Curriculum Vitae

CONTACT INFORMATION

Prof. Dr. Martina Rau
Chair of Research on Learning and Instruction

Department of Humanities, Social and Political Sciences
Federal Institute of Technology (ETH) Zurich
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PERSONAL INFORMATION

Date of birth: 12/30/1984
Birthplace: Groß-Umstadt, Germany
Citizenship: Germany
1 child, born 2020

FORMAL EDUCATION

2010 - 2013 Human-Computer Interaction HCI Institute, Carnegie Mellon University, Pittsburgh, PA, USA;
Degree: Ph.D.;
Ph.D. Certificates from Associate in Program for Interdisciplinary Education Research (PIER) and from the Pittsburgh Science of Learning Center (PSLC).
Thesis title: *Conceptual learning with multiple graphical representations: Intelligent tutoring systems support for sense-making and fluency-building processes.*

2008 - 2010 Human-Computer Interaction Institute, Carnegie Mellon University, Pittsburgh, PA, USA
Degree: Master of Science

2004 - 2009 Psychology at the Albert-Ludwigs-University Freiburg, Germany;
Degree: Dipl.-Psych., equivalent to combined Bachelor and Master of Science

LANGUAGES

German: native
English: fluent
French: upper intermediate

ACADEMIC POSITIONS

Since 2023 Full Professor, Chair of Research on Learning and Instruction in the Department of Humanities, Social and Political Sciences, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland

2022 - 2023 Chair of the Learning Sciences Program in the Department of Educational Psychology, University of Wisconsin – Madison, USA

2019 - 2023 Associate Professor in the Department of Educational Psychology,

University of Wisconsin – Madison, USA

2014 - 2023 Affiliate Professor in the Department of Computer Sciences, University of Wisconsin – Madison, USA

2013 - 2023 Director of the Learning, Representations, & Technology Lab, University of Wisconsin – Madison, USA

2013 - 2023 Principal Investigator at the Wisconsin Center for Education Research, University of Wisconsin – Madison, USA

2013 - 2019 Assistant Professor in the Department of Educational Psychology, University of Wisconsin – Madison, USA

HONORS & AWARDS

2022 Ranked 6th most productive educational psychologists and 2nd most productive early career scholar (when considering lead authorship position in articles; see Tables 3 and 5 in Fong, C. J., Flanigan, A. E., Hogan, E., Brady, A. C., Griffin, M. M., Gonzales, C., ... & Robinson, D. H. (2022). Individual and Institutional Productivity in Educational Psychology Journals from 2015 to 2021. *Educational Psychology Review*, 1-25.)

2021 International Society of the Learning Sciences Early Career Award, awarded to exceptionally outstanding and innovative contributions of scholarly activities in the early stages of their career.

2021 Fellow of the Teaching Academy at the University of Wisconsin – Madison, awarded to individuals who have demonstrated teaching excellence.

2019 NAEd/Spencer Postdoctoral Fellowship

2018 Best Student Paper Nomination at the 13th International Conference of the Learning Sciences (ICLS 2018), with doctorate student Sally Wu

2018 NAEd/Spencer Postdoctoral Fellowship Semifinalist

2018 VIP (Visiting International Professor) fellowship by the Ruhr-Universität Bochum, Germany to outstanding scientists from around the globe to foster long-lasting international collaborations.

2017 CAREER award by the National Science Foundation

2016 Best Paper Nomination at the 9th International Conference on Educational Data Mining (EDM 2016)

2013 Best Paper Nomination at the 2013 SIGCHI Conference on Human Factors in Computing Systems (CHI 2013)

2013 Best Paper Award at the 6th International Conference on Educational Data Mining (EDM 2013)

2013 Siebel Scholar, Class of 2013: Awarded annually for academic excellence and demonstrated leadership to 85 top students from the world's leading graduate schools.

2009 Best Student Paper Award at the 14th International Conference on Artificial Intelligence in Education (AIED 2009)

PUBLICATIONS

(bold indicates my own name; italicized names indicate students)

Publications in Journals (peer reviewed)

1. *Sung, H.*, **Rau, M. A.** & Van Veen, B. (in press). Development of an intelligent tutoring system that assesses internal visualization skills in engineering using multimodal triangulation. *IEEE Transactions on on Learning Technologies, 17*, 1625-1638. https://doi.org10.1109/TLT.2024.3396393
2. *Stahl, C.*, **Rau, M. A.**, & Greenberg, J. A. (2023). Teaching advanced surgical anatomy with visual representations: comparing perceptual fluency and sense making. *Instructional Science, 51*(4), 661-686. https://doi.org/10.1007/s11251-023-09630-y
3. **Rau, M. A.** & *Beier, J.* (2023). Exploring the effects of gesture-based collaboration on students' benefit from a perceptual training. *Journal of Educational Psychology, 115*(2), 267-289.
4. *Herder, T.* & **Rau, M. A.** (2022). Representational-competency supports in an educational video game for undergraduate astronomy. *Computers & Education, 190*, 104602.
5. *Herder, T.,* & **Rau, M. A.** (2022). The role of representational competencies for students' learning from an educational video game for astronomy. *Frontiers in Education, 7,* 919645. https://doi.org/10.3389/feduc.2022.919645
6. *Dorris, M.* & **Rau, M. A.** (2022). Conceptual challenges exhibited by naïve undergraduate students in the context of atomic orbital energy diagrams. *Journal of Chemical Education, 99*(8), 2777-2786.
7. **Rau, M. A.** & *Herder, T.* (2021). Under which conditions are physical vs. virtual representations effective? Contrasting conceptual and embodied mechanisms of learning. *Journal of Educational Psychology 113*(8), 1565–1586. https://doi.org/10.1037/edu0000689
8. **Rau, M. A.**, *Zahn, M.*, Misback, E., *Herder, T.*, & Burstyn, J. (2021). Adaptive support for representational competencies during technology-based problem solving in chemistry. *Journal of the Learning Sciences, 30*(2), 163-203. https://doi.org/10.1080/10508406.2021.1888733
9. *Wu, S. P.*, VanVeen, B. & **Rau, M. A.** (2020). How drawing prompts can increase cognitive engagement in an active learning engineering course. *Journal of Engineering Education*, *109*(4), 723-742. https://doi.org/10.1002/jee.20354
10. Donhauser, A., Küchemann, S., Kuhn, J., **Rau, M.**, Malone, S., Edelsbrunner, P., & Lichtenberger, A. (2020). Making the invisible visible: Visualization of the connection between magnetic field, electric current, and Lorentz force with the help of augmented reality. *The Physics Teacher, 58*(6), 438-439. https://doi.org/10.1119/10.0001848
11. **Rau, M. A.,** Keesler, W., Zhang, Y., & *Wu, S.* (2020). Resolving design tradeoffs of interactive visualization tools for educational technologies. *IEEE Transactions on Learning Technologies, 13*(2), 326-339. https://doi.org/10.1109/TLT.2019.2902546
12. **Rau, M. A.,** (2020). Comparing multiple theories about learning with physical and virtual representations: Conflicting or complementary effects? *Educational Psychology Review, 32*, 297-325. https://doi.org/10.1007/s10648-020-09517-1
13. *Mason, B.*, **Rau, M. A.**, & Nowak, R. (2019). Modeling implicit knowledge about visual representations with similarity learning methods. *Cognitive Science, 43*(9), e12744.

https://doi.org/10.1111/cogs.12744

14. *Wu, S. P.*, & **Rau, M. A.** (2019). How students learn content in science, technology, engineering, and mathematics (STEM) through drawing activities. *Educational Psychology Review, 31*(1), 87-120. https://doi.org/10.1007/s10648-019-09467-3
15. *Wu, S. P., Corr, J. &* **Rau, M. A.** (2019). How instructors frame students' interactions with educational technologies can enhance or reduce learning with multiple representations. *Computers & Education, 128*, 199-213. https://doi.org/10.1016/j.compedu.2018.09.012
16. **Rau, M. A.**, & *Wu, S. P. W.* (2018). Combining instructional activities for sense-making processes and perceptual-induction processes involved in connection-making among multiple visual representations. *Cognition and Instruction, 36*(4), 361-395. https://doi.org/10.1080/07370008.2018.1494179
17. **Rau, M. A.** (2018a). Making connections among multiple visual representations: How do sense-making competencies and perceptual fluency relate to learning of chemistry knowledge? *Instructional Science, 46*(2), 209-243. https://doi.org/10.1007/s11251-017-9431-3
18. **Rau, M. A.** (2018b). Sequencing sense-making support and fluency-building support for connection making among multiple visual representations. *Journal of Educational Psychology, 110*(6), 811-833. https://doi.org/10.1037/edu0000229
19. *Wu, S. P. W.,* & **Rau, M. A.** (2018). The effectiveness and efficiency of adding drawing prompts to an interactive educational technology when learning with conventional visual representations. *Learning and Instruction, 55*, 93-104. https://doi.org/10.1016/j.learninstruc.2017.09.010
20. **Rau, M. A.** (2017). Conditions for the effectiveness of multiple visual representations in enhancing STEM learning. *Educational Psychology Review, 29*(4), 717–761. https://doi.org/10.1007/s10648-016-9365-3
21. **Rau, M. A.** (2017). A framework for discipline-specific grounding of educational technologies with multiple visual representations. *IEEE Transactions on Learning Technologies, 10*(3), 290-305. https://doi.org/10.1109/TLT.2016.2623303
22. **Rau, M. A.** (2017). How do students learn to see concepts in visualizations? Social learning mechanisms with physical and virtual representations. *Journal of Learning Analytics, 4*(2), 240–263. https://doi.org/10.18608/jla.2017.42.16
23. **Rau, M. A.** (2017). Do knowledge-component models need to incorporate representational competencies? *International Journal of Artificial Intelligence in Education*, 27(2), 298-319. https://doi.org/10.1007/s40593-016-0134-8
24. **Rau, M. A.,** Aleven, V., & Rummel, N. (2017). Making connections among multiple graphical representations of fractions: sense-making competencies enhance perceptual fluency, but not vice versa. *Instructional Science, 45*(3), 331-357. https://doi.org/10.1007/s11251-017-9403-7
25. **Rau, M. A.,** Aleven, V., & Rummel, N. (2017). Supporting students in making sense of connections and in becoming perceptually fluent in making connections among multiple graphical representations. *Journal of Educational Psychology, 109*(3), 355-373. https://doi.org/10.1037/edu0000145
26. **Rau, M. A.**, *Bowman, H. E.*, & Moore, J. W. (2017). An adaptive collaboration script

for learning with multiple visual representations. *Computers & Education, 109*(C), 38-55. https://doi.org/10.1016/j.compedu.2017.02.006

27. **Rau, M. A.**, & Matthews, P. G. (2017). How to make 'more' better? Principles for effective use of multiple representations to enhance student learning. *ZDM - Mathematics Education. 49*(4), 491-496. https://doi.org/10.1007/s11858-017-0846-8
28. **Rau, M. A.**, *Kennedy, K., Oxtoby, L., Bollom, M.,* & Moore, J., (2017). Unpacking "active learning" interventions: A combination of flipped classroom and collaboration support is more effective but collaboration support alone is not. *Journal of Chemical Education, 94*(10), 1406–1414. https://doi.org/10.1021/acs.jchemed.7b00240
29. **Rau, M. A.** (2015). Enhancing undergraduate chemistry learning by helping students make connections among multiple graphical representations. *Chemistry Education Research and Practice, 16*, 654-669. https://doi.org/10.1039/C5RP00065C
30. **Rau, M. A.**, Aleven, V., & Rummel, N. (2015). Successful learning with multiple graphical representations and self-explanation prompts. *Journal of Educational Psychology, 107*(1), 30-46. https://doi.org/10.1037/a0037211
31. **Rau, M. A.**, *Michaelis, J. E.*, & *Fay, N.* (2015). Connection making between multiple graphical representations: A multi-methods approach for domain-specific grounding of an intelligent tutoring system for chemistry. *Computers and Education*, 82, 460-485. https://doi.org/10.1016/j.compedu.2014.12.009
32. **Rau, M. A.**, Aleven, V., Rummel, N., & Pardos, Z. (2014). How should intelligent tutoring systems sequence multiple graphical representations of fractions? A Multi-Methods Study. *International Journal of Artificial Intelligence in Education*, 24(2), 125-161. https://doi.org/10.1007/s40593-013-0011-7
33. **Rau, M. A.**, Aleven, V., & Rummel, N. (2013). Interleaved practice in multi-dimensional learning tasks: which dimension should we interleave? *Learning and Instruction*, 23, 98-114. https://doi.org/10.1016/j.learninstruc.2012.07.003

Publications in Proceedings (peer reviewed)

34. *Rho, J.*, **Rau, M. A.**, Bharti. S. K., Luu. R., McMahan. J., Wang. A., & Zhu, J. (2024). Various misleading visual features in misleading graphs: Do they truly deceive us? *Proceedings of the Annual Meeting of the Cognitive Science Society*, 46.
35. *Rho, J.,* **Rau, M. A.**, & Van Veen, B. D. (2023). Preparing collaborative future learning with representational-competency supports. In Blikstein, P., Van Aalst, J., Kizito, R., & Brennan, K. (Eds.), *Proceedings of the 17th International Conference of the Learning Sciences - ICLS 2023 (pp. 43-50). International Society of the Learning Sciences.*
36. *Beier, J. P.*, & **Rau, M. A.** (2022). Embodied learning with physical and virtual manipulatives in an intelligent tutor for chemistry. In V. Dimitrova, N. Matsuda, & M. M. D. T. Rodrigo (Eds.), *Artificial Intelligence in Education. AIED 2022. Lecture notes in computer science* (pp. 103-114). Springer.
37. *Herder, T.*, & **Rau, M. A.** (2022). Supporting representational competencies in an educational video game: What does and doesn't work. In V. Dimitrova, N. Matsuda, & M. M. D. T. Rodrigo (Eds.), *Artificial Intelligence in Education. AIED 2022. Lecture notes in computer science* (pp. 280-283). Springer.
38. **Rau, M. A.**, & *Zahn, M.* (2022). Nonverbal collaboration on perceptual learning activities with chemistry visualizations. In V. Dimitrova, N. Matsuda, & M. M. D. T. Rodrigo

(Eds.), *Artificial Intelligence in Education. AIED 2022. Lecture notes in computer science* (pp. 231-235). Springer.

39. *Rho, J.*, **Rau, M. A.** & VanVeen, B. (2022). Preparing future learning with novel visuals by support-ing representational competencies. In V. Dimitrova, N. Matsuda, & M. M. D. T. Rodrigo (Eds.), *Artificial Intelligence in Education. AIED 2022. Lecture notes in computer science* (pp. 66-77). Springer.
40. *Rho, J.*, **Rau, M. A.**, & VanVeen, B. (2022). Investigating growth of representational competencies by knowledge-component model. In A. I. Cristea & C. Brown (Eds.), *Proceedings of the 15th International Conference on Educational Data Mining (EDM 2022)* (pp. 346-352). International Educational Data Mining Society.
41. *Beier, J. P.*, & **Rau, M. A.** (2022). The role of visual representations in impasses during collaborative problem solving in undergraduate chemistry. In Chinn, C., Tan, E., Chan, C., & Kali, Y. (Eds.). *Proceedings of the 16th International Conference of the Learning Sciences - ICLS 2022* (pp. 1888-1889). International Society of the Learning Sciences.
42. *Ramly, C. M., Sen, A., Kale, V. P.,* **Rau, M. A.**, & Zhu, X. (2021). Digitally training graph viewers against misleading bar charts. In *Proceedings of the 43rd annual meeting of the Cognitive Science Society, CogSci 2021* (pp. 1928-1934). Lawrence Erlbaum.
43. **Rau, M. A.**, Moore, J. & Burstyn, J. (2020). Do affordances of classroom furniture affect learning in undergraduate active-learning courses? In M. Gresalfi & I. S. Horn (Eds.), *The interdisciplinarity of the Learning Sciences (ICLS) 2020* (Vol. 2, pp. 967-974). International Society of the Learning Sciences.
44. **Rau, M. A.**, *Sen, A.*, & Zhu, X. (2019). Using machine learning to overcome the expert blind spot for perceptual fluency trainings. In M. E. Isotani S., Ogan A., Hastings P., McLaren B., Luckin R. (Ed.), *Artificial Intelligence in Education. AIED 2019. Lecture notes in computer science* (Vol. 11625, pp. 406-418). Springer.
45. **Rau, M. A.**, & *Schmidt, T.* (2019). Disentangling conceptual and embodied mechanisms for learning with virtual and physical Representations. In M. E. Isotani S., Ogan A., Hastings P., McLaren B., Luckin R. (Ed.), *Artificial Intelligence in Education. AIED 2019. Lecture notes in computer science* (Vol. 11625, pp. 419-431). Springer.
46. **Rau, M. A.**, *Zahn, M.*, Misback, E., & Burstyn, J. (2019). Adaptive support for representation skills in a chemistry ITS is more effective than static support. In M. E. Isotani S., Ogan A., Hastings P., McLaren B., Luckin R. (Ed.), *Artificial Intelligence in Education. AIED 2019. Lecture notes in computer science* (Vol. 11625, pp. 432-444). Springer.
47. **Rau, M. A.**, & *Patel, P.* (2018). A collaboration script for nonverbal communication enhances perceptual fluency with visual representations. In J. Kay & R. Luckin (Eds.), *Rethinking learning in the digital age. Making the Learning Sciences count (ICLS) 2018* (Vol. 1, pp. 272-279). International Society of the Learning Sciences.
48. **Rau, M. A.**, & *Zahn, M.* (2018). Sequencing support for sense making and perceptual fluency with visual representations: Is there a learning progression? In J. Kay & R. Luckin (Eds.), *Rethinking learning in the digital age. Making the Learning Sciences count (ICLS) 2018* (Vol. 1, pp. 264-271). International Society of the Learning Sciences.
49. *Sen, A., Purav, P.*, **Rau, M.A.**, *Mason, B.*, Nowak, R., Rogers, T., & Zhu, X. (2018). Machine beats human at finding the optimal sequence of visual representations for

students' learning of perceptual fluency. In K. E. Boyer & M. Yudelson (Eds.), *Proceedings of the 11th International Conference on Educational Data Mining* (pp. 137-146). International Educational Data Mining Society.

50. *Wu, S. P. &* **Rau, M. A.** (2018). Collaboration scripts should focus on shared models, not on drawings, to help students translate between representations. In J. Kay & R. Luckin (Eds.), *Rethinking learning in the digital age. Making the Learning Sciences count (ICLS) 2018* (Vol. 1, pp. 504-511). International Society of the Learning Sciences. **Best Student Paper Nomination.**
51. **Rau, M. A.**, & *Wu, S. P. W.* (2017). Educational technology support for collaborative learning with multiple visual representations in chemistry. In B. K. Smith, M. Borge, E. Mercier & K. Y. Lim (Eds.), *Making a difference: Prioritizing equity and access in CSCL, 12th International Conference on Computer Supported Collaborative Learning (CSCL) 2017* (Vol. 1, pp. 79-86). International Society of the Learning Sciences.
52. Sharma, K., Jermann, P., Dillenbourg, P., **Rau, M.**, Pardos, Z., Schneider, B., D'Angelo, S., Gergle, D., & Prieto, L. (2017). CSCL and eye-tracking: Experiences, opportunities and challenges. In B. K. Smith, M. Borge, E. Mercier & K. Y. Lim (Eds.), *Making a difference: Prioritizing equity and access in CSCL, 12th International Conference on Computer Supported Collaborative Learning (CSCL) 2017* (Vol. 2, pp. 727-734). International Society of the Learning Sciences.
53. *Wu, S. P. W.*, & **Rau, M. A.** (2017). How technology and collaboration promote formative feedback: A role for CSCL research in active learning interventions. In B. K. Smith, M. Borge, E. Mercier & K. Y. Lim (Eds.), *Making a difference: Prioritizing equity and access in CSCL, 12th International Conference on Computer Supported Collaborative Learning (CSCL) 2017* (Vol. 1, pp. 279-286). International Society of the Learning Sciences.
54. **Rau, M. A.** (2016). Social, perceptual, and conceptual factors of learning with multiple external representations in educational technologies. In C.-K. Looi, J. Polman, U. Cress & P. Reimann (Eds.), *Proceedings of the International Conference of the Learning Sciences (ICLS) 2016* (Vol. 2, pp. 1378-1379). International Society of the Learning Sciences.
55. **Rau,** M. A. (2016). Pattern mining uncovers social prompts of conceptual learning with physical and virtual representations. In S. Barnes, M. Chi & M. Feng (Eds.), *Proceedings of the 9th International Conference on Educational Data Mining* (pp. 478-483). International Educational Data Mining Society.
56. **Rau, M. A.**, *Mason, B.*, & Nowak, R. (2016). How to model implicit knowledge? Use of metric learning to assess student perceptions of visual representations. In T. Barnes, M. Chi & M. Feng (Eds.), *Proceedings of the 9th International Conference on Educational Data Mining (EDM 2016)* (pp. 199-206). Raleigh, NC: International Educational Data Mining Society. **Best Paper Nomination.**
57. **Rau, M. A.**, & Pardos, Z. A. (2016). Adding eye-tracking AOI data to models of representation skills does not improve prediction accuracy. In S. Barnes, M. Chi & M. Feng (Eds.), *Proceedings of the International Conference on Educational Data Mining (EDM 2016)* (pp. 622-623). International Educational Data Mining Society.
58. **Rau, M. A.**, *Wu, S. P., & Schuberth, J.* (2016). Sequencing physical representations with human tutors and virtual representations with a computer tutor in chemistry. In C.-K. Looi, J. Polman, U. Cress & P. Reimann (Eds.), *Proceedings of the International*

Conference of the Learning Sciences (ICLS) 2016 (Vol. 2, pp. 1173-1174). International Society of the Learning Sciences.

59. *Peterson, J.,* Pardos, Z., **Rau, M. A.**, *Swigart, A., Gerber, C., & McKinsey*, *J.* (2015). Understanding student success in chemistry using gaze tracking and pupillometry. In C. Conati, N. Heffernan, A. Mitrovic & M. F. Verdejo (Eds.), *Artificial Intelligence in Education. AIED 2015. Lecture notes in computer science* (pp. 358–366). Springer.
60. **Rau, M. A.** (2015). Why do the rich get richer? A structural equation model to test how spatial skills affect learning with representations. In J. G. Boticario, O. C. Santos, C. Romero, M. Pechenizkiy, A. Merceron, P. Mitros, J. M. Luna, C. Mihaescu, P. Moreno, A. Hershkovitz, S. Ventura & M. Desmarais (Eds.), *Proceedings of the 8th International Conference on Educational Data Mining (EDM 2015)* (pp. 350-357). International Educational Data Mining Society.
61. **Rau, M. A.**, & *Wu, S. P. W.* (2015). ITS support for conceptual and perceptual processes in learning with multiple graphical representations. In C. Conati, N. Heffernan, A. Mitrovic & M. F. Verdejo (Eds.), *Artificial Intelligence in Education. AIED 2015. Lecture notes in computer science* (pp. 398–407). Springer.
62. **Rau, M. A.**, & *Evenstone, A. L.* (2014). Multi-methods approach for domain-specific grounding: An ITS for connection making in chemistry. In S. Trausan-Matu et al. (Ed.), *Proceedings of the 12th International Conference on Intelligent Tutoring Systems* (pp. 426-435). Springer.
63. **Rau, M. A.**, Aleven, V., & Rummel, N. (2014). Sequencing sense-making and fluency-building support for connection making between multiple graphical representations. In J. L. Polman, E. A. Kyza, D. K. O'Neill, I. Tabak, W. R. Penuel, A. S. Jurow, K. O'Connor, T. Lee & L. D'Amico (Eds.), *Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014* (Vol. 2, pp. 977-981). International Society of the Learning Sciences.
64. **Rau, M. A.**, Aleven, V., Rummel, N., & Rohrbach, S. (2013). Why interactive learning environments can have it all: Resolving design conflicts between competing stakeholder goals. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 109-118). ACM. **Best Paper Nomination.**
65. **Rau, M. A.**, Aleven, V., & Rummel, N. (2013). Complementary effects of sense-making and fluency-building support for connection making: A matter of sequence? In H. C. Lane, K. Yacef, J. Mostow & P. Pavlik (Eds.), *Artificial Intelligence in Education. AIED 2013. Lecture notes in computer science* (pp. 329-338). Springer.
66. **Rau, M. A.**, Aleven, V., & Rummel, N. (2013). How to use multiple graphical representations to support conceptual learning? Research-based principles in the Fractions Tutor. In H. C. Lane, K. Yacef, J. Mostow & P. Pavlik (Eds.), *Artificial Intelligence in Education. AIED 2013. Lecture notes in computer science* (pp. 762-765). Springer.
67. **Rau, M. A.**, Scheines, R., Aleven, V., & Rummel, N. (2013). Does representational understanding enhance fluency or vice versa? Searching for mediation models. In S. K. D'Mello, R. A. Calvo & A. Olney (Eds.), *Proceedings of the 6th International Conference on Educational Data Mining (EDM 2013)* (pp. 161-169). Memphis, TN: International Educational Data Mining Society. **Best Paper Award.**
68. Carlson, R., Genin, K., **Rau, M.**, & Scheines, R. (2013). Student profiling from tutoring system log data: When do multiple graphical representations matter? In S. K. D'Mello, R. A. Calvo & A. Olney (Eds.), *Proceedings of the 6th International Conference on Educational Data Mining (EDM 2013)* (pp. 12-20). International Educational

Data Mining Society.

69. Hayashi, E., **Rau, M. A.**, Neo, Z. H., Tan, N., Ramasubramanian, S., & Paulos, E. (2012). TimeBlocks: mom, can I have another block of time? *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1713-1716). ACM.
70. Matlen, B., Atit, K., Goksun, T., **Rau, M.**, & Ptouchkina, M. (2012). Representing space: Exploring the relationship between gesturing and geoscience understanding in children. In C. Stachniss, K. Schill & D. Uttal (Eds.), *Spatial Cognition VIII* (Vol. 7463, pp. 405-415). Springer.
71. **Rau, M.**, Aleven, V., Rummel, N., & Rohrbach, S. (2012). Sense making alone doesn't do it: Fluency matters too! ITS support for robust learning with multiple representations. In S. Cerri, W. Clancey, G. Papadourakis & K. Panourgia (Eds.), *Intelligent Tutoring Systems* (Vol. 7315, pp. 174-184). Springer.
72. **Rau, M. A.**, & Pardos, Z. A. (2012). Interleaved practice with multiple representations: Analyses with knowledge tracing based techniques. In Yacef, K., Zaïane, O., Hershkovitz, H., Yudelson, M., and Stamper, J. (Eds.), *Proceedings of the 5th International Conference on Educational Data Mining (EDM 2012)*. (pp. 168-171). International Educational Data Mining Society.
73. **Rau, M. A.**, & Scheines, R. (2012). Searching for variables and models to investigate mediators of learning from multiple representations. In Yacef, K., Zaïane, O., Hershkovitz, H., Yudelson, M., and Stamper, J. (Eds.), *Proceedings of the 5th International Conference on Educational Data Mining (EDM 2012*. (pp. 110-117). International Educational Data Mining Society.
74. **Rau, M.**, Rummel, N., Aleven, V., Pacilio, L., & Tunc-Pekkan, Z. (2012). How to schedule multiple graphical representations? A classroom experiment with an intelligent tutoring system for fractions. In J. van Aalst, K. Thompson, M. J. Jacobson & P. Reimann (Eds.), *The future of learning: Proceedings of the 10th International Conference of the Learning Sciences (ICLS 2012)* – Volume 1, Full Papers (pp. 64-71). International Society of the Learning Sciences.
75. Feenstra, L., Aleven, V., Rummel, N., **Rau, M. A.**, & Taatgen, N. (2011). Thinking with your hands: Interactive graphical representations in a tutor for fractions learning. *Artificial Intelligence in Education. AIED 2011. Lecture Notes in Computer Science* (pp. 453-455). Springer.
76. **Rau, M. A.**, Aleven, V., & Rummel, N. (2010). Blocked versus interleaved practice with multiple representations in an intelligent tutoring system for fractions. In V. Aleven, J. Kay, & J. Mostow (Eds.), *Proceedings of the 10th International Conference of Intelligent Tutoring Systems* (pp. 413-422). Springer.
77. **Rau, M. A.**, Aleven, V., & Rummel, N. (2009). Intelligent tutoring systems with multiple representations and self-explanation prompts support learning of fractions. In V. Dimitrova, R. Mizoguchi, & B. du Boulay (Eds.), *Proceedings of the 14th International Conference on Artificial Intelligence in Education* (pp. 441-448). IOS Press. **Best Student Paper Award.**

Chapters in Books and Pre-Prints

78. *Bharti, S.*, *Cheng, S.*, *Rho, J.*, **Rau, M.**, & Zhu, X. (2024). CHARTOM: A Visual Theory-of-Mind Benchmark for Multimodal Large Language Models. arXiv preprint arXiv:2408.14419.
79. Koedinger, K. R., **Rau, M. A.**, & McLaughlin, E. A. (2023). Different goals imply different methods: A guide to adapting instructional methods to your context. In C. E.

Overson, C. M. Hakala, L. L. Kordonowy, & V. A. Benassi (Eds.), *In their own words: What scholars want you to know about why and how to apply the science of learning in your academic setting* (303-315). Society for the Teaching of Psychology.

80. **Rau, M. A.** (2022). Adaptive support for representational competencies during technology-based problem solving in STEM. Jiao, P., McLaren, B., Alavi, A. H., Ouyang, F. (Eds.), *Artificial intelligence in STEM education: The paradigmatic shifts in research, education, and technology.* CRC Press Taylor & Francis Group.
81. **Rau, M. A.** (2020). Cognitive and socio-cultural theories on competencies and practices involved in learning with multiple representations. Van Meter, P., List, A., Lombardi, D., & Kendeou (Eds.), *Handbook of learning from multiple representations and perspectives.* Routledge.
82. **Rau, M. A.** & Moore, J. (2020). Flipped classrooms and collaborative support in chemistry. Mintzes, J. J. & Walter, E. M. (Eds.), *Active learning in college science: The case for evidence-based practice* (pp. 567-582). Springer.
83. **Rau, M. A.** (2018). Supporting representational competences through adaptive educational technologies. In K. Halverson Daniel (Ed.), *Towards a framework for representational competence in science education* (pp. 103-132). Springer.
84. **Rau, M. A.** (2016). Supporting students' learning with multiple visual representations. In J. C. Horvath, J. Lodge & J. A. C. Hattie (Eds.), *From the laboratory to the classroom: Translating the learning sciences for teachers* (pp. 155-171). Routledge.

RESEARCH SUPPORT

2022 - 2025 Principal Investigator on: *Digitally inoculating viewers against visual misinformation with a perceptual training*, together with Co-Investigator Jerry Zhu (University of Wisconsin – Madison, Department of Computer Sciences);
Funder: National Science Foundation (USA), Research on Emerging Technologies for Teaching and Learning (RETTL), #2202457;
Amount: **$849,761.**
Description: The project builds on prior research on representational competencies to develop and test the effectiveness of a perceptual training that teaches viewers to recognize misleading graphs and to adjust their perception of these graphs accordingly.

2019 - 2023 Principal Investigator on: *Learning internal visualization skills for complex engineering concepts in active learning classes*, together with Co-Investigator Barry VanVeen (University of Wisconsin – Madison, Department of Electrical and Computer Engineering);
Funder: National Science Foundation (USA), Improving Undergraduate STEM Education (IUSE), #1933078;
Amount: **$300,000.**
Description: This project investigates whether support for representational competencies enables students to internally visualize complex engineering concepts that are presented via symbolic representations.

2020 - 2023 Co-Investigator on: *An investigation of the use of representations in early childhood*, together with Principal Investigator Hala Ghouseeini (University of Wisconsin – Madison, Department of Curriculum and Instruction);
Funder: Center for Research on Early Childhood Education, University of

Wisconsin – Madison (USA);
Amount: **$29,997.**
Description: This project seeks to understand how young students (age 4-6) use representations in early mathematics experiences and how teachers support students' use of representations.

2017 - 2023 Principal Investigator on: *CAREER: Intelligent representations: How to blend physical and virtual representations by adapting to the individual student's needs in real time*;
Funder: National Science Foundation (USA), Cyberlearning, #1651781;
Amount: **$598,399.**
Description: This project investigates the complementary strengths of tangible and virtual representations to leverage conceptual and haptic learning experiences to enhance high-school and college students' learning of foundational chemistry concepts.

2019 - 2021 Principal Investigator on: *Collaboration support for learning with visual representations in undergraduate chemistry*;
Funder: National Academy of Education (USA) / Spencer Postdoctoral Fellowship;
Amount: **$70,000.**
Description: This project compared individual to collaborative learning to reveal whether and how collaboration affects students' benefit from supports for representational competencies, and how this affects domain learning.

2016 - 2019 Principal Investigator on: *EXP: Modeling perceptual fluency with visual representations in an intelligent tutoring system for undergraduate chemistry*, together with Co-Investigators Jerry Zhu (University of Wisconsin – Madison, Department of Computer Sciences) and Rob Nowak (University of Wisconsin – Madison, Department of Electrical and Computer Engineering);
Funder: National Science Foundation (USA), Cyberlearning, #1623605;
Amount: **$549,392.**
Description: This project investigated ways of using machine learning to assess students' perceptual knowledge about visual representations that are commonly used in chemistry instruction and to model the acquisition of perceptual knowledge over time.

2016 - 2019 Principal Investigator on: *Supporting chemistry learning with adaptive support for connection making between graphical representations in a cognitive tutoring system*, together with Co-Investigator Judith Burstyn (University of Wisconsin – Madison, Department of Chemistry);
Funder: National Science Foundation (USA), Improving Undergraduate STEM Education (IUSE), #1611782;
Amount: **$599,829.**
Description: This project developed technology-based supports for representational competencies for chemistry instruction and tested whether these supports enhance students' learning of chemistry concepts.

2015 - 2020 Co-Investigator on: *LUCID: A project-focused cross-disciplinary graduate training program for data-enabled research in human and machine learning and teaching,* together with Principal Investigator Tim Rogers (University of Wisconsin – Madison, Department of Psychology) and Co-Investigators

Martha Alibali (University of Wisconsin – Madison, Department of Psychology), Rob Nowak (University of Wisconsin – Madison, Department of Electrical and Computer Engineering), Jerry Zhu (University of Wisconsin – Madison, Department of Computer Sciences);
Funder: National Science Foundation (USA) / NSF Research Traineeship (NRT) Data-Enabled Science and Engineering, #1545481;
Amount: **$2,999,737.**
Description: This project trained graduate students from computer science, engineering, cognitive psychology, and education sciences, with the goal of promoting a common knowledge base that allows these students to work productively across traditional boundaries on both basic research questions and practical, real-world problems.

2016 - 2017 Principal Investigator on: *Adaptive support for connection making among multiple visual representations in chemistry*;
Funder: Wisconsin Alumni Research Fund (WARF), University of Wisconsin – Madison (USA);
Amount: **$45,227.**
Description: This project investigated the purposes and ways in which chemistry students and teachers use visual representations and which difficulties arise in the context of learning and teaching with visual representations.

2015 - 2016 Co-Investigator on: *Active learning*, together with Principal Investigator John Moore (University of Wisconsin – Madison, Department of Chemistry);
Funder: Innovation Grant Funding System, University of Wisconsin – Madison (USA);
Amount: **$7,060.**
Description: This project developed an active learning intervention for an introductory undergraduate chemistry course and evaluated the intervention by comparing it to a traditional learning intervention.

2015 - 2016 Principal Investigator on: *Intelligently combining physical and virtual representations in educational technologies*;
Funder: Wisconsin Center for Education Research (WCER) Faculty Research Support Award, University of Wisconsin – Madison (USA);
Amount: **$6000.**
Description: This project investigated which characteristics of a learning activity and of students' prior knowledge determine how they interact with tangible and virtual representations in the context of chemistry learning.

2015 - 2016 Principal Investigator on: *Intelligent representations: How to integrate physical and virtual representations by adapting to the individual student's needs in real time*;
Funder: Wisconsin Alumni Research Fund (WARF), University of Wisconsin – Madison (USA);
Amount: **$42,073.**
Description: This project investigated how different sequences of tangible and virtual representations affect students' learning of chemistry concepts.

2014 - 2015 Principal Investigator on: *Learning with multiple, interactive graphical representations in organic chemistry*;

Funder: Wisconsin Alumni Research Fund (WARF), University of Wisconsin – Madison (USA);
Amount: **$53,642.**
Description: This project investigated representational competencies involved in students' learning with visual representations in chemistry.

2014 - 2015 Principal Investigator on: *CAP: Student Travel Support for the 7th International Conference on Educational Data Mining*;
Funder: National Science Foundation (USA), Cyberlearning, #1445401;
Amount: **$20,000.**
Description: This project funded participants in the Educational Data Mining Young Researcher Track, which helps young researchers broaden their perspectives on educational data and how to mine and analyze it for assessment purposes and to learn more about how people learn.

TEACHING

Courses

Since 2024 *Visualisierungen lernwirksam einsetzen*, taught annually at ETH Zurich, Switzerland

Since 2024 *Die Gestaltung schulischer Lernumgebungen*, taught annually at ETH Zurich, Switzerland

Since 2023 *Lehren und Lernen mit Technologien*, taught annually at ETH Zurich, Switzerland

2023 *Educational Approaches to Misinformation* at UW-Madison, USA

2022 *Contemporary Issues in Educational Psychology: Research and Practice of Learning with Visual Representations in STEM* at UW-Madison, USA

2022 *Conversations and Visualizations in Learning Analytics* at UW-Madison, USA

2021 *Learning Analytics Theory and Practice* at UW-Madison, USA

2014 - 2023 *Introduction to Learning Sciences II*, taught annually at UW-Madison, USA

2013 - 2022 *Introduction to Learning Sciences I*, taught annually at UW-Madison, USA

2016 - 2019 *Major Area Paper - A Course on Academic Writing*, taught annually at UW-Madison, USA

2018 *Intermediate Topics in Chemistry: Visual Representations of Foundational Concepts in General Chemistry* at UW-Madison, USA

2016 *Human-Computer Interactions* at UW-Madison, USA

2015 *Eye-tracking Research* at UW-Madison, USA

2015 *Educational Data Mining and Learning Analytics* at UW-Madison, USA

2014 *Design of Intelligent Tutoring Systems* at UW-Madison, USA

2012 *Applications of the Classical Learning Theories* at the Ruhr-Universität Bochum, Germany

2012 *Computer-Supported Collaboration* at the Ruhr-Universität Bochum, Germany

2012 *Teaching and Learning with Multimedia* at the IRuhr-Universität Bochum,

Germany

2011 *How to Create Computer-Based Learning Materials: Principles and Practices* at the at UW-MadisonRuhr-Universität Bochum, Germany

Workshops, Seminars, & Lectures

Rau, M. A. (2024) *How to Use Visual Representations Effectively – With and Without the Help of Educational Technologies.* Keynote at the EARLI SIG 6/7 Meeting, Tübingen, Germany, August 2024.

Rau, M. A. (2024) *The "Knowledge, Learning, and Instruction" Framework in My Research on Visualizations.* Invited talk at the International Symposium on Integration of Discovery and Instruction, St. Peter, Germany, July 2024.

Rau, M. A. (2024) *Visualizations can mislead because they're so intuitive. How can education help?* Inaugural lecture at ETH Zurich, Zurich, Switzerland, May 2024.

Rau, M. A. (2024) *Using Machine Learning to Improve Educational Interventions*. Keynote at the GymInf Conference, Fribourg, Switzerland, May 2024.

Rau, M. A. (2024) *Einsatz neuer Lehr- und Lerntechnologien im gymnasialen Unterricht.* Presentation at the Rotary Club am Greifensee, Maur, Switzerland, April 2024.

Rau, M. A. (2024) *Die Rolle der Lehr- und Lernforschung für die chemiedidaktische Ausbildung von Lehrer*innen.* Keynote at the Erhard Hayer Symposium, Vienna, Austria, March 2024.

Rau, M. A. (2024) *Von Chemie bis Fake News: Repräsentationskompetenzen zu fördern lohnt sich!* Keynote at the Biannual Meeting of the Teacher Education Program at ETH Zurich, Emmetten, Swizerland, February 2024.

Rau, M. A. (2024) *Lehr- und Lerntechnologien: Was können sie, was (noch) nicht, und wie kann man sie strategisch einsetzen.* Presentation at the Annual Hochschulen-Tag der Mittelschulen, Zurich, Switzerland, January 2024.

Rau, M. A. (2023) *Cognitive Tutor Authoring Tools in Action: A Few Examples.* Lecture at the 1st Annual Summer School on Intelligent Tutoring Systems, Zurich, Switzerland, August 2023.

Rau, M. A. (2023) *Learning with Visual Representations in Signal Processing Courses.* Presentation at the Festschrift for Barry Van Veen, Madison, WI, June 2023.

Rau, M. A. (2023) *Improving Educational Interventions With the Help of Machine Learning and Why We Need a Human in the Loop.* Presentation at the Colloquium of the Leibniz-Institut für die Pädagogik der Naturwissenschaften und Mathematik, Kiel, Germany, April 2023.

Rau, M. A. (2023) *Using Machine Learning to Improve Educational Interventions.* Lecture for the Wisconsin Center of Educational Research Lunch and Learn, Madison, WI, February 2023.

Rau, M. A. (2023) *Using Machine Learning to Improve Instruction: An Unembellished Story of Failures and Successes.* Keynote address at the 2023 Winter School of the ETH Zurich - EPFL Joint Doctoral Program in the Learning Sciences, Emmetten, Switzerland, February 2023.

Rau, M. A. (2022) *Using Support for Representational Competencies to Enhance STEM Learning Outcomes.* Lecture for the lecture series at the Leibniz-Institut für Wissensmedien, Tübingen, Germany, November 2022.

Rau, M. A. (2022) *Visual representations in MINT education: Pitfalls, benefits, and how to help students make the most out of visualizations.* Keynote address at the 2022 Meeting of the German Society for Didactics of Chemistry and Physics (Gesellschaft für Didaktik der Chemie und Physik), Aachen, Germany, September 2022.

Rau, M. A. (2022). *Adaptive technology support for learning with interactive visualizations in STEM*. Workshop talk at the 2022 Meeting of the Cognitive Development Society, Madison, WI, April 2022.

Rau, M. A. (2022). *Combining physical and virtual manipulatives in STEM instruction*. Lecture for the Wisconsin Society of Science Teachers, Wausau, WI, April 2022.

Rau, M. A. & Luu, R. (2021). *The role of visual representations in learning, identity, and equity.* Workshop at the Professional Learning and Community Education, University of Wisconsin – Madison, October 2021.

Rau, M. A. (2021). *Eye-tracking data as diagnostic tool to assess learning, knowledge, and problem solving.* Lecture in Individual Learning and Problem Solving, Ruhr-Universität Bochum, Germany, June 2021.

Rau. M. A. (2021). *Adaptive technology support for learning with interactive visualizations in STEM.* Seminar for Education Data Science Undergraduate Fellowship at the University of California in Berkeley, March 2021.

Rau, M. A. & Zhu, X. (2021). *Digitally inoculating graph viewers against misleading bar charts*. Talk given at the Human, Animal, and Machine Learning: Experiment and Theory (HAMLET) Seminar, University of Wisconsin – Madison, March 2021.

Rau, M. A. (2020). *Individual and collaborative learning of representational competencies in college chemistry.* Seminar talk in the Educational Psychology Institute at the Ruhr-Universität Bochum, Germany, January 2020.

Rau, M. A. (2019). *Using machine learning to overcome the expert blind spot for perceptual fluency trainings.* Lecture for the LUCID graduate training program for data-enabled research in human and machine learning and teaching, University of Wisconsin – Madison, August 2019.

Rau, M. A. (2019). *Teasing apart conceptual and embodied mechanisms of learning chemistry concepts with virtual and physical representations*. Lecture in the Interdisciplinary Training Program Seminar, University of Wisconsin – Madison, March 2019.

Rau, M. A. (2019). *Teasing apart conceptual and embodied mechanisms of learning chemistry concepts with virtual and physical representations.* Seminar talk in the Educational Psychology Institute at the Ruhr-Universität Bochum, Germany, March 2019.

Rau, M. A. (2019). *Publishing international research: From idea to paper(s)*. Seminar in the School of Education International Publication Workshop, University of Wisconsin – Madison, March 2019.

Rau, M. A. (2018). *Log data of intelligent tutoring systems.* Lecture in Individual Learning and Problem Solving, Ruhr-Universität Bochum, Germany, June 2018.

Rau, M. A. (2018). *How to support students in building intuitions about visual representations in chemistry?* Seminar talk at the Learning Sciences Research Institute at the University of Illinois at Chicago, February 2018.

Rau, M. A. (2017). *Vlogging about your research.* Seminar for the LUCID graduate training program for data-enabled research in human and machine learning and teaching, University

of Wisconsin – Madison, October 2017.

Rau, M. A., Zahn, M., & Schuster, H. (2017). *Learning with representations in educational technologies*. Lecture at the Fall 2017 Board of Visitors Meeting, University of Wisconsin – Madison, September 2017.

Rau, M. A. (2017). *The use of educational data mining to investigate students' learning with visual representations.* Seminar talk at Harvard, Cambridge, MA, June 2017.

Rau, M. A. (2017). *Using educational technologies to help students acquire representational competencies: Research on math and chemistry learning.* Seminar talk at the University of California in Berkeley, March 2017.

Rau, M. A. (2017). *How can adaptive educational technologies help students learn with visual representations?* Seminar talk at Stanford University, CA, March 2017.

Moore, J., Rau, M. A., Kennedy, K., Oxtoby, L. (2016). *Flip your general chemistry classroom the easy way.* Webinar for Cengage Learning, November 2016.

Rau, M. A. (2016). *How to support learning with visual representations: Research on elementary-school fractions and undergraduate chemistry learning*. Seminar talk at the Human, Animal, and Machine Learning: Experiment and Theory (HAMLET) Seminar, University of Wisconsin – Madison, November 2016.

Rau, M.A. (2016). *Conceptual and perceptual competencies in learning with visual representations: Lessons learned from research on elementary-school fractions and undergraduate chemistry learning.* Seminar talk at the Program of Interdisciplinary Educational Research at Carnegie Mellon University, Pittsburgh, PA, October 2016.

Rau, M.A. (2016). *Q&A – Things I wish I had known before becoming an assistant professor.* Graduate student seminar at Carnegie Mellon University, Pittsburgh, PA, October 2016.

Shipley, T., Uttal, D., Rau, M. A. (2016). *Research at the interface of discipline-based educational research and cognitive science.* Workshop at the Earth Educators Rendezvous, Madison, WI, July 2016.

Rau, M. A. & Moore, J. (2016). *Evaluating an active learning intervention in Chem 109*. Seminar talk at the Department of Chemistry Teacher's Meeting, University of Wisconsin – Madison, February 2016.

Rau, M. A. (2016). *Learning with visual representations: An intelligent tutoring system for chemistry*. Seminar for the Learning Understanding Cognition Intelligence and Data Science Graduate Training Program, University of Wisconsin – Madison, January 2016.

Rau, M. A., Zhu, X., Sen, A., Nowak, R., & Mason, B. (2015). *Modeling perceptional fluency with visual representations in an intelligent tutoring system for undergraduate chemistry*. Seminar talk at the Human, Animal, and Machine Learning: Experiment and Theory (HAMLET) Seminar, University of Wisconsin – Madison.

Rau, M. A. (2015). *Translational research in educational psychology.* Lecture in Education Policy Across the Disciplines for the Interdisciplinary Training Seminar in Education Sciences, University of Wisconsin – Madison, September 2015.

Rau, M. A. (2014). *Multimedia learning principles.* Workshop at Thomas Jefferson Middle School, Madison, WI, January 2014.

Rau, M. A. (2014). *Educational technologies.* Lecture in Human-Computer Interactions at the Computer Sciences Department, University of Wisconsin – Madison, November 2014.

Hubbard, E., Matthews, P., & Rau, M. A. (2014). *Leveraging the rational brain to promote fractions competence*. Lecture at the Wisconsin Center for Education Research 50th anniversary meeting, October 2014.

Rau, M. A. (2014). *Searching for mediation models in intelligent tutoring systems data: Representational understanding enhances representational fluency - but not vice versa.* Lecture in Models of Education Research for the Doctoral Research Program, University of Wisconsin – Madison, March 12, 2014.

Rau, M. A. & Scheines, R. (2013). *Causal model search in educational research.* Workshop on Case Studies of Causal Discovery with Model Search at Carnegie Mellon University, Pittsburgh, PA, October 2013.

CONTRIBUTIONS TO SCIENTIFIC COMMUNITY

Professional Activities

Member of School Commissions

Kantonsschule Stadelhofen, Zürich (since 2024)

Member of Editorial Boards

Learning and Individual Differences (since 2022)
Journal of Educational Psychology (since 2022)
International Journal of Artificial Intelligence in Education (since 2020)
Unterrichtswissenschaft (German Journal on Instructional Science) (since 2019)

Member of Program Committees

Artificial Intelligence in Education
Educational Data Mining (Senior member)
EATEL Summer School on Technology Enhanced Learning
International Conference on Artificial Intelligence in Education
International Conference on Educational Data Mining
ACM Conference on Intelligent User Interfaces

Society Memberships

International Artificial Intelligence in Education Society
International Educational Data Mining Society
International Society of the Learning Sciences, Co-chair of Communication Committee 2018-2023
American Educational Research Association
Organizing Committee of the 40th Annual Meeting of the Cognitive Science Society

Grant Review Activities

German National Science Foundation (Deutsche Forschungsgemeinschaft, DFG)
National Science Foundation
Institute of Education Research
Canada Foundation for Innovation

Peer-Review Activities for Journals and Books

Journal of Learning and Instruction
Journal of the Learning Sciences
International Journal of Artificial Intelligence in Education
International Journal of Science and Technology Education
International Journal of Technology-Enhanced Education

IEEE Transactions on Learning Technologies
Journal of Computers and Education
Chemistry Education Research and Practice
ZDM - Mathematics Education
Meetings of the Cognitive Science Society
International Conference on Artificial Intelligence in Education
International Conference on Educational Data Mining
International Conference on Intelligent Tutoring Systems
ACM Special Interest Group on Human-Computer Interaction
Routledge Taylor & Francis

Committees and Functions

University Committees

KITE Award Committee (2023-2024), ETH Zurich
Global Education Committee (2014-2019), UW-Madison
Education Graduate Research Scholars committee: 2015/16, 2016/17), UW-Madison
Faculty Senate: 2014/15 (alternate), 2015/16, 2016/17 (alternate), UW-Madison
Organizing committee of the Wisconsin Ideas in Education Series (2014-2016), UW-Madison

Departmental Committees

Strategy Commission (since 2024), ETH Zurich
Chair of the Learning Sciences Program (2022-2023), UW-Madison
Curriculum Committee (2022-2023), UW-Madison
Diversity Steering Committee (2022-2023), UW-Madison
Recruitment, Admissions, Fellowships, and Awards Committee (2014-2019, chair 2020-2022), UW-Madison
Faculty/Staff Honors Committee (2013-2014, 2016-2018), UW-Madison
Chair Election Committee (2017-2018), UW-Madison

PhD Student Advising

Nadia Al-Tabaa (UW-Madison, 2016)
Joel Beier (UW-Madison, 2019-2023)
Tiffany Herder (UW-Madison, 2018-2023)
Fatma Betül Güres (EPFL Lausanne, coadvisor with Tanja Käser)
Rosanne Luu (UW-Madison, 2021-2023)
Blake Mason (UW-Madison, 2016- 2020, coadvisor with Robert Nowak)
Claudia Matta (UW-Madison, 2019-2022)
Ipek Paksoy (ETH Zurich, since 2023)
Purav Patel (UW-Madison, 2017-2018)
Manuela Pineros-Rodriguez (EPFL Lausanne, coadvisor with Simone Deparis)
Jihyun Rho (UW-Madison, since 2020)
Ayon Sen (UW-Madison, 2016-2020, coadvisor with Jerry Zhu)
Hanall Sung (UW-Madison, 2019-2020)
Christopher Stahl (UW-Madison, 2019-2020)
Martina Vincoli (ETH Zurich, since 2024)
Sally Wu (UW-Madison, 2014-2019)

Member of Master Committees

Xuesong Cang (UW-Madison)

Catherine Dornfeld-Tissenbaum (UW-Madison)
Amanda Evenstone (UW-Madison)
Doy Kim (UW-Madison)
Yunji Park (UW-Madison)
Kelsey Schenck (UW-Madison)
Zachari Swiecki (UW-Madison)

Member of Qualifying and PhD Committees

Gol Arastoopour (UW-Madison, graduated 2017)
Milijana Buac (UW-Madison, graduated 2019)
Jaclyn Brown (UW-Madison, graduated 2014)
Catherine Dornfeld-Tissenbaum (UW-Madison, graduated 2018)
Brian Gibson (UW-Madison, graduated 2015)
Brendan Eagan (UW-Madison, graduated 2020)
Amanda Evenstone (UW-Madison, graduated 2020)
Laura Hobbes Legault (UW-Madison, graduated 2018)
Mojgan Hosseinzadeh (ETH Zurich)
Jordan Thevenow-Harrison (UW-Madison, graduated 2018)
Nicole Martin (UW-Madison, graduated 2019)
Claudia Matta (UW-Madison, graduated 2022)
Joe Michaelis (UW-Madison, graduated 2019)
Elizabeth Pier (UW-Madison, graduated 2017)
Lindsay Reiten (UW-Madison, graduated 2017)
Angela Samosorn (UW-Madison, graduated 2019)
Allison Sauppé (UW-Madison, graduated 2015)
Kelsey Schenck (UW-Madison graduated 2023)
Zachari Swiecki (UW-Madison, graduated 2020)
Fenella Symes (ETH Zurich)
Elizabeth Toomarian (UW-Madison, graduated 2019)
Eva-Maria Ternblad (Lund University, graduated 2024)
Nate Wheeler (UW-Madison, graduated 2022)