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EDUCATION

Fall 2021 – Spring 2023	Doctor of Philosophy: Modeling and Simulation School of Modeling, Simulation, & Training University of Central Florida, Orlando, FL *Advisor*: Dr. Roger Azevedo Dissertation: *Capturing and Scaffolding the Complexities of Self-regulation during Game-based Learning*
Fall 2020 – Summer 2021	Doctor of Philosophy: Education; Learning Sciences Track Department of Learning Sciences and Educational Research University of Central Florida, Orlando, FL *Advisor*: Dr. Roger Azevedo **Transferred to School of Modeling, Simulation, and Training Ph.D. Program*
Fall 2018 – Summer 2020	Master of Art: Instructional Design and Educational Technology Department of Learning Sciences and Educational Research University of Central Florida, Orlando, FL, USA *Advisor*: Dr. Roger Azevedo
Fall 2015 – Fall 2017	Bachelor of Science: Psychology University of Central Florida, Orlando, FL, USA

PUBLICATIONS

Peer-reviewed Journal Articles *(# = Undergraduate)*

Dever, D. A., Sonnenfeld, N. A., Wiedbusch, M. D., #Schmorrow, G., Amon, M. J., & Azevedo, R. (2023). A complex systems approach to analyzing pedagogical agents' scaffolding of self-regulated learning within an intelligent tutoring system. *Metacognition & Learning.* https://doi.org/10.1007/s11409-023-09346-x

Soboscinski, M., **Dever, D. A.,** Wiedbusch, M., Mubarak, F., Azevedo, R., & Järvelä, S. (2023). Capturing self-regulated learning processes in virtual reality: Causal sequencing of multimodal data. *British Journal of Educational Technology*, 00, 1–21. https://doi.org/10.1111/bjet.13393

Azevedo, R., Bouchet, F., Duffy, M., Harley, J., Taub, M., Trevors, G., Cloude, E. B., **Dever, D. A.**, Wiedbusch, M. D., Wortha, F., & Cerezo, R. (2022). Lessons learned and future directions of MetaTutor: Leveraging multichannel data to scaffold self-regulated learning with an intelligent tutoring system. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2022.813632

Cloude, E. B., **Dever, D. A.,** Hahs-Vaughn, D. L., Emerson, A. J., Azevedo, R., & Lester, J. (2022). Affective dynamics and cognition during game-based learning. *IEEE Transactions on Affective Computing, 14,* 1705-1717.

Dever, D., Amon, M. J., Vrzakova, H., Wiedbusch, M. D., Cloude, E. B., & Azevedo. R. (2022). Capturing sequences of learners' self-regulatory interactions with instructional material during game-based learning using auto-recurrence quantification analysis. *Frontiers in Psychology.* doi: 10.3389/fpsyg.2022.813677

Dever, D. A., Wiedbusch, M., Cloude, E. B., Lester, J., & Azevedo, R. (2022). Emotions and the comprehension of single versus multiple texts during game-based learning. *Discourse Processes, 59,* 94-115.

Cloude, E. B., Carpenter, D., **Dever, D. A.**, Azevedo, R., & Lester, J., (2021). Game-based learning analytics for supporting adolescents' reflection. *Journal of Learning Analytics, 8,* 51-71.

Cloude, E. B., **Dever, D. A.**, Wiedbusch, M. D., & Azevedo, R. (2020). Quantifying scientific thinking using multimodal data with Crystal Island: Implications for individualized game-learning analytics. *Frontiers in Education*, *5*, 572546. doi: 10.3389/feduc.2020.572546

Dever, D. A., Azevedo, R., Cloude, E. B., & Wiedbusch, M. (2020). The impact of autonomy and types of informational text presentations in game-based environments on learning: Converging multi-channel processes data and learning outcomes. *International Journal of Artificial Intelligence in Education*, *30*, 581-615.

Claypoole, V. L., **Dever, D. A.,** Denues, K. L., & Szalma, J. L. (2019). The effects of event rate on a cognitive vigilance task. *Human Factors*, *61*, 440-450.

Neigel, A. R., **Dever, D. A.**, Claypoole, V. L., & Szalma, J. L. (2019). Task engagement and the vigilance decrement revisited: Expanding upon the work of Joel S. Warm using a semantic vigilance paradigm. *Human Factors, 61,* 462-473.

Book Chapters

Dever, D. A., Cloude, E. B., Wiedbusch, M. D., & Azevedo, R. (in press). Emotion theory and learning analytics: A theoretical framework for capturing emotion regulation using process data. In D. Gasevic, K. Bartimote, & S. Howard (Eds.), *Theory and learning analytics.* Springer.

Wiedbusch, M.¸ **Dever, D. A**., Li, S., Amon, M. J., Lajoie, S., & Azevedo, R. (2023). Measuring multidimensional facets of SRL engagement with multimodal data. In V. Kovanovic, R. Azevedo, D. Gibson, & D. Ifenthaler (Eds.), *Unobtrusive observations of learning in digital environments* (pp. 141–173). Springer.

Azevedo, R., & **Dever, D. A.** (2022). Metacognition in multimedia learning. In R. E. Mayer & L. Fiorella (Eds.), *Cambridge handbook of multimedia learning* (3rd ed, pp. 132-142). Cambridge: Cambridge University Press. doi:10.1017/9781108894333.013

Cloude, E.B., Wiedbusch, M., **Dever, D.A.**, Torre, D., & Azevedo, R. (2022). The role of metacognition and self-regulation on clinical reasoning: Leveraging multimodal learning analytics to transform medical education. In M. Giannakos, D. Spilol, D. Di Mitri, K. Sharma, X. Ochoa, & R. Hammad (Eds.), *The multimodal learning analytics handbook* (pp. 105-129). Springer. https://doi.org/10.1007/978-3-031-08076-0_5

Refereed Conference Proceedings *(# = Undergraduate)*

Dever, D. A., Wiedbusch, M., #Llinas, A., Park, S., & Azevedo, R. (in press). Assessing the complexity of game mechanic use during science learning. Paper to be presented at the *12th Annual Games and Learning Alliance Conference (GALA 2023),* Dublin, Ireland.

Dever, D. A., Sonnenfeld, N., Wiedbusch, M. D., & Azevedo, R. (2023). Identifying transitions between self-regulated learning operations during game-based learning. In E. de Vries, Y. Hod, & J. Ahn (Eds.), *Proceedings of the 3rd Annual Conference of the International Society of the Learning Sciences (ISLS)* (pp. 195-202). ISLS.

Dever, D. A., Wiedbusch, M., & Azevedo, R. (2022). Enhancing learner models for pedagogical agent scaffolding of self-regulated learning. In S. Iyer, J.-L. Shih, W. Chen, M. N. M. D. Khambari (Eds.), *Proceedings of the ICCE 2022 International Workshop on Metaverse and Artificial Companions in Education and Society (MetaACES)* (pp. 426-431). Malaysia & Online: Springer.

Dever, D. A., Amon, M. J., Wiedbusch, M. D., Cloude, E. B., & Azevedo, R. (2022). Analyzing information-gathering behavioral sequences during game-based learning using auto-recurrence quantification analysis. In P. Zaphiris & A. Ioannou (Eds.), *Proceedings of the 24th Annual Human-Computer Interaction International Conference (HCII)* (pp. 60-71). Online: Springer.

Dever, D. A., Sonnenfeld, N., Wiedbusch, M. D., & Azevedo, R. (2022). Pedagogical agent support and its relationship to learners' self-regulated learning strategy use with an intelligent tutoring system. In M. M. Rodrigo, N. Matsuda, A. I. Cristea, & V. Dimitrova (Eds.), *Proceedings of the 23rd International Conference of Artificial Intelligence in Education (AIED)* (pp. 332-343). Durham, UK & Online: Springer.
[Winner of the Best Student Paper Award]

Dever, D. A., & Azevedo, R. (2022). Scaffolding self-regulated learning in game-based learning environments based on complex systems theory. In M. M. Rodrigo, N. Matsuda, A. I. Cristea, & V. Dimitrova (Eds.), *Proceedings of the 23rd International Conference of Artificial Intelligence in Education (AIED): Posters and Late Breaking Results, Workshops and tutorials, Industry and Innovation Tracks, Practitioners' and Doctoral Consortium* (pp. 41-46). Durham, UK & Online: Springer.

Wiedbusch, M., **Dever, D.**, Sonnenfeld, N., & Azevedo, R. (2022). Clustering learner's metacognitive judgment accuracy and bias to explore learning with AIEd systems. In M. M. Rodrigo, N. Matsuda, A. I. Cristea, & V. Dimitrova (Eds.), *23rd International Conference of Artificial Intelligence in Education* (pp. 402-413). Durham, UK & Online: Springer.

Cloude, E. B., Wortha, F., **Dever, D. A.,** & Azevedo, R. (2021). Negative emotional dynamics shape cognition and performance with MetaTutor: Toward building affect-aware systems.

In *Proceedings of the 9th International Conference on Affective Computing & Intelligent Interaction (ACII)*. Nara, Japan & Online: IEEE.

Dever, D. A., Banzon, A. M., #Ballellos, N. A. M., & Azevedo, R. (2021). Capturing learners' interactions with multimedia science content over time during game-based learning. In E. de Vries, Y. Hod, & J. Ahn (Eds.), *Proceedings of the 1st Annual Conference of the International Society of the Learning Sciences (ISLS)* (pp. 195-202). Online: ISLS.

Dever, D. A., Cloude, E. B., & Azevedo, R. (2021). Examining learners' reflections over time during game-based learning. In I. Roll, D. McNamara, S. Sosnovsky, R. Luckin, & V. Dimitrova (Eds.), *Proceedings of the 22nd International Conference of Artificial Intelligence in Education (AIED)* (pp. 129-133). Springer.

Dever, D. A., Wortha, F., Wiedbusch, M., & Azevedo, R. (2021). Effectiveness of system-facilitated metacognitive monitoring strategies on learning in an intelligent tutoring system. In P. Zaphiris & A. Ioannou (Eds.), *Proceedings of the 23rd Annual Human-Computer Interaction International (HCII) Conference* (pp. 250-263). Online: Springer.

Wiedbusch, M., **Dever, D.,** Wortha, F., Cloude, E.B., & Azevedo, R. (2021). Revealing data feature differences between system- and learner-initiated self-regulated learning processes within hypermedia through principal component analysis. In M. Kurosu (Ed.), *Proceedings of the 23rd Annual Human-Computer Interaction International (HCII) Conference* (pp. 481-495). Springer, Cham.

Cloude, E. B., Wortha, F., **Dever, D.**, & Azevedo, R. (2020). How do emotions change during learning with an intelligent tutoring system? Metacognitive monitoring and performance with MetaTutor. In S. Denison., M. Mack, Y. Xu, & B. C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp. 423-429). Cognitive Science Society.

Dever, D. A., Cloude, E. B., & Azevedo, R. (2020). Does prior knowledge influence learners' cognitive and metacognitive strategies over time during game-based learning? In S. Denison., M. Mack, Y. Xu, & B. C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (p. 2146). Cognitive Science Society.

Dever, D., & Azevedo. R. (2019). Autonomy and types of informational text presentations in game-based learning environments. In S. Isotani, E. Millán, A. Ogan, P. Hastings, B. McLaren, & Luckin, R. (Eds.), *Proceedings of the 20th International Conference on Artificial Intelligence in Education (AIED)* (pp. 110-120). Amsterdam, The Netherlands: Springer.

Dever, D.A., & Azevedo, R. (2019). Examining gaze behaviors and metacognitive judgments of informational text within game-based learning environments. In S. Isotani, E. Millán, A. Ogan, P. Hastings, B. McLaren, & R. Luckin (Eds.), *Proceedings of the 20thInternational Conference on Artificial Intelligence in Education (AIED)* (pp. 121-132). Amsterdam, The Netherlands: Springer.

Dever, D., Wiedbusch, M., & Azevedo. R. (2019). Learners' gaze behaviors and metacognitive judgments with an agent-based multimedia environment. In S. Isotani, E. Millán, A. Ogan, P. Hastings, B. McLaren, & R. Luckin (Eds.), *Proceedings of the 20th International Conference on Artificial Intelligence in Education (AIED)* (pp. 58-61). Amsterdam, The Netherlands: Springer.

Neigel. A.R., Claypoole, V.L., **Dever, D.A.**, Fraulini, N.W., Hancock, G.M., & Szalma, J.L. (2018a). Sex differences in the stress and workload of lexical vigilance. In *Proceedings of the Annual Human Factors and Ergonomics Society (HFES)* (pp. 752-756). SAGE.

Neigel. A.R., Claypoole, V.L., **Dever, D.A.**, Fraulini, N.W., Hancock, G.M., & Szalma, J.L. (2018b). Sex differences in lexical vigilance performance. In *Proceedings of the Annual Human Factors and Ergonomics Society (HFES)* (pp. 731-735). SAGE.

Neigel, A.R., Claypoole, V.L., Waldorf, K.M., **Dever, D.A.**, & Szalma, J.L. (2017). Motivational correlates of vigilance task engagement. In *Proceedings of the Annual Human Factors and Ergonomics Society (HFES)* (pp. 1524-1528). SAGE.

Manuscripts / conference proceedings / chapters under review *(# = Undergraduate)*

Dever, D. A., Wiedbusch, M., #Romero, S., & Azevedo, R. (under review). Investigating pedagogical agents' scaffolding of self-regulated learning in relation to learners' subgoals. *British Journal of Educational Technology.*

Dever, D. A., Wiedbusch, M. D., Sonnenfeld, N., & Azevedo, R. (under review). Examining how learners sequentially deploy self-regulated learning operations during game-based learning. *Frontiers in Psychology.*

Manuscripts / conference proceedings / chapters in preparation *(# = Undergraduate)*

Dever, D. A., Robison, B., Soule, T., & Azevedo, R. (in prep). Simulation Outbreak: A platform for detecting systems thinking skills to remediate virology misconceptions. Paper to be submitted to the *Computer-Human Interaction Conference (CHI 2024),* Hawaii, USA.

Wiedbusch, M. D., **Dever, D. A.**, Park, S., & Azevedo, R. (in prep). The integrative model of multidimensional SRL engagement: ISSME. In S. Dawson, C. Mills, S. Joksimovic, D. Gasevic, & G. Siemens (Eds.), *British Journal of Educational Technology: Special Issue on Advancing Theory in the Age of Artificial Intelligence.*

Wiedbusch, M., **Dever, D.,** Burhade, A., Rader, A., & Azevedo, R. (in prep). Challenges in capturing, modeling, and transferring multimodal trace data between immersive virtual reality and the real-world during skill development. *Journal of Learning Analytics.*

Wiedbusch, M., Wortha, F., **Dever, D.,** & Azevedo, R. (in prep). Investigating the temporality of cognitive operations underlying self-regulated learning during game-based learning. *Journal of Educational Psychology.*

CONFERENCE PRESENTATIONS (# = Undergraduate student; * = cancelled/postponed by COVID-19**)**

Azevedo, R., Wiedbusch, M., **Dever, D.,** #Romero, S., & Rader, A. (under review). *Supporting self-regulated learning using pedagogical agents' adaptive scaffolding in an intelligent tutoring system*. Paper submitted to the Annual meeting of the American Educational Research Association (AERA 2024), Philadelphia, PA.

Dever, D. A., Wiedbusch, M., Kalidindi, S., & Azevedo, R. (under review). *Examining team leaders' effectiveness in clinical decision making within a simulated pediatric medical emergency context: A multimodal methodological approach*. Paper submitted to the

Annual meeting of the American Educational Research Association (AERA 2024), Philadelphia, PA.

Dever, D. A., Wiedbusch, M., #Romero, S., & Azevedo, R. (under review). *Pedagogical agents as scaffolders and teachers of self-regulated learning.* Paper submitted to the Annual meeting of the American Educational Research Association (AERA 2024), Philadelphia, PA.

Park, S., **Dever, D.,** Wiedbusch, M., #Romero, S., & Azevedo, R. (under review). *Understanding the role of developmental differences on scientific reasoning during game-based learning*. Paper submitted to the Annual meeting of the American Educational Research Association (AERA 2024), Philadelphia, PA.

Wiedbusch, M., **Dever, D.,** Azevedo, R., Cloude, E., Li, S., Harley, J., Biswas, G., & Pekrun, R. (under review). *The methodological paradigms and accompanying challenges of multimodal data collection for clinical education research*. Symposium submitted to the Annual meeting of the American Educational Research Association (AERA 2024), Philadelphia, PA.

Dever, D. A., Sonnenfeld, N. A., Wiedbusch, M. D., & Azevedo, R. (2023,August). *Using multimodal data to examine self-regulated learning sequences during game-based learning.* Paper presented at the 20th Biennial European Association for Research on Learning and Instruction (EARLI) conference, Thessaloniki, Greece.

Park, S., **Dever, D.,** Wiedbusch, M., & Azevedo, R. (2023, April). *Developmental differences in students' self-regulated learning with game-based learning environments.* Paper presented at the 20th Biennial European Association for Research on Learning and Instruction (EARLI) conference, Thessaloniki, Greece.

Sobocinski, M., **Dever, D.,** Wiedbusch, M., Mubarak, F., Azevedo, R., & Järvelä, S. (2023, April). *Detecting self-regulated learning processes in VR: Causal sequencing of multimodal data.* Paper presented at the 20th Biennial European Association for Research on Learning and Instruction (EARLI) conference, Thessaloniki, Greece.

Wiedbusch, M., **Dever, D.,** & Azevedo, R. (2023, August). *The convergence of multimodal, self-report, and learning outcomes to predict learning and performance in chemistry with virtual reality.* Paper presented at the 20th Biennial European Association for Research on Learning and Instruction (EARLI) conference, Thessaloniki, Greece.

Dever, D. A., & Azevedo, R. (2023, August). *Using multimodal data to diagnose probabilistic misconceptions via an online diagnostic tool.* Paper presented at the 20th Biennial European Association for Research on Learning and Instruction (EARLI) conference, Thessaloniki, Greece.

Dever, D. A., Sonnenfeld, N., Wiedbusch, M. D., & Azevedo, R. (2023, June). *Identifying transitions between self-regulated learning operations during game-based learning*. Paper presented at the 3rd Annual Conference of the International Society of the Learning Sciences (ISLS 2023), Montreal, Quebec, Canada.

Dever, D. A., Robison, B. D., Wiedbusch, M. D., & Azevedo, R. (2023, March). *Simulations as platforms for capturing, measuring, and facilitating self-regulated learning*. Paper presented at the 13th International Learning Analytics and Knowledge (LAK) Conference:

Workshop on Measuring and Facilitating Self-regulated Learning based on Trace Data. Arlington, TX USA.

Park, S., **Dever, D.,** Wiedbusch, M., & Azevedo, R. (2023, March). *Exploring the value of trace data for self-regulated learning in game-based learning environments*. Paper presented at the 13th International Learning Analytics and Knowledge (LAK) Conference: Workshop on Measuring and Facilitating Self-regulated Learning based on Trace Data. Arlington, TX USA.

Wiedbusch, M., D., **Dever, D. A.,** Sonnenfeld, N., & Azevedo, R. (2023, March). Capturing, modeling, and transferring trace data between simulated and real-world skill development. *Paper presented at the 13th International Learning Analytics and Knowledge (LAK) Conference: Workshop on Measuring and Facilitating Self-regulated Learning based on Trace Data.* Arlington, TX USA.

Azevedo, R., Wiedbusch, M., Dever, D., Jyoti, V., Park, S., & Romero, S. (2023, March). Human digital twins as a research platform to study, model, and simulate self-regulated learning in STEM. *Paper presented at the Workshop on Measuring and Facilitating Self-regulated Learning based on Trace Data, at the 13th International Learning Analytics and Knowledge Conference (LAK)*, Arlington, TX, USA.

Azevedo, R., Hoffman, B., Wiedbusch, M., **Dever, D.,** Torre, D., Varadraj, G., Neider, M., & Shoss, M. (2022, September). *Scaffolding diagnostic reasoning with emerging holographic telepresence technologies: Exploring the value of multimodal multichannel self-regulated learning data*. Paper presented at a workshop on Improving the Instrumentation and Feedback for Self-Regulated Learning at the 17th European Conference on Technology Enhanced Learning (EC-TEL), Toulouse, France.

Dever, D. A., Sonnenfeld, N. A., Wiedbusch, M. D., & Azevedo, R. (2022, August). *Embedded pedagogical agents' support of learners' self-regulated strategy use.* Paper presented at the European Association for Research on Learning and Instruction (EARLI), Southampton, UK.

Dever, D. A., Sonnenfeld, N., Wiedbusch, M. D., & Azevedo, R. (2022, July). *Pedagogical agent support and its relationship to learners' self-regulated learning strategy use with an intelligent tutoring system*. Paper presented at the 23rd International Conference of Artificial Intelligence in Education (AIED), Durham, UK.
[Winner of the Best Student Paper Award]

Wiedbusch, M., **Dever, D.**, Sonnenfeld, N., & Azevedo, R. (2022, July). *Clustering learner's metacognitive judgment accuracy and bias to explore learning with AIEd systems.* Paper presented at the 23rd International Conference of Artificial Intelligence in Education (AIED), Durham, UK.

Wiedbusch, M., **Dever, D.,** Sonnenfeld, N., & Azevedo, R. (2022, August). Identifying learner profiles using metacognitive judgment accuracy and Bias to Explore Learning. *Paper presented at the SIG 27 10th international biennial meeting of the European Association for Research on Learning and Instruction (EARLI),* Durham, UK.

Dever, D. A., Amon, M. J., Wiedbusch, M. D., Cloude, E. B., & Azevedo, R. (2022, June). *Analyzing information-gathering behavioral sequences during game-based learning using*

auto-recurrence quantification analysis. Paper presented at the 24th Annual Human-Computer Interaction International (HCII) Conference, Held virtually.

Wiedbusch, M., **Dever, D.,** & Azevedo, R., (2022, April). *How do individual differences of perceived emotion utility effect attention towards pedagogical agents in multimedia learning?* Paper presented at the annual meeting of the American Educational Research Association (AERA), San Francisco, CA.

Dever, D. A., & Azevedo, R. (2021, August). *Do learning gains and problem-solving success predict reflection duration in game-based learning?* Paper presented at the European Association for Research on Learning and Instruction (EARLI), Held virtually.

Dever, D. A., Cloude, E. B., & Azevedo, R. (2021, July). *Examining learners' reflections over time during game-based learning.* Paper presented at the International Conference of Artificial Intelligence in Education (AIED), Held virtually.

Dever, D. A., Wortha, F., Wiedbusch, M., & Azevedo, R. (2021, July). *Effectiveness of system-facilitated metacognitive monitoring strategies on learning in an intelligent tutoring system.* Paper presented at the 23rd Human-Computer Interaction International (HCII) conference, Held virtually.

Wiedbusch, M., **Dever, D.,** Wortha, F., Cloude, E.B., & Azevedo, R. (2021, July). *Revealing data feature differences between system- and learner-initiated self-regulated learning processes within hypermedia through principal component analysis.* Paper presented at the 23rd Human-Computer Interaction International (HCII) conference, Held virtually.

Dever, D. A., Banzon, A. M., #Ballellos, N. A. M., & Azevedo, R. (2021, June). *Capturing learners' interactions with multimedia science content over time during game-based learning.* Paper presented at the annual meeting of the International Society of the Learning Sciences (ISLS), Held virtually.

Dever, D. A., Cloude, E. B., & Azevedo, R. (2021, June). *Examining learners' reflections over time during game-based learning.* Paper presented at the 22nd International Conference of Artificial Intelligence in Education (AIED), Held virtually.

Dever, D. A., Lester, J., & Azevedo, R. (2021, April). *Examining the relationship between metacognition, emotions, and learning within a game-based learning environment*. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Held virtually.

Dever, D. A., Lester, J., & Azevedo, R. (2021, April). *Reading within game-based learning environments: Examining the relationship between autonomy and emotions.* Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Held virtually.

Dever, D. A., Lester, J., & Azevedo, R. (2020, December). *Game elements and metacognitive monitoring use within game-based learning environments.* Paper presented at the annual meeting of the European Association for Research on Learning and Instruction (EARLI), Held virtually.

Dever, D. A., Lester, J., & Azevedo, R. (2020, December). *Reading in game-based learning environments: The influence of autonomy on learners' affective states.* Paper presented virtually at the annual meeting of the European Association for Research on Learning and Instruction (EARLI), Held virtually.

Dever, D. A., Wortha, F., & Azevedo, R. (2020, December). *Understanding learners' metacognitive processes over time in intelligent tutoring systems.* Paper presented at the annual meeting of the European Association for Research on Learning and Instruction (EARLI), Held virtually.

Dever, D. A., Lester, J., & Azevedo, R. (2020, November). *Adapting game-based learning environments to reflect learners' emotions and autonomy while reading.* Paper presented at the annual meeting of the Association for Educational Communications and Technology (AECT), Held virtually.

Cloude**,** E. B., Wortha, F., **Dever, D. A.,** & Azevedo, R. (2020, July). *How do emotions change during learning with an intelligent tutoring system? Metacognitive monitoring and performance with MetaTutor.* Paper presented at the 42nd Annual Meeting of the Cognitive Science Society, Held virtually.

Dever, D., & Azevedo. R. (2019, June). *Autonomy and types of informational text presentations in game-based learning environments.* Paper presented at the 20th International Conference on Artificial Intelligence in Education (AIED), Chicago, IL.

Dever, D., & Azevedo. R. (2019, June). Examining gaze behaviors and metacognitive judgments of informational text within game-based learning environments. Paper presented at the 20th International Conference on Artificial Intelligence in Education (AIED), Chicago, IL.

POSTERS (* = cancelled/postponed by COVID-19)

Dever, D. A., Wiedbusch, M. D., & Azevedo, R. (2023, April). *Improving pedagogical agents for scaffolding using complex systems theory: Analysis and visualization of trace data.* Poster presented at the American Educational Research Association (AREA) Annual Meeting, Chicago, Illinois.

Park, S., **Dever, D. A.,** Wiedbusch, M. D., & Azevedo, R. (2023, April). *Exploring the measurement of learning outcomes and self-regulated learning in game-based learning environments.* Paper presented at the American Educational Research Association (AERA) Graduate Students Research-in-Progress Roundtable Series at the 2023 Annual Meeting. Chicago, Illinois.

Dever, D. A., Cloude, E. B., & Azevedo, R. (2020, July). *Does prior knowledge influence learners' cognitive and metacognitive strategies over time during game-based learning?* Poster presented at the 42nd Annual Conference of the Cognitive Science Society, Held virtually.

Wiedbusch, M., **Dever, D.,** & Azevedo, R. (2020, April). *Can multimedia environments support emerging self-regulatory skills by examining eye-tracking and performance measures over*

time? Poster presented at the annual meeting of the American Educational Research Association (AERA), Held virtually.

Dever, D., Wiedbusch, M., & Azevedo. R. (2019, June). *Learners' gaze behaviors and metacognitive judgments with an agent-based multimedia environment*. Poster presented at the 20th International Conference on Artificial Intelligence in Education (AIED), Chicago, IL.

WORKSHOP CO-CHAIRS AND/OR CO-ORGANIZER

April 2024	**Co-Chair**. *The Methodological Paradigms and Accompanying Challenges of Multimodal Data Collection for Medical Education Research,* Symposium submitted to the Annual meeting of the American Educational Research Association (AERA 204), Philadelphia, PA, USA.
November 2023	**Co-Organizer.** Workshop on *Building your Human Digital Twin (HDT): A Modeling and Simulation Transdisciplinary Approach from Theory to Design, Development, and Implementation*, The 3rd Annual IEEE International conference on Digital Twins and Parallel Intelligence (DTPI), Orlando, FL, USA
May 2023	**Invited Speaker**. The Science and Research of Empathy: From Theory to Practice in the Future of the Workforce. Power Skills Academy for the Summer Youth Program. CareerSource of Central Florida
March 2023	**Co-Organizer**. 2023 Learning Analytics and Knowledge Conference: The Workshop on Measuring and Facilitating Self-regulated Learning based on Trace data, Arlington, Texas USA
April 2023	**Organizer**. Field Trip for Hagerty High School hosted at the University of Central Florida School of Modeling, Simulation, and Training, Orlando, FL USA
November 2022	**Invited Speaker.** Data Analysis and Visualizations. Hagerty High School Student Workshop. School of Modeling, Simulation, and Training, University of Central Florida
November 2022	**Co-Organizer**. Modeling & Simulation Workshop for Technology in Education Research (M.A.S.T.E.R.)-mind, University of Central Florida, Orlando, FL USA
December 2022	**Invited Speaker**. Introduction to the Learning Sciences and the Use of Multimodal Multichannel Data in the Classroom. Fall 2022 I/ITSEC EcosySTEM of Learning Workshop for Teachers; Orlando, FL USA
October 2022	**Invited Speaker**. Virtual Meeting for Human Factors and Ergonomics Society Chapter, University of Virginia, Charlottesville, VA USA
August 2019	**Panelist for Women in STEM**. Crooms Academy of Information Technology, Sanford, FL, USA.

TEACHING EXPERIENCE

Teaching Assistant

Fall 2022 **EME 6465-0001:** ***Intelligent Tutoring Systems Design: Theory & Practice***. School of Modeling, Simulation, and Training, University of Central Florida

Faculty: Dr. Roger Azevedo

This class focused on teaching graduate students the development of intelligent instructional systems, collecting and analyzing multimodal learner data, interpreting human-computer interactions in accordance with learning science theoretical models, and evaluating the effectiveness of intelligent tutoring systems using multimodal data. My role was to aid in the construction of the syllabus, demonstrating and instructing students on how to use iMotions software and various hardware to collect and analyze log files, eye-tracking data, facial expressions of emotions, and physiological responses. Responsibilities included grading bi-weekly assignments and final projects, meeting with students during office hours to discuss class assignments, organizing guest lecturers, and leading lectures on the use and analysis of multimodal data.

Guest/Invited Lecturer

Spring 2024 ***Intelligent Learning Systems for Understanding and Supporting Human Learning***. Department of Computer Science, Saarland University, Germany

Faculty: Dr. Tomohiro Nagashima

This invited guest lecture will focus on my work in the area of self-regulated learning during game-based learning.

ACADEMIC WORK EXPERIENCE

University of Central Florida

- **Postdoctoral Researcher** (Spring 2023 – Present). School of Modeling, Simulation, and Training, University of Central Florida, Orlando, FL, USA
  Faculty: Dr. Roger Azevedo
  - **Overall Responsibilities:**
    - Conduct interdisciplinary research and activities in accordance with a Department of Education funded project focusing on the enhancement of UCF's School of Modeling, Simulation, and Training program by extending the current graduate program to add to the current listing of graduate courses, the design and execution of undergraduate courses in modeling and simulation, and training students to develop, use, and transfer research and analytical skills in the use of multimodal data. Support the development and progression of program courses and a collaborative laboratory for collecting, analyzing, and using multimodal multichannel data across different learning technologies.

        - Collaborate with stakeholder, academic, industry, and K-12 partners to bridge the gap between local high school modeling and simulation programs and UCF's modeling and simulation graduate degrees. Host meetings with partners and internal team members to address activities, challenges, and directions to achieve project milestones.
        - Contribute to and lead annual reports, train and facilitate team members, lead and contribute to scholarly writing, conduct research with members of the interdisciplinary team.
    - **Eradicating Misconceptions about Viruses using Multimodal Trace Data in an Intelligent Game-based Environment across Educational Contexts** (funded by SEPA)
        - Meet with collaborators at the University of Idaho to report activities, conceptualize lab-based study plans, and disseminate research completed by the team.
- **Graduate Teaching Assistant** (Fall 2022). *Intelligent Tutoring System Design: Theory and Practice,* School of Modeling, Simulation, and Training, *Faculty:* Dr. Roger Azevedo.
    - **Overall Responsibilities:**
        - Meet with students during office hours to discuss questions about the class content, developing research questions, and completing coursework.
        - Assist Dr. Azevedo with organizing guest lecturers and grading student papers and presentations as well as teaching segments of multimodal multichannel data collection and analysis including eye-tracking, facial expressions of emotions, and log files.
        - Guide lectures on the collection, use, and analysis of multimodal data including eye-tracking, facial expressions of emotions, and log files. These classes focused on teaching students about how to instrument participants with the hardware, use iMotions software to align and export data, and analyze and interpret data to identify how participants interact with intelligent tutoring systems.
- **Graduate Research Assistant** (2018-2023). School of Modeling, Simulation, and Training (SMST) and the Department of Learning Sciences and Educational Research, Laboratory of the Study of Metacognition and Advanced Learning Technologies; *Advisor:* Dr. Roger Azevedo.
    - **Overall Responsibilities:**
        - Assisting with training and managing undergraduate and graduate research assistants and collaborators' team members; leading, managing, and coordinating research activities with postdoctoral fellows as well as national and international collaborators from North Carolina State University (Drs. James Lester [Computer Science], Jonathan Rowe [Computer Science], and Hollylynne Lee [Mathematics Education]) and University of Georgia (Dr. Laine Bradshaw); contributing to conceptualizing new lab and in-situ (e.g., classroom) from conceptual/theoretical issues to research methodology and analytical plans; developing coding schemes to analyze complex multichannel data sets (e.g., concurrent verbalizations); coding, scoring, and analyzing complex multi-channel data sets; and, reporting on research

activities at biweekly interdisciplinary research meetings with local, national, and international collaborators.

- Contributing to annual reports for federal funding agencies and assist with the conceptualization and writing of federal research grant opportunities with interdisciplinary collaborators (Dr. Barrie Robison, University of Idaho).
- Assist with the conceptualization of new research studies and projects across different settings (in-situ, laboratory); coding, scoring, and analyzing complex multimodal multichannel data sets to disseminate findings at national and international venues including conference papers, manuscripts, book chapters, and dissertation.

- **Enhancing the Impact of Modeling and Simulation Education for the 21st Century Workforce** (funded by the U.S. Department of Education)
  - Collaborate with the Director of the School of Modeling, Simulation, and Training (SMST), National Center for Simulation, and surrounding middle and high schools to create pipelines across K-12, undergraduate, and graduate modeling and simulation programs.
  - Produce surveys and studies to understand the current state of the SMST programs. Contribute to building a future workforce with critical skills and competencies in modeling and simulation.
  - Collaborate with UCF faculty, alumni, and stakeholders to produce an innovative data center to integrate several fields including data science, cognitive psychology, military, computer science, software engineering, etc. Build towards better integrating human element and design in the use of intelligent machines for training and education.
- **CELLA Project: The Center for Learning and Living with AI** (funded by the Jacobs Foundation):
  - Collaborating with graduate students and postdoctoral fellows and other interdisciplinary researchers from University of Oulu, Finland; University of Technology Munich (TUM), Munich, Germany; Center for Learning Analytics at Monash University, Melbourne, Australia, and Radbound University, Nijmegen, Netherlands.
  - Submitting refereed conference presentations and proceedings, interactive events and demonstrations, and journal manuscripts as lead author or co-author.
  - Training lab members (e.g., undergraduates and graduate students) for project design and multimodal multichannel data research.
  - Collaborate in the design, development, and conducting of classroom-based and laboratory studies on the measurement and modeling of self-regulated learning using multimodal, multichannel data.
  - Contribute to annual reports to the European Association for Research on Learning and Instruction.
- **European Association for Research on Learning and Instruction Emerging Field Group - STEM Teachers' Capacity to Teach Self-Regulated Learning:**

Effectiveness of Extended Reality (funded by the European Association for Research on Learning and Instruction)

- Collaborating with graduate students and postdoctoral fellows and other interdisciplinary researchers from University of Oulu, Finland; Bar-Ilan University, Israel; Bogazici University, Turkey; and Freidrich Schiller University of Jena, Germany to collect multi-channel data (e.g., log-files, screen recordings, concurrent verbalizations) as pre-service teachers interact with a VR game.
- Training lab members (e.g., undergraduate and graduate students) and interdisciplinary collaborators to use the system and analyze data.
- Design and conduct laboratory studies.
- Contribute to annual reports to the Jacobs Foundation.

- **The Effectiveness of Intelligent Virtual Humans in Facilitating Self-Regulated Learning in STEM with MetaTutor** (funded by the National Science Foundation and the Social Sciences and Humanities Research Council of Canada):
  - Collaborating with graduate students and postdoctoral fellows and other interdisciplinary researchers from Psychology and Computer Science at North Carolina State University, LEAD Graduate School and Research Network and University of Tübingen, Multimodal Interaction Lab, Leibniz-Institut für Wissensmedien, Tübingen, Germany to design and test an intelligent multi-agent hypermedia system to collect multi-channel self-regulated learning data (e.g., log-files, facial expressions of emotions, physiological sensors, screen recordings, etc.) and testing their effectiveness on adolescents' and college students' STEM learning (e.g., human biology, microbiology, water quality) and the development of self-regulatory skills using traditional statistics and data mining techniques.
  - Training lab members (e.g., undergraduate and graduate students) and interdisciplinary collaborators to use the system and analyze data.
  - Conducting laboratory studies by testing undergraduate participants as they navigate through the system (including setting up the research tools, such as calibrating the eye tracking, and setting up the audio and video equipment).
  - Submitting refereed conference presentations and proceedings, book chapters, and journal manuscripts as lead author or co-author.
  - Contributing to annual reports for the National Science Foundation.
- **Crystal Island: Improving Science Problem Solving with Adaptive Game-based Reflection Tools** (funded by the National Science Foundation and the Social Sciences and Humanities Research Council of Canada)
  - Collaborating with faculty members, graduate students, research associates, and software developers in Computer Science at North Carolina State University to design studies to examine to examine the effectiveness of Crystal Island, a game-based learning environment that teaches students about science and literacy, on scientific reasoning, developments of self-regulatory skills, and STEM learning.

- Conceptualizing and creating experimental conditions that embody contemporary theories and models of learning from the cognitive and learning sciences to test different elements (e.g., agency, reflection) that may impact cognitive, affective, metacognitive, and motivational self-regulated learning processes while playing different versions of Crystal Island.
- Conducting complex laboratory studies on college students' learning, scientific reasoning, and self-regulation (i.e., proportional learning gains from re- and post-tests, self-report measures of motivation and affect, eye-tracking data of real-time game play and reading comprehension).
- Submitting refereed conference presentations and proceedings, book chapters, and journal manuscripts as lead author or co-author.

- **CRYSTAL ISLAND: REFLECT** (funded by the National Science Foundation):
  - Collaborating with faculty members, graduate students, research associates, and software developers in Computer Science at North Carolina State University to design studies to examine to examine the effectiveness of Crystal Island, a game-based learning environment that teaches students about science and literacy, on scientific reasoning, developments of self-regulatory skills, and STEM learning while scaffolding reflection via written prompts.
  - Conceptualizing and creating reflection tools that embody contemporary theories and models of reflection from the cognitive and learning sciences to test different elements (e.g., reflection) that may impact cognitive, affective, metacognitive, and motivational self-regulated learning processes and scientific reasoning/problem solving while learning with Crystal Island.
  - Conducting complex laboratory studies on college students' learning, scientific reasoning, and self-regulation (i.e., proportional learning gains from re- and post-tests, self-report measures of motivation and affect, eye-tracking data of real-time game play and reading comprehension).
  - Submitting refereed conference presentations and proceedings, book chapters, and journal manuscripts as lead author or co-author.
  - Contributing to annual reports for the National Science Foundation.
- **Future Worlds: Supporting Student Planning with Open Learner Models in Middle Grades Science** (funded by the National Science Foundation):
  - Collaborating with faculty members, graduate students, research associates, and software developers in Computer Science at North Carolina State University to design the learning environment and experimental studies to examine to examine the effectiveness of Future Worlds, a game-based learning environment that uses open-learner models about students' competency in science and literacy, on scientific reasoning, developments of self-regulatory skills, and STEM learning while scaffolding reflection and goal pursuit via tools.
  - Conceptualizing and creating reflection, goal pursuit, and open-learner model tools that embody contemporary theories and models of self-regulation and scientific reasoning from the cognitive and learning sciences

to test different elements (e.g., reflection) that may impact cognitive, affective, metacognitive, and motivational self-regulated learning processes and scientific reasoning/problem solving while learning with Future Worlds.
        - Submitting refereed conference presentations and proceedings, book chapters, and journal manuscripts as lead author or co-author.
        - Contributing to annual reports for the National Science Foundation.

- **Undergraduate Research Assistant** (2016-2017). Department of Psychology; Human Factors, Performance Research Laboratory
  Advisor: Dr. James L. Szalma.
    - **Overall Responsibilities:**
        - Conduct experimental studies to examine developmental aspects of metacognition, pattern recognition, and affect fading bias using ePrime software and self-report items gauging emotions, literacy, and reading comprehension.
        - Data entry using a range of software platforms (e.g., Microsoft Excel).
        - Basic statistical analysis using SPSS; manage data; conduct literature reviews; assist with IRB protocols and conference presentation submission as well as assisting with manuscript preparation as a co-author.
        - Recruiting families to engage in the first development participant pool.
        - Assist with multiple projects including: Understanding Human Performance and Cognitive Capacities, Motivation in Semantic Vigilance Performance, and Autonomous Motivation in Cognitive- and Sensory-based Attentional Performance.

- **Undergraduate Teaching Assistant: Research Methods in Psychology** (2017); Department of Psychology
  Advisor: Dr. Chrysalis Wright.
    - **Overall Responsibilities:**
        - Meet with students during office hours to discuss research design, research questions and hypotheses, literature reviews, and/or methodological and analytical techniques; review research papers; and grade research papers.

SoarTechnology, Inc. (SoarTech)

- Research Associate II (2021-2022). Simulations and Intelligent Learning Systems. *Supervisors:* Dr. Brian Stensrud and Dr. Amanda Bond.
    - **Overall Responsibilities:**
        - Complete literature reviews and background research to support projects and proposal writing efforts; study and analyze information to aid colleagues in determining appropriate courses of action; organize, analyze, and present findings to colleagues for consideration in support of assigned projects; assist in the proposal writing/review process; complete process and data analysis and visualization; attend project/customer meetings.

MEMBERSHIPS

2021 – Present	European Association for Research on Learning and Instruction
2020 – Present	American Educational Research Association
2020 – 2022	Cognitive Science Society
2020 – 2022	Association for Educational Communications & Technologies
2019 – 2022	International Artificial Intelligence in Education Society

COMMITTEES

2021 – 2023	University of Central Florida Graduate Student Advisory Council

INVITED & AD-HOC REVIEWER (JOURNALS, CONFERENCES, AND HANDBOOKS)

2022 - Present	*British Journal of Educational Technology,* Ad-hoc reviewer
2022 - Present	*Metacognition and Learning,* Ad-hoc reviewer
2021 - Present	*International Society of the Learning Sciences,* Conference reviewer
2020 – Present	*American Educational Research Association*, Conference reviewer
2020 – Present	*Association for Educational Communications & Technology*, Conference reviewer
2020 – Present	*European Association for Research on Learning and Instruction*, Conference reviewer
2023	*Learning and Instruction,* Ad-hoc reviewer
2023	*International Journal of AI in Education*, Ad-hoc reviewer
2022	*European Association for Research on Learning and Instruction,* Conference reviewer
2022	*Theory and Learning Analytics,* Ad-hoc reviewer
2021	*Computers in Human Behavior,* Ad-hoc reviewer
2020	*Discourse Processes: Special Issue on Emotions in Reading, Learning and Communication*, Ad-hoc reviewer

DESIGNING AND DEVELOPING ADVANCED LEARNING TECHNOLOGIES

2023 – Present **Outbreak Simulator:**

Postdoctoral researcher contributing to an interdisciplinary project (PI: Dr. Barrie Robison, University of Idaho, Department of Biological Sciences) in developing an innovative game-based learning environment which aims at detecting and remediating K-12 students' misconceptions about infectious diseases, such as COVID-19. This game environment uses digital tools to build students' systems thinking and data science literacy skills that are essential for understanding how infectious diseases spread while detecting, using multimodal data, how learners demonstrate misconceptions and lack of microbiology knowledge and how learners' conceptions of infectious disease spread evolves over time through directly manipulating

environmental factors contributing to computational models and observing how the spread changes because of those factors.

2019 – 2023 **Crystal Island REFLECT:**

Graduate research assistant contributing to an interdisciplinary project in collaboration with faculty, graduate students, and postdoctoral fellows at North Carolina State (PI: Dr. James Lester; Co-PI: Dr. Roger Azevedo) Crystal Island REFLECT is a game-based learning environment built to enhance scientific reasoning, problem solving, and learning about STEM topics using tools that scaffold reflection. Specifically, reflection is scaffolded using written prompts that are triggered based on event- and time-based production rules. The production rules are built off of on-line behavioral traces that represent actions critical for problem solving and scientific reasoning in order to be successful in completing the game.

2018 – Present **Future Worlds:**

Graduate research assistant contributing to an interdisciplinary project (PI: Dr. James Lester, North Carolina State University, Department of Computer Science; Co-PIs: Dr. Roger Azevedo, UCF Department of Learning Sciences and Educational Research, Dr. Jonathan Rowe, North Carolina State University, Intellimedia Group. Future Worlds is a hypermedia-based learning environment with open-learner models built to enhance learners' self-regulation and reflection using tools and open-learner models while solving environmental and sustainability problems.

COMMUNITY OUTREACH

November 2022 **NeoCity Academy Modeling & Simulation Workshop:**

I was a co-organizer of a workshop hosted at UCF's School of Modeling, Simulation and Training to expose students to research and development within the modeling and simulation field. This workshop focused on demonstrating and developing research opportunities within the field of modeling and simulation to students and teachers from NeoCity Academy who represent several ethnic, socioeconomic, linguistic, and cultural backgrounds. During this workshop, students were exposed to several different learning technologies including a game-based learning environment about microbiology and virtual reality system on chemistry lab skills. Students were then escorted to various modeling and simulation labs throughout the School of Modeling, Simulation, and Training.

April 2023 **Hagerty High School Modeling & Simulation Workshop:**

I organized a full-day workshop hosted at UCF's School of Modeling, Simulation, and Training that conducted an array of opportunities for students at Hagerty High School, a local high school in Central Florida with a modeling and simulation program, to be exposed to various uses of modeling and simulation. Students were able to experience how data can be collected within an intelligent tutoring system that incorporates adaptive scaffolding techniques, interacted with a game-based learning environment for understanding environmental health, and taught about the benefits and limitations of AI using ChatGPT. Students who attended the workshop were then exposed to how data was collected within advanced learning technologies and were provided real student data to analyze and visualize using Looker Studio from Google. A panel of students from the Modeling and Simulation program at UCF presented their own work and provided career and educational advice to the high school students.

AWARDS

2022	Order of the Pegasus Nominee: University of Central Florida, Orlando, FL
2022	UCF Graduate Dean's Dissertation Completion Fellowship (**$10,000**): University of Central Florida, Orlando, FL
2022	International Conference for Artificial Intelligence in Education Best Student Paper (€**1,000**)
2021	Leonard P. Gollobin Postgraduate I/ITSEC Scholarship **($15,000)**
2020	Presentation Fellowship **($150)**: College of Graduate Studies, University of Central Florida, Orlando, FL
2020	Virtual Research Showcase Honorable Mention: College of Community Innovation and Education, University of Central Florida, Orlando, FL

CERTIFICATIONS

CITI Human Subjects Research- Group Social/Behavioral Research Investigators and Key Personnel (Last Renewed 8.10.21).

SOFTWARE

R (proficient), IBM SPSS (proficient), iMotions (proficient), LaTeX (proficient), Microsoft Office (proficient), Qualtrics (proficient), AnyLogic Simulation Software (familiar), HLM (familiar), MATLAB (novice), Python (familiar), SAS (familiar), SQL (novice).