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### EDUCATION

- Ph.D. in Curriculum and Instruction** **Date of Completion: May 2019**  
University of Illinois at Urbana-Champaign  
Dissertation title: *Collaborative Problem Solving in Higher Education Classrooms: Exploring Students' Interactions, Group Progress, and the Role of the Teacher.*  
Advisor: Emma Mercier
- MA in Science Education** **June, 2012**  
American University of Beirut  
Thesis title: *Analysis of the Chemical Representations in Secondary Lebanese Chemistry Textbooks*  
Advisor: Saouma Boujaoude
- Teaching Diploma for Teaching Secondary Sciences** **June, 2006**  
American University of Beirut
- BA in Chemistry with a Minor in Business Administration** **June, 2005**  
American University of Beirut

### PUBLICATIONS

#### *Refereed Journal Articles*

- Israel, M., Chung, M., Wherfel, Q., **Shehab, S.**, Lash, T., & Resse, G. (in press). A descriptive analysis of engagement and collaboration of student with autism during elementary computer science instruction: A mixed methods study. *Computer Science Education*.
- Shehab, S.**, & Mercier, E. (2019). Implementing collaborative learning in classrooms: Science teachers' perspectives. *International Journal of Innovation in Education*, 5(4), 265-280
- Shehab, S. S.**, & BouJaoude, S. (2017). Analysis of the chemical representations in secondary Lebanese chemistry textbooks. *International Journal of Science and Mathematics Education*, 15(5), 797-816.

Israel, M., Wherfel, Q. M., **Shehab, S.**, Ramos, E. A., Metzger, A., & Reese, G. C. (2016). Assessing collaborative computing: development of the Collaborative-Computing Observation Instrument (C-COI). *Computer Science Education*, 26(2-3), 208-233.

Israel, M., Wherfel, Q. M., Pearson, J., **Shehab, S.**, & Tapia, T. (2015). Empowering K–12 students with disabilities to learn computational thinking and computer programming. *TEACHING Exceptional Children*, 48(1), 45-53.

Vlaardingerbroek, B., & **Shehab, S. S.** (2012). Educational assessment in Lebanon. *Assessment in Education: Principles, Policy & Practice*, 19(3), 379-386.

Vlaardingerbroek, B., **Shehab, S. S.**, & Alameh, S. K. (2011). The problem of open cheating and invigilator compliance in the Lebanese Brevet and Baccalaureat examinations. *International Journal of Educational Development*, 31(3), 297-302.

### **Conference Proceedings**

**Shehab, S.** & Mercier, M. (2020, June). Exploring the relationship between the types of interactions and progress on a task during collaborative problem solving. *In the Proceedings of the International Conference of the Learning Sciences*. Nashville, TN (Online).

Tucker, T., **Shehab, S.**, & Mercier, E (2020, June). Using the Gini Coefficient to characterize the distribution of group problem-solving processes in collaborative tasks. *In the Proceedings of the International Conference of the Learning Sciences*. Nashville, TN (Online).

**Shehab, S.** (2020, June). The impact of teachers' interventions on collaborative problem solving interactions in undergraduate engineering classrooms. *In the Proceedings of the American Society for Engineering Education Conference*. Montreal, Canada (Online).

Pagano, A., **Shehab, S.**, & Liebenberg, L. (2020, June). WIP: Introducing students to Human-Centered Design in a design for manufacturability course. *In the Proceedings of the American Society for Engineering Education Conference*. Montreal, Canada (Online).

Tucker, T. **Shehab, S.** & Mercier, E. (2020, June). The impact of scaffolding prompts on the collaborative problem solving of ill-structured tasks by undergraduate Engineering Student Groups. *In the Proceedings of the American Society for Engineering Education Conference*. Montreal, Canada (Online).

**Shehab, S.** & Mercier, E. (2019, June). Exploring teaching and course assistants' interventions with groups during collaborative problem solving. *In Proceedings of the 13<sup>th</sup> International Conference of Computer Supported Collaborative Learning (CSCL)*. Lyons, France.

- Tucker, T., **Shehab, S.**, Silva, M., Mercier, E. (2019, June). WIP: Evidence based analysis of the design of collaborative engineering tasks. In *Proceedings of the American Society for Engineering Education Conference*. Florida, USA.
- Shehab, S.** & Mercier, E. (2019, June). Visualizing representations of interaction states during CSCL. In *Proceeding of the International Conference of Computer Supported Collaborative Learning (CSCL)*. Lyons, France.
- Shehab, S.** & Mercier, E. (2018). Exploring teaching assistants' framing strategies of collaborative problem solving engineering tasks. In *Proceedings of the 3<sup>rd</sup> Learning Sciences Graduate Students Conference*. Nashville, TN.
- Paquette, L., Bosch, N., Mercier, E., Jung, J., **Shehab, S.**, & Tong, Y. (2018). Matching data-driven models of group interactions to video analysis of collaborative problem solving on tablet computers. In *Proceedings of the 13<sup>th</sup> International Conference of the Learning Sciences*. London: International Society of the Learning Sciences.
- Shehab, S.**, Mercier, E., Kersh, M., Juarez, G., & Zhao, H. (2017). Designing tasks for engineering problem solving. In *Proceedings of the 12th International Conference on Computer Supported Collaborative Learning*. Philadelphia, PA: International Society of the Learning Sciences.
- Shehab, S.**, & Mercier, E. (2017). The effect of the screen size of multi-touch tables on collaborative problem-solving interactions. In *Proceedings of the 12th International Conference on Computer Supported Collaborative Learning*. Philadelphia, PA: International Society of the Learning Sciences.
- Israel, M., **Shehab, S.**, Wherfel, Q. M., Melvin, O., & Lash, T. (2017). Describing Elementary Students' Interactions in K-5 Puzzle-based Computer Science Environments using the Collaborative Computing Observation Instrument (C-COI). In *Proceedings of the 2017 ACM Conference on International Computing Education Research*. ACM.
- Mercier, E., Fong, C., Cober, R., Slotta, J. d., Forssell, K. S., Israel, M., **Shehab, S.**, & Rummel, N. (2015). Researching and designing for the orchestration of learning in the CSCL classroom. In *Proceedings of the 11th International Conference on Computer Supported Collaborative Learning*. Gothenburg, Sweden: International Society of the Learning Sciences.
- Mercier, E., **Shehab, S.**, Sun, J., Capell, N. (2015). The development of collaborative practices in introductory engineering courses. In *Proceedings of the 11th International Conference on Computer Supported Collaborative Learning*. Gothenburg, Sweden: International Society of the Learning Sciences.
- Vlaardingerbroek, B., Rizk, N., & **Shehab, S.** (2012). The Brevet sciences and mathematics monitoring project: The early days. *Proceedings of the 12th Science and Mathematics Education Conference*. Beirut, Lebanon.

### ***Book Chapters***

Israel, M., **Shehab, S.**, & Wherfel, Q. (2018). Increasing science learning and engagement for academically diverse students through scaffolded scientific inquiry and universal design for learning. In M. Koomen, S. Khan, C. Atchison, & T. Wild (Eds.), *Towards inclusion of all learners through science teacher education* (pp.201-211). Boston: Brill.

### ***Papers Under Review***

**Shehab, S.** & Mercier, E. (under review). *Preparing Teaching Assistants to Implement Collaborative Problem Solving: The Development and Evaluation of a One-Semester Course.*

### ***Papers in Preparation***

**Shehab, S.**, Lawrence, L., & Tissenbaum, M. (in preparation). *Teaching Through Human-Centered Design in a Food Science Capstone Course: A Case Study.*

**Shehab, S.** (in preparation). *Chemistry by Design: Designing and Implementing a 4-Week High School Course to Teach Chemistry Through Human-Centered Design.*

**Shehab, S.** (in preparation). *Examining the Impact of Teachers' Interventions on the Quality of Collaborative Interactions and Group Progress During Collaborative Problem Solving.*

Lawrence, L., **Shehab, S.**, Tissenbaum, M. (in preparation). *Human-Centered Design Taxonomy: Case Study Application with Novice, Multidisciplinary Designers.*

O'Bryan, L., Bohn, D. & **Shehab, S.** (in preparation). *Integrating Human-Centered Design in a Semester-Long Food Science Capstone Course.*

Tucker, T., **Shehab, S.**, & Mercier, M. (in preparation). *Investigating the Impact of Ill-Structured Task Scaffolds on Students' Collaborative Problem-Solving Interactions and Quality of Final Solutions.*

### **CONFERENCE PRESENTATIONS**

**Shehab, S.**, Lawrence, L., Tissenbaum, M., Rui, T., & Hixon, T. (2021, June). *Integrating Human-Centered Design in higher education classrooms: Evaluating the first iteration.* Paper to be Presented at the American Education Research Association Virtual Conference.

Lawrence, L., **Shehab, S.**, Tissenbaum, M., Rui, T., & Hixon, T. (2021, June). *Human-Centered Design Taxonomy: Case study application with novice, multidisciplinary designers.* Poster to be Presented at the American Education Research Association Virtual Conference.

- Shehab, S.** & Bergandine, D. (2020, June). *Teaching chemistry through Human-Centered Design: Piloting an 8-week curriculum*. 2020 Biennial Conference on Chemical Education. Abstract accepted March 31, 2020. Because of the global COVID-19 pandemic, the 2020 Biennial Conference on Chemical Education was terminated on April 2, 2020, by the Executive Committee of the Division of Chemical Education, American Chemical Society; and, therefore, this presentation could not be given as intended.
- Shehab, S.** & Mercier, M. (2020, June). *Exploring the relationship between the types of interactions and progress on a task during collaborative problem solving*. The International Conference of the Learning Sciences, Nashville, TN (Online).
- Tucker, T., **Shehab, S.**, & Mercier, E (2020, June). *Using the Gini Coefficient to characterize the distribution of group problem-solving processes in collaborative tasks*. The International Conference of the Learning Sciences, Nashville, TN (Online).
- Shehab, S.** (2020, June). *The Impact of Teachers' Interventions on Collaborative Problem Solving Interactions in Undergraduate Engineering Classrooms*. Paper presented at the American Society for Engineering Education Conference, Montreal, Canada (Online).
- Pagano, A., **Shehab, S.**, & Liebenberg, L. (2020, June). *WIP: Introducing Students to Human-Centered Design in a Design for Manufacturability Course*. Paper presented at the American Society for Engineering Education Conference, Montreal, Canada (Online).
- Tucker, T. **Shehab, S.** & Mercier, E. (2020, June). *The Impact of Scaffolding Prompts on the Collaborative Problem Solving of Ill-Structured Tasks by Undergraduate Engineering Student Groups*. Paper presented at the American Society for Engineering Education Conference, Montreal, Canada (Online).
- Tucker, T., **Shehab, S. S.**, Mercier, E. M. & Silva, M. (2020, Apr 17 - 21). *Evidence-Based Analysis of the Design of Collaborative Engineering Tasks* [Roundtable Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/qoucdxd> (Conference Canceled)
- Lawrence, L., **Shehab, S. S.** & Mercier, E. M. (2020, Apr 17 - 21). *Examining the Use of a Supportive Orchestration Tool by Teaching Assistants During Collaborative Problem Solving* [Paper Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/vxcyhm3> (Conference Canceled).
- Mercier, E. M., Paquette, L., Bosch, N., Lawrence, L. & **Shehab, S.** (2020, Apr 17 - 21). *The Development and Implementation of an Orchestration Tool Based on Live Action Log Data* [Poster Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/sq3pgkw> (Conference Canceled).

- Shehab, S.**, Lawrence, L., Tissenbaum, M., Rui, T., & Hixon, T. (2020, May). *Integrating Human-Centered Design in higher education classrooms: Evaluating the first iteration*. The Sixteenth International Congress of Qualitative Inquiry (ICQI), Champaign, USA (Conference Canceled).
- Shehab, S.** & Bergandine, D. (2020, April). *Teaching chemistry through Human-centered design: Piloting an 8-week curriculum*. Biennial Conference on Chemical Education, Oregon, USA (Conference Canceled).
- Shehab, S.** & Mercier, E. (2019, June). *Exploring teaching and course assistants' interventions with groups during collaborative problem solving*. Paper presented at the conference of Computer Supported Collaborative Learning (CSCL), Lyons, France.
- Tucker, T., **Shehab, S.**, Silva, M., Mercier, E. (2019, June). *WIP: Evidence based analysis of the design of collaborative engineering tasks*. Poster presented at the American Society for Engineering Education Conference, Florida, USA.
- Shehab, S.** & Mercier, E. (2019, June). *Visualizing representations of interaction states during CSCL*. Poster presented at the conference of Computer Supported Collaborative Learning (CSCL), Lyons, France.
- Shehab, S.** & Mercier, E. (2019, April). *Exploring teaching and course assistants' interventions with groups during collaborative problem solving*. Poster presented at the American Educational Research Association, Toronto, Canada.
- Mercier, E., Kelly, S., **Shehab, S.**, & Jung, J., (2019, April). *Collaborative problem solving in engineering courses: Does technology influence quality of interactions?* Paper presented at the American Educational Research Association, Toronto, Canada.
- Shehab, S.** & Mercier, E. (2018, October). *Exploring teaching assistants' framing strategies of collaborative problem solving engineering tasks*. Paper presented at the Learning Science Graduate Student Conference, Nashville, TN.
- Mercier, E. & **Shehab, S.** (2018, April). *Adaptive expertise in the teaching of collaborative problem solving in undergraduate engineering courses*. Paper presented at the American Educational Research Association, New York, NY.
- Shehab, S.** & Mercier, E. (2017, June). *The effect of the screen size of multi-touch tables on collaborative problem-solving interactions*. Poster presented at the conference of Computer Supported Collaborative Learning (CSCL), Philadelphia, PA.
- Shehab, S.**, Mercier, E., Kersh, M., Juarez, G., & Zhao, H. (2017, June). *Designing tasks for engineering problem solving*. Poster presented at the conference of Computer Supported Collaborative Learning (CSCL), Philadelphia, PA.

- Israel, M., Chung, M., Wherfel, Q., **Shehab, S.**, Pokimica, J., Yeong, Gakyung, Y. & Lash, T. (2017, April). *Including students with disabilities in CS for all: Research findings and implications for practice*. Poster presented at the annual meeting of the American Educational Research Association, San Antonio, TX.
- Mercier, M., **Shehab, S.**, Kessler, M. & Fergeson, L. (2016, April). *The emergence of collaborative practices during a month of engineering problem solving activities*. Paper presented at the annual meeting of the American Educational Research Association, Washington, DC.
- Shehab, S.** & Mercier, E. (2015, April). *Collaborative learning in science: Teachers' perspectives*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.
- Shehab, S.** & Boujaoude, S. (2013, April). *The analysis of the chemical representations in secondary Lebanese chemistry textbooks*. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Puerto Rico.

## RESEARCH EXPERIENCE

### Postdoctoral Research Associate

*Siebel Center for Design, University of Illinois at Urbana-Champaign*

- Designing, Implementing, and Evaluating Support and Assessment Tools for Teaching With, About, and Through Human-Centered Design **Fall 2019 – Present**  
Rachel Switzky, Director

### Graduate Research Assistant

*Siebel Center for Design, University of Illinois at Urbana-Champaign*

- Designing Assessment Tools for Design Thinking, **Spring & Summer 2019**  
Rachel Switzky, Director

*College of Education, University of Illinois at Urbana-Champaign*

- Computer Supported Tools for Engineering Problems Solving (CSTEPS) **2013 – 2019**  
Emma Mercier, PI
- Teaching Computer Science for Elementary Students, Maya Israel, PI **2014 - 2016**

## TEACHING EXPERIENCE

*College of Education, University of Illinois at Urbana-Champaign*

- Instructor of CI541, *Learning in Science*, 8-Weeks Online Course **Fall 2019**
- Assistant for CI550, *Methods of Educational Inquiry*. Prof. Luc Paquette, lead instructor. **Fall 2018**
- Co-instructor for TAM 598, *Preparing Teaching Assistants for Implementing Collaborative Problem Solving*, with Prof. Emma Mercier. **2015 - 2016**
- Instructor for CI450, *Teaching Elementary Science I*. **2013 - 2014**
- Instructor for CI451, *Teaching Elementary Science II*.

*International College, Al-Byader School, Le Lycee National, Rawdah High School*      **2006 - 2013**

- Chemistry instructor for grades 7, 8, 9, 10, 11 (All Sections), and 12 (All Sections)
- Chemistry instructor for International Baccalaureate Standard and Higher Levels

## WORKSHOPS

**Shehab, S.** & Dietkus, R. (2020, November). *Pedagogy and assessment of human-centered design*. Virtual Workshop presented at the Illinois Extension Conference.

**Shehab, S.** (2020, February). *Introducing the human-centered design approach to school projects*. Workshop presented at the AGORA Days of the University Laboratory High School, Champaign, IL

**Shehab, S.**, Lawrence, L., O'Bryan, L., & Switzky, R. (2019, June). *Bringing the human-centered design approach to the K-12 classrooms*. Workshop presented at the Illinois New Teacher Collaborative summer conference, Champaign, IL

**Shehab, S.** (2018, June). *Designing tasks for collaborative problem solving*. Workshop presented at the Illinois New Teacher Collaborative summer conference, Champaign, IL

**Shehab, S.**, Lehr, T., & Israel, M. (2016, October). *Integrating computer programming into collaborative scientific argumentation*. Workshop presented at the Illinois Science Teachers' Association conference, Peoria, IL

Kessler, M., & **Shehab, S.** (2016, July). *Beyond divide and conquer: How to support productive group work*. Workshop presented at the Illinois New Teacher Collaborative summer conference, Champaign, IL

## AWARDS

- Graduate College Conference Travel Award      **Spring 2019**
- Russell & Janet Zwoyer Award for Outstanding Graduate Work      **November, 2017**
- Hardie Conference Travel Award      **Summer 2015, Spring 2019**
- The Fouad Saed Haddad Award for Distinguished Thesis in Education      **June, 2012**



## PROFESSIONAL MEMBERSHIPS

- Member of the organizing committee of the Learning Sciences Graduate Student Conference 2018
- International Society of the Learning Sciences, since 2015
- American Educational Research Association, since 2014
- National Association for Research in Science Teaching, since 2013

## PROFESSIONAL SERVICE

- Ad hoc reviewer for *Computers and Education*, since 2019
- Ad hoc reviewer for the *International Journal of Science and Mathematics Education*, since 2016
- Reviewer for the International Conference of the Learning Sciences, since 2019
- Reviewer for the American Society of Engineering Education conference, since 2018
- Reviewer for the American Educational Research Association conference, since 2018
- Reviewer for the Computer Supported Collaborative Learning conference, since 2016

## UNIVERSITY SERVICE

- Organized the American University of Beirut Annual Science Fair **2009 - 2012**
- Organized the American University of Beirut Graduation Ceremony **2004 - 2007**

## CONSULTING

- Writing chemistry laboratory activities for grades 10, 11, and 12 for a project that was supported by the Lebanese Ministry of Education through the American University of Beirut **2012 - 2013**

## REFERENCES

### **Emma Mercier**

Associate Professor of Education  
University of Illinois at Urbana-Champaign  
(217) 244-4320  
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### **Rachel Switzky**

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