

Chang Lu, Ph.D.

Personal Information

Associate Professor

School of Education, Shanghai Jiao Tong University

Chen Rui-Qiu Building, 245

800 Dongchuan Rd, Shanghai, China 200240

Contact: chang.lu@stju.edu.cn

Education

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|-----------------|--|
| 2017.9 – 2021.8 | Ph.D. in Measurement, Evaluation & Data Science, University of Alberta
Supervisors: Dr. Maria Cutumisu and Dr. Mark Gierl |
| 2014.9 – 2017.7 | M.A. in Applied Linguistics, Xian Jiao Tong University
Supervisor: Prof. Xiaomei Ma |
| 2010.9 – 2014.7 | B.A. in Foreign Language Studies, Xian Jiao Tong University |
| 2013.1 – 2013.7 | Exchange Program in Applied Linguistics, National Chengchi University |

Professional Experience

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| 2025.1 – Current | Associate Professor
Center for Education Big Data and Evaluation
School of Education
Shanghai Jiao Tong, Shanghai, China |
| 2021.9 – 2024.12 | Assistant Professor
Center for Education Big Data and Evaluation
School of Education
Shanghai Jiao Tong, Shanghai, China |
| 2017.9 – 2021.8 | Research Assistant
Centre for Research in Applied Measurement and Evaluation
University of Alberta, Edmonton, AB, Canada |
| 2019.9 – 2019.12 | Teaching Assistant
Department of Educational Psychology |

2019.1 – 2019.8 University of Alberta, Edmonton, AB, Canada
Statistical Research Consultant
Center for Research in Applied Measurement and Evaluation
University of Alberta, Edmonton, AB, Canada

Fundings

2026-2028. Intelligent Liberal Arts Project. 100,000 RMB.
2024-2027. Ministry of Education in China) Liberal Arts and Social Sciences Foundation Youth Project.
80,000 RMB.
2022-2025. Shanghai Pujiang Program. 150,000 RMB.
2022-2025. Shanghai Jiao Tong University Young Talent Cultivation Project. 10,000 RMB.
2021-2024. Shanghai Jiao Tong University Start-up Project. 100,000 RMB.
2020-2021. Alberta Innovates Graduate Student Scholarship: Data-Enabled Innovation (AIGSS-DEI).
\$31,000. Major. Provincial.

Awards

2025. WCU (World-Class University) Teaching and Mentoring Awards. 5000 RMB.
2021. Chinese Government Award for Outstanding Graduate Students Abroad. \$6,000. International.
2021. GSA Graduate Research Assistant Award, University of Alberta. \$500.
2021. Canadian Learning Sciences Graduate Student Engagement Award. \$100.
2017-2021. Graduate Student Assistantships. \$106,548.
2020. Alberta Excellence Graduate Scholarship (AEGS). University of Alberta. \$12,000. Provincial.
2020. GSA Graduate Research Assistant Awards, University of Alberta. \$500.
2020. Educational Psychology Travel Award, University of Alberta. \$100.
2019. Myer Horowitz Graduate Student Travel Fund, University of Alberta. \$500.
2019. CMASTE Graduate Student Travel Funds, University of Alberta. \$500.
2019. Graduate Student Association Travel Fund, University of Alberta. \$500.
2016. National Academic Graduate Scholarship, Chinese Ministry of Education. \$1,800.
2016. Outstanding Graduate Student Award, Xi'an Jiaotong University. Certificate.
2014. National Academic Graduate Scholarship, Chinese Ministry of Education. \$1,800.
2014. Outstanding Graduate Student Award, Xi'an Jiaotong University. Certificate.
2013. Outstanding Undergraduate Student Award, Xi'an Jiaotong University.
2013. National Endeavor Fellowship, Chinese Ministry of Education. \$1,000.
2013. Third Prize in the Internship Program Competition at Huanqiu.com. \$200.
2012. Outstanding Undergraduate Student Award, Xi'an Jiaotong University.

2012. Siyuan Scholarship, Xi'an Jiaotong University. \$200.

2011. Award for Outstanding Undergraduate Student, Xi'an Jiaotong University.

2011. Siyuan Scholarship, Xi'an Jiaotong University. \$200.

Publications (* refers to Correspondence)

- [1] Wang, C., **Lu, C.***, Chen, F., Liu, X., & Wang, Q. (2026). Assessing Computational Thinking Beyond Programming: A Scoping Review of Non-Programming-Based Computational Thinking Assessments for K-12 Education. *Journal of Computer Assisted Learning*, 42(1), e70191.
- [2] Wang, Q., Chen, F., Han, Y., Li, X., & **Lu, C.***. (2026). Mapping Student Engagement in Creative Thinking: An Explainable Machine Learning Approach to Behavioral Heterogeneity. *Thinking Skills and Creativity*, 102154.
- [3] **Lu, C.***, Bulut, O., Demmans Epp, C., & Gierl, M. (2025). Impacts of engagement on academic outcomes in technology-enhanced learning. *Distance Education*, 46(2), 318-337.
- [4] Chen, F., Liu, Y., Gao, Y., Cui, Y., Wang, Q., & **Lu, C.***. (2025). Does ICT matter for complex problem-solving competency? A multilevel analysis of 33 countries and economies. *Thinking Skills and Creativity*, 57, 101805.
- [5] Wang, Q., **Lu, C.***, Chen, F., Liu, X., & Zhao, Q. (2025). Exploring the complex interplay among middle schoolers' prior coding experience, computational thinking attitudes and skills: a multiple moderated mediation analysis. *Journal of Research on Technology in Education*, 1-18.
- [6] Li, X., Chen, F., & **Lu, C.** (2025). Internet Usage Inequality Among High School Students: Patterns, Motivational Predictors, and Educational Outcomes. *Computers & Education*, 105417.
- [7] Feng, S., **Lu, C.**, Shen, S., Ning, N., Wang, M., & Wang, S. (2025). Identifying students' cognitive-affective profiles and associations with gender and behaviors in virtual scientific inquiry: S. Feng et al. *Educational Technology Research and Development*, 1-25.
- [8] Wang, C., **Lu, C.***, Chen, F., Liu, X., Zhao, Q., & Wang, S. (2024). Growth mindset mediates the relationship between computational thinking and programming self-efficacy. *Education and Information Technologies*, 29(16), 21331-21354.
- [9] **Lu, C.***, & Bulut, O. (2024). Does higher endorsement with collaboration lead to better performance on collaborative problem solving? An explanatory item response approach to cross-cultural comparisons. *Frontiers in Psychology*, 15, 1468533.
- [10] Chen, F., **Lu, C.**, & Cui, Y. (2024). Using learners' problem-solving processes in computer-based assessments for enhanced learner modeling: A deep learning approach. *Education and Information Technologies*, 29(11), 13713-13733.

- [11] Wang, Q., Mousavi, A., Lu, C., & Gao, Y. (2023). Examining adults' behavioral patterns in a sequence of problem solving tasks in technology-rich environments. *Computers in Human Behavior*, 147, 107852.
- [12] Lu, C., & Cutumisu, M. (2022). Online engagement and performance on formative assessments mediate the relationship between attendance and course performance. *International Journal of Educational Technology in Higher Education*. 19:(2). <https://doi.org/10.1186/s41239-021-00307-5>.
- [13] Lu, C., MacDonald, R., Odell, O., Kokhan, V., Demmans Epp, C. & Cutumisu, M. (2022). A scoping review of computational thinking assessments in higher education. *Journal of Computing in Higher Education*. <https://doi.org/10.1007/s12528-021-09305-y>.
- [14] Cutumisu, M., Southcott, J., & Lu, C. (2022). Discovering Clusters of Support Utilization in the Canadian Community Health Survey–Mental Health. *International Journal of Mental Health and Addiction*, 1-23.
- [15] Chen, F., Lu, C., Cui, Y., Gao, Y (2022). Learning outcome modeling in computer-based assessments for learning: A sequential deep collaborative filtering approach. *IEEE Transactions on Learning Technologies*. TLT-2021-10-0261.
- [16] Qin W., Mousavi, A., Lu, C. (2022). A scoping review of empirical studies on theory-driven learning analytics. *Distance Education*. DOI: [10.1080/01587919.2021.2020621](https://doi.org/10.1080/01587919.2021.2020621).
- [17] Cutumisu, M., Southcott, J., & Lu, C. (2022). Discovering clusters in the responses to the Canadian community health survey: An unsupervised machine learning approach. *International Journal of Mental Health & Addiction*.
- [18] Chen, F., & Lu, C. (2022). Learner modeling in digital learning systems. In F. Ouyang, P. Jiao, B. M. McLaren, & A. H. Alavi (Eds.), *Artificial intelligence in STEM education: The paradigmatic shifts in research, education, and technology* (pp. pages of chapter). Auerbach/CRC Press.
- [19] Ma, X., Shi, X, Lu, C., & Li, R. (2022). Development and validation of a college English writing scale for classroom-based peer assessment. *Journal of Xi'an International Studies University*. CSSCI (In Chinese).
- [20] Das, J. P., & Lu, C. (2022). Speed of processing: Tests and factor structure. *Journal of Education and Practice*, 13(30), 30-11.
- [21] Cutumisu, M., Adams, C., Glanfield, F., Yuen, C., Lu, C. (2021). Using structural equation modeling to examine the relationship between pre-service teachers' computational thinking attitudes and skills. *IEEE Transactions on Education*.

- [22] **Lu, C.**, Ghoman, S. K., Cutumisu, M., & Schmölzer, G. M. (2021). Mindset moderates healthcare providers' longitudinal performance in a digital neonatal resuscitation simulator. *Frontiers in Pediatrics: Neonatology*. DOI: 10.3389/fped.2020.594690.
- [23] **Lu, C.**, & Cutumisu, M. (2021). Integrating deep learning into an automated feedback generation system for automated essay scoring. In *Proceedings of 14th International Conference on Educational Data Mining (EDM)*. Paris, France, June 29-July 2. Acceptance rate: 25%.
- [24] Shin, J., Chen, F., **Lu, C.**, & Bulut, O. (2021). Analyzing students' performance in computerized formative assessments to optimize teachers' test administration decisions using deep learning frameworks. *Journal of Computers in Education*, 1-21.
- [25] **Lu, C.**, Ghoman, S. K., Cutumisu, M., & Schmolzer, G. (2020). Unsupervised machine learning algorithms examine healthcare providers' perceptions and longitudinal performance in a digital neonatal resuscitation simulator. *Frontiers in Pediatrics*, 8, 544.
- [26] Cutumisu, M., Ghoman, S. K., **Lu, C.**, Patel, S. D., Garcia-Hidalgo, C., Fray, C., Brown, M. R. G., Greiner, R., & Schmölzer, G. M. (2020). Healthcare providers' performance, mindset, and attitudes towards a neonatal resuscitation computer-based simulator. *JMIR Serious Games*. DOI: 10.2196/21855.
- [27] Cutumisu, M., Adams, C., & **Lu, C.** (2019). A scoping review of empirical research on recent computational thinking assessments. *Journal of Science Education and Technology*, 28(6), 651-676.
- [28] Adams, C., Cutumisu, M., & **Lu, C.** (2019). Measuring K-12 computational thinking concepts, practices and perspectives: An examination of current CT assessments. Paper. In *Proceedings of the Society for Information Technology & Teacher Education (SITE)*, Las Vegas, NV, March 18-22. Acceptance rate: 25-39%.
- [29] **Lu, C.** (2016). A corpus-based investigation towards reading anxiety through TAP transcripts. *Foreign Language Education*. (1): 10-18. (In Chinese)

Refereed Published Paper Abstracts

- [1] **Lu, C.**, Ghoman, S. K., Cutumisu, M., & Schmölzer, G. M. (2020, November 4). Healthcare providers' perceptions and longitudinal performance in the RETAIN digital neonatal resuscitation simulator. Published Paper Abstract. *Women and Children's Health Research Institute (WCHRI) Research Day*. Edmonton, AB.
- [2] Southcott, J., **Lu, C.**, & Cutumisu, M. (2020, November 4). Detecting patterns of mental health support utilization by gender with machine learning. Published Paper Abstract. *Women and Children's Health Research Institute (WCHRI) Research Day*. Edmonton, AB.

Service

Journal Reviewer

Computers and Education
Review of Educational Research
International Journal of Educational Technology in Higher Education
British Journal of Educational Technology
Distance Education
Thinking Skills and Creativity
Journal of Computer Assisted Learning
Education and Information Technologies
Journal of Research on Technology in Education
The Asia-Pacific Education Researcher
Frontiers in Psychology
Humanities and Social Sciences Communications
Journal of Computers in Education
Cogent Education

Conference Reviewer

American Educational Research Association Annual Meeting, AERA
National Council of Measurement Evaluation Annual Meeting, NCME
Artificial Intelligence in Education, AIED

Refereed Presentations

International Conferences

- [1] **Lu, C.**, & Cutumisu, M. (2022). Better calibration of learner knowledge tracing using contextualized information. Poster. American Educational Research Association (AERA) Annual Meeting, San Diego, CA, April 22-25.
- [2] González-Esparza, L. M., Jin, H.-Y., **Lu, C.**, & Cutumisu, M. (2022). Performance comparison of tree-based algorithms for wheel-spinning behavior prediction. Paper. *American Educational Research Association (AERA) Annual Meeting*, San Diego, CA, April 22-25.
- [3] Jin, H.-Y., González-Esparza, L. M., **Lu, C.**, & Cutumisu, M. (2022). Identifying factors affecting PISA 2018 digital reading literacy via machine learning algorithms. Paper. *American Educational Research Association (AERA) Annual Meeting*, San Diego, CA, April 22-25.

- [4] **Lu, C.**, & Cutumisu, M. (2021). Engagement and formative assessment mediate the relation between attendance and academic performance. Paper. *19th Biennial EARLI Conference*. Gothenburg, Sweden, August 24-18.
- [5] **Lu, C.**, Ghoman, S. K., Schmölzer, G. M., & Cutumisu, M. (2021). Mindset moderates healthcare providers' performance in a neonatal resuscitation simulator. Paper. *19th Biennial EARLI Conference*. Gothenburg, Sweden, August 24-18.
- [6] **Lu, C.**, & Cutumisu, M. (2021). LSTM-MTSL: A deep learning approach to multivariate time-series log-event prediction of academic performance in a learning management system. Paper. *National Council on Measurement in Education Annual Meeting*. Baltimore, MD, June 8-11.
- [7] **Lu, C.**, Cutumisu, M., & Gierl, M. (2021). Towards automated essay scoring and feedback generation. Paper. *National Council on Measurement in Education Annual Meeting*. Baltimore, MD, June 8-11.
- [8] **Lu, C.**, Southcott, J., & Cutumisu, M. (2021). Comparing unsupervised machine learning algorithms to cluster the responses to the Canadian Community Health Survey. Roundtable Session. *American Educational Research Association (AERA) Annual Meeting*, Orlando, FL, April 9-12.
- [9] **Lu, C.**, Yuen, C., Glanfield, F., Cutumisu, M., Adams, C. (2021). Using structural equation modeling to examine the relationship between computational thinking attitudes and skills. Roundtable Session. *American Educational Research Association (AERA) Annual Meeting*, Orlando, FL, April 9-12.
- [10] Cutumisu, M., Ghoman, S. K., **Lu, C.**, Patel, S. D., Garcia-Hidalgo, C., Fray, C., Brown, M. R. G., Greiner, R., & Schmölzer, G. M. (2021). Neonatal resuscitators' performance, mindset, and attitudes towards a digital role-playing simulation game. Paper. *American Educational Research Association (AERA) Annual Meeting*, Orlando, FL, April 9-12.
- [11] Yuen, C., **Lu, C.**, Glanfield, F., Cutumisu, M., Adams, C. (2021). Validating educational assessments: The Callysto Computational Thinking test. Roundtable Session. *American Educational Research Association (AERA) Annual Meeting*, Orlando, FL, April 9-12.
- [12] Yuen, C., **Lu, C.**, Hackman, L., Samuel, M., Cutumisu, M., & Adams, C. (2021). Conducting large-scale computational thinking assessment research in K-12 schools. Roundtable Session. *American Educational Research Association (AERA) Annual Meeting*, Orlando, FL, April 9-12.
- [13] Adams, C., Cutumisu, M., Yuen, C., & **Lu, C.** (2020). Towards measuring pre-service teachers' computational thinking skills: Validating the Callysto Computational Thinking test (CCTt). Panel. *Society for Information Technology and Teacher Education (SITE) Conference*. April 6-10.

- [14] **Lu, C.**, Bulut, O., Epp, C., & Gierl, M. (2020). Identifying online learning behaviors using log data from learning management systems. Paper. *National Council on Measurement in Education Annual Meeting*, San Francisco, CA.
- [15] **Lu, C.** & Gierl, M. (2020). Automated essay scoring with multi-level representation deep learning models. Paper. *National Council on Measurement in Education Annual Meeting*, San Francisco, CA.
- [16] Shin, J., Chen, F., **Lu, C.** & Bulut, O. (2020). Automating test administration decisions in computerized formative assessment. Paper. *National Council on Measurement in Education Annual Meeting*, San Francisco, CA, USA.
- [17] **Lu, C.**, Cutumisu, M., & Adams, C. (2019). A scoping review of empirical research on recent computational thinking assessments. Poster. *American Educational Research Association (AERA) Annual Meeting*, Toronto, ON, Canada, April.
- [18] **Lu, C.**, & Bulut, O. (2019). Does valuing collaboration lead to greater success in collaborative problem solving? Paper. *National Council on Measurement in Education (NCME) Annual Meeting*, Toronto, ON, Canada, April.
- [19] **Lu, C.** (2016). Development and validation of an empirically-derived checklist for college English writing assessment: From cognitive diagnostic approach. Paper. *Pacific-Rim Objective Measurement Symposium*, Xian. August 1.
- [20] **Lu, C.** (2016). Investigation on the influence of Henan dialect on the phonetic learning of English consonants. Paper. *Pacific Second Language Research Forum*, Tokyo. September 7.
- [21] **Lu, C.** (2015). A comparative study between students' expectations and actual practice of Chinese bilingual education: A case study of Fluid Mechanics course in XJTU. Paper. *13th Asia TEFL International Conference*, Nanjing. November 5.

National Conferences

- [1] **Lu, C.**, & Cutumisu, M. (2021). Learner modeling for intelligent tutoring systems: A comparison of BKT and DKT. Paper. *Canadian Psychological Association 2021 National Convention*, Online, July 7-25.
- [2] **Lu, C.**, Ganguly, P., Sabharwal, P., Karimi Abdolmaleki, M., Southcott, J., Jin, H.-Y., González Esparza, L., & Cutumisu, M. (2021). A review of automated-feedback generation in Intelligent Tutoring Systems. Paper. *49th of the Canadian Society for the Study of Education (CSSE) Conference*. Edmonton, AB, May 29 - June 3.
- [3] Southcott, J., **Lu, C.**, Jin, H.-Y., González Esparza, L., & Cutumisu, M. (2021). Analyzing the reliability, validity, and model structure of mental health support utilization in the Canadian

Community Health Survey. Paper. *49th of the Canadian Society for the Study of Education (CSSE) Conference*. Edmonton, AB, May 29 - June 3.

- [4] Jin, H.-Y., **Lu, C.**, González Esparza, L., Southcott, J., & Cutumisu, M. (2021). Scoping literature review: Deeper learning and computational thinking. Paper. *49th of the Canadian Society for the Study of Education (CSSE) Conference*. Edmonton, AB, May 29 - June 3.
- [5] **Lu, C.**, MacDonald, R., Odell, B., Kokhan, V., Demmans Epp, C., & Cutumisu, M. (2020). Assessing computational thinking in higher education: A scoping review. Paper. *Canadian Society for the Study of Education (CSSE)*. London, ON, May 30 – June 4.
- [6] **Lu, C.** (2016). A survey on Chinese students' expectations and perceptions of content-based instruction in higher education. Paper. *The 7th Annual Meeting of Chinese Committee of Educational Linguistics*, Ningbo, China. April.

Local Conferences

- [1] **Lu, C.**, Yuen, C., Glanfield, F., Adams, C., & Cutumisu, M. (2021). Assessing pre-service teachers' data literacy self-efficacy with the Callysto Computational Thinking test (CCTt). Oral Paper Presentation. *SEGSA*. Edmonton, AB.
- [2] Yuen, C., Cutumisu, M., **Lu, C.**, & Adams, C. (2020). Exploring pre-service teachers' levels of data literacy and computational thinking with the CCT test (CCTt). Oral Paper Presentation. *SEGSA Conference*. March 14, Edmonton, AB. Cancelled due to COVID-19.
- [3] Yuen, C., **Lu, C.**, Cutumisu, M., Adams, C., Hackman, L., & Samuel, M. (2020). Designing a large-scale, in-school computational thinking study. Oral Paper Presentation. *Dunlop Graduate Conference*. March 13, Edmonton, AB.
- [4] **Lu, C.**, Yuen, C., Hackman, L., Samuel, M., Cutumisu, M., & Adams, C. (2019). A scoping review of empirical research on recent computational thinking assessments. Oral Paper Presentation. *CMASTE Seminar*. Edmonton, AB, December 11.
- [5] **Lu, C.**, Cutumisu, M., & Adams, C. (2019). Implementing a computational thinking survey for K-12 students. Oral Paper Presentation. *12th Annual G. M. Dunlop Educational Psychology Graduate Student Research Conference*, March 8, Edmonton, AB.
- [6] **Lu, C.** (2019). Machine learning approaches to math achievement prediction using PISA 2015 data. Oral Paper Presentation. *12th Annual G. M. Dunlop Educational Psychology Graduate Student Research Conference*, March 8, Edmonton, AB.

- [7] Yuen, C., **Lu, C.**, Hackman, L., Samuel, M., Cutumisu, M., & Adams, C. (2019). Planning for unexpected challenges in large-scale, in-school research studies. Oral Paper Presentation. *EEGSA/SEGSA Graduate Student Showcase*, Edmonton, AB, March 9th.
- [8] **Lu, C.**, Cutumisu, M., & Adams, C. (2018). Themes emerging from a literature review on computational thinking assessments. Oral Paper Presentation. *EEGSA/SEGSA Graduate Student Showcase*, March 10, Edmonton, AB.
- [9] **Lu, C.**, Cutumisu, M., & Adams, C. (2018). The state-of-the-art in computational thinking assessments: A literature review. Oral Paper Presentation. *11th Annual G. M. Dunlop Educational Psychology Graduate Student Research Conference*, March 8, Edmonton, AB.
- [10] Cutumisu, M., Adams, C., Yuen, C., Hackman, L., **Lu, C.**, Samuel, M., & Chu, B. (2019) Assessing computational thinking and data literacy: Designing the Callysto Computational Thinking Test (CCTt). Poster. *ENGAGE*. University of Alberta, Edmonton, AB, March 28.

Non-Refereed Scholarly Dissemination

Online Surveys and Software

- Cutumisu, M., Adams, C., Yuen, C., Hackman, L., **Lu, C.**, & Samuel, M. (2019). Callysto Computational Thinking Test (CCCT) Student Version. Available: <https://callysto.ca>
- Adams, C., Cutumisu, M., Yuen, C., Hackman, L., **Lu, C.**, & Samuel, M. (2019). Callysto Computational Thinking Test (CCCT) Teacher Version. Available: <https://callysto.ca>