.</p> <p>Wong, J., Khalil, M., Baars, M., de Koning, B. B., & Paas, F. (2019). Exploring sequences of learner activities in relation to self-regulated learning in a massive open online course. <i>Computers & Education</i>, 140, 103595.</p> <p>2018</p> <p>Baars, M., Leopold, C., & Paas, F. (2018). Self-explaining steps in problem-solving tasks to improve self-regulation in secondary education. <i>Journal of Educational Psychology</i>, 110, 578- 595.</p> <p>Baars, M., Van Gog, T., De Bruin, A., & Paas, F. (2018). Accuracy of primary school children's immediate and delayed judgments of learning about <i>problem solving tasks</i>. <i>Studies in Educational Evaluation</i>, 58, 51-59.</p> <p>Baars, M., & Wijnia, L. (2018). The relation between task-specific motivational profiles and training of self-regulated learning skills. <i>Learning and Individual Differences</i>, 64, 125-137.</p> <p>Raaijmakers, S. F., Baars, M., Paas, F., van Merriënboer, J. J., & Van Gog, T. (2018). Training self-assessment and task-selection skills to foster self-regulated learning: Do trained skills transfer across domains? <i>Applied cognitive psychology</i>, 32, 270- 277.</p> <p>Raaijmakers, S. F., Baars, M., Schaap, L., Paas, F., van Merriënboer, J., & Van Gog, T. (2018). Training self-regulated learning skills with video modeling examples: Do task-selection skills transfer? <i>Instructional Science</i>, 46, 273-290.</p> <p>2017</p> <p>Baars, M., Van Gog, T., de Bruin, A., & Paas, F. (2017). Effects of problem solving after worked example study on secondary school children's monitoring accuracy. <i>Educational Psychology</i>, 37, 810-834.</p> <p>Baars, M., Wijnia, L., & Paas, F. (2017). The association between motivation, affect, and selfregulated learning when solving problems. <i>Frontiers in psychology</i>, 8, 1346.</p> <p>Raaijmakers, S. F., Baars, M., Schaap, L., Paas, F., & Van Gog, T. (2017). Effects of</p>
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	<p>performance feedback valence on perceptions of invested mental effort. <i>Learning and Instruction</i>, 51, 36-46.</p> <p>Book chapters</p> <p>2020</p> <p>Baars, M., Wijnia, L., de Bruin, A., & Paas, F. (2020). Sharing the load: Strategy to Improve Self-regulated Learning. In D. L. Dinsmore, L. K. Fryer, & M. M. Parkinson (Eds.), <i>Handbook of Strategies and Strategic Processing</i> (pp. 234-247). Routledge, New York.</p> <p>Wong, J., Baars, M., de Koning, B. B., van der Zee, T., Davis, D., Khalil, M., Davis, D., Houben, G. J., & Paas, F. (2019). Educational theories and learning analytics: From data to knowledge. In Ifenthaler, D., Mah, D., Yau, J. Y. (Eds.), <i>Utilizing Learning Analytics to Support Study Success</i> (pp. 3-25). Springer, Cham.</p> <p>Submitted</p> <p>Baars, M., Zafar, F., Hrehovcsik, M., De Jongh, E., & Paas, F. (2020). Ace your self-study: A mobile application to support self-regulated learning. Manuscript submitted for publication.</p> <p>Wijnia, L., & Baars, M. (2020). The role of motivation in learning problem-solving and selfassessment skills with video modeling examples. Manuscript submitted for publication.</p> <p>Wijnia, L., Ista, J., Baars, M., Eielts, C., Wijnen, M. & Loyens, S. (2020). Self-Study in Problem-Based Learning: Can Students Select and Integrate Information from Scientific Texts? Manuscript submitted for publication.</p> <p>Wong, J., Baars, M., De Koning, B., & Paas, F. (2020). Prompting self-regulated learning in a massive open online course: Do learners benefit? Manuscript submitted for publication.</p>
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English requirements: Please refer to Erasmus University China Center official website for your information www.eur.nl/eucc

Erasmus University China Center -> CSC Scholarship -> "I am a prospective CSC PhD Candidate" -> Table 1

Please note that each institute requires difference level of English, make sure to find the right institute. 2022 CSC-PhD programme information will be shared and updated soon!