MINKYUNG LEE

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SUMMARY

Dedicated Ph.D. candidate in Learning Design and Technologies with a strong foundation in data science, learning analytics, and instructional design. Proficient in leveraging advanced data analysis and research methods to enhance educational practices and outcomes. Adept at translating complex research findings into actionable insights for diverse stakeholders. Committed to the application of technology and data-driven decision-making to create effective and inclusive online learning environments. Seeking to contribute to the Open Learning Initiative at Carnegie Mellon University's Simon Initiative to advance the state of educational technology.

EDUCATION

Penn State University   State College, PA
Ph.D., Learning Design and Technologies   June 2024 (Expected)
Department of Learning and Performance Systems
Dissertation: "*Exploring the impact of role assignment in collaborative knowledge construction in asynchronous online discussions*"
Advisor: Roy Clariana, Priya Sharma

Lesley University   Cambridge, MA
M.Ed., Language and Literacy (Individually Designed)   Feb 2014
Department of Education
Thesis: "*Consideration in the improvement of Korean students' English proficiency and their perceptions to public English education*"
Advisor: William Stokes

Hanyang University   Seoul, KOREA
B.A., French Language and Culture   Aug 2009
Minor: English Language and Culture
Department of Liberal Arts

PROFESSIONAL APPOINTMENTS

Penn State University   State College, PA
Graduate Research Assistant, Leonhard Center for Engineering Education,
College of Engineering   June 2022 - Present
- Led quantitative data analysis for the study "Designing and Evaluating Virtual Reality Applications for a Machine Design Course," utilizing statistical techniques to assess the effectiveness of VR in educational settings.
- Led quantitative data analysis for the NSF-Boeing PEER Grant project "Engineering Online Learning in Advanced Manufacturing and Data Science," identifying student preferences and learning outcomes; a portion of this analysis contributed to the ASEE

conference paper "Student Preferences and Performance in Active Learning Online Environments."
- Implemented qualitative research methods, including interviews and focus groups, for NSF-funded REU and SLA projects, producing reports to guide enhancements in educational approaches and program development.

Penn State University   State College, PA
Graduate Research Fellow, Learning Design, World Campus   August 2018 – May 2022
- Utilized social network analysis to investigate the dynamics of collaborative learning, applying the Louvain algorithm to uncover emergent group patterns in asynchronous online discussions.
- Conducted comprehensive knowledge convergence studies through collaborative concept mapping, revealing insights into collective learning processes.
- Performed lexical network analysis on synchronous discussions, highlighting the application of natural language processing techniques to understand discourse patterns.
- Developed proficiency in R and Python for the analysis of educational data, enabling the execution of sophisticated statistical models and algorithms.
- Contributed to multiple presentations at national conferences, disseminating research findings on the use of social network analysis and learning analytics to advance understanding of online learning dynamics.

Seoul National University   Seoul, KOREA
Researcher, Global Education Center for Engineering, College of Engineering.   2017 - 2018
- Managed video conferencing technologies to support flipped classroom models, enhancing interactive learning and student engagement in engineering courses.
- Curated an engineering education outreach initiative, fostering interest in STEM among middle school students and illustrating a commitment to educational outreach and community service.
- Drafted comprehensive reports detailing the outcomes of technology(Arduino) - integrated educational programs for middle school students, providing evidence-based recommendations for future initiatives.

Hanyang University   Seoul, KOREA
Researcher, Center for Teaching and Learning, College of Education   2016-2017
- Organized and led monthly workshops focused on 4C Industrialization hosting expert speakers in the field and received an average satisfaction rating of 4.6/5.0.
- Played a role in the design and deployment of a Futurelearn course, successfully adapting it for a Korean MOOC platform, thereby enhancing its accessibility and impact.
- Engaged in comparative research of international flipped classroom practices, co-authoring a guidebook that captured essential techniques and recommended practices.
- Assessed the outcomes of project-based learning in semester-long student projects, applying pedagogical expertise to quantify educational progression and collaborative skill development.

FELLOWSHIPS & GRANTS

Penn State World Campus Graduate Research Fellowship	Fall 2018 - Spring 2022
Penn State World Campus Learning Design, Summer Research Fellowship	2019 - 2021
Penn State UPAC (University Park Allocation Committee), Graduate Student Travel Grant	2021, 2023

HONORS & AWARDS

Penn State College of Education Graduate Student Travel Award	2019, 2020, 2021, 2023
Summer Tuition Assistance Funding, Penn State University	2019, 2020, 2022, 2023

PUBLICATIONS

Lee, M.K., Susan Strauss, Priya Sharma (In preparation). Data-Driven Dynamics: Insights into Network Interactions and Outcomes in Student Discussions.

Lee, M.K., Clariana, R. (under review). Implementing Sociograms in Online Learning: Examining their influence on Community of Inquiry Elements, British Journal of Educational Technology (BJET).

Lee, M.K., Sharma, P. (under review). Applying a community detection algorithm to examine group formation in online discussions: Exploring Network Characteristics and Dynamics, Journal of Educational Computing Research.

Xia, Y., Cutler, S., Osunbunmi, I., Zappe, S. E., Gomez, E., Velegol, S., & **Lee, M.K.** (in press). The impact of applied improvisation on undergraduate engineering students' professional development. *Advances in Engineering Education*.

Lee, M.K. & Clariana, R. (2022). The influence of external concept structures on an individual's knowledge structures. Educational Technology, Research & Development (ETR&D)

Lee, M.K., Garbrick, A., Clariana, R. (2021). Knowledge convergence in collaborative concept mapping, Association for Educational Communications & Technology (AECT), Conference proceeding.

Jeong, J. & **Lee, M.K**. (2017). Hanyang MOOC Flipped Learning Guidebook, Hanyang University, Seoul.

PRESENTATIONS

Gregg, A., Cortes, D., Pauley, L., **Lee, M.K.,** Osunbunmi, I. Designing and Evaluating Virtual Reality Applications for a Machine Design Course, ASEE, Portland 2024.

Lee, M.K., Cutler, S., Osunbunmi, I., Zappe, S. E., Samuel, S. Student Preferences and Performance in Active Learning Online Environments, ASEE, Portland 2024.

Lee, M.K., Roy B. Clariana (2024, April). Implementing Sociograms in Online Learning: Examining their Influences on Community of Inquiry Elements, accepted as a poster, AERA, Philadelphia 2024.

Lee, M.K., Sharma, P. (2023, April). Applying community detection algorithms to examine group formation in online discussions, accepted as a presentation, AERA, Chicago 2023

Clariana, R., **Lee, M.K**. (2022. October). An OER Tool for Writing-to-Learn in Undergraduate Architectural Engineering, accepted as a presentation, College of Education Research Conference, State College

Lee, M.K., Sharma, P. (2022, October). Applying the Louvain algorithm to examine emergent groups in asynchronous online discussion, accepted as a presentation**,** College of Education Research Conference, State College

Lee, M.K., Garbrick, A., Clariana, R. (2021, November). Knowledge convergence in collaborative concept mapping, accepted as a presentation, Association for Educational Communications & Technology (AECT), Chicago.

Lee, M.K., Garbrick, A., Clariana, R. (2021, November). Lexical Network Analysis on synchronous Discussion, accepted as a poster, Association for Educational Communications & Technology (AECT), Chicago.

Lee, M.K., Clariana, R. (2021, November). Students' Perceptions in Online Courses with the Community of Inquiry Framework, accepted as a presentation, Association for Educational Communications & Technology (AECT), Chicago.

Lee, M.K., (2020, November). Social network analysis on online collaborative knowledge construction, accepted as a poster, Association for Educational Communications & Technology (AECT), Virtual.

Lee, M.K. Clariana, R. (2019, November). Knowledge structure measurement of cross-classification table as a visual external representation, accepted as a poster, Association for Educational Communications & Technology (AECT), Las Vegas.

Lee, M.K., & Jiyeon Lee. (2016, October). Examining affective variables within the EFL learner's interlanguage system, accepted as a presentation, KEFL (Korean Association of English as Foreign Language), Seoul.

RESEARCH EXPERIENCE IN FUNDED PROJECTS

Evaluation Assistant in NSF-REU Project
- **Project Title:** Integration of Biology and Materials in Chemical Engineering
  Principal Investigators: Stephanie Velegol, Esther Gomez
  Tasks: Conducted interviews for undergraduate participants and graduate mentors and analyzed data to produce a qualitative report to understand their experiences.

Research and Evaluation Assistant for Leonhard Center-funded Educational Innovation
- **Project Title:** A New Sustainable Lab Ambassador Program within the College of Engineering
  Principal Investigators: Rachel Brennan, Kristen Dreyer, Lydia Vandenburgh, David Jones
  Tasks: Conducted interviews for Sustainable Lab Ambassadors and focus groups for the lap PI and analyzed these qualitative data to produce a qualitative report to understand their sustainable lab experiences.

Research Consultant for NSF-Boeing PEER Grant
- **Project Title:** Engineering Online Learning in Advanced Manufacturing and Data Science
  Principal Investigator: Samuel Spiegel
  Tasks: Analyzed large-scale quantitative survey data and currently working on a manuscript.

RESEARCH SKILLS

Programming & Analysis Languages (Network Analysis, Statistical Analysis, Discourse Analysis)	Python, R
Statistical Analysis Tools	SPSS, Mplus
Content/Discourse Analysis Tools	NVivo
Visualization·& Network Analysis Tool	Gephi, yEd

TEACHIING & COURSE DESIGN EXPERIENCE

Penn State University   State College, PA
Teaching Assistant/ 'Seminar for Engineering Teaching Assistants',
College of Engineering   Fall 2023 - Present
- Graded and provided the feedback for the asynchronous discussion.
- Developed asynchronous collaborative discussion generated by Louvain algorithm.

Penn State University   State College, PA
Research-based Course Designer/ 'Introduction to Business
Information Systems', World Campus   Fall 2021, Spring 2022
- Designed two modules for enhancing asynchronous discussions in the *'Introduction to Business Information Systems'* course, which were formally accepted into the curriculum.

Seoul National University   Seoul
Teaching Assistant/ 'Global Engineering Technology Exchange',
College of Engineering   Fall 2017, Spring 2018
- Managed IP-based video conferencing for "flipped classroom" models and assisted collaboratively designed engineering MOOC classrooms with Tokyo university.

Hanyang University   Seoul
Course Design Assistant, '*Korea in a Global Context'*,

Center for Teaching and Learning   Fall 2016
- Assisted in refining MOOC (Futurelearn) course materials to align with pedagogical objectives, ensuring both quality and relevance.

Daejin Woman's High School   Seoul
English Instructor, Grade 11   Mar 2015- Feb 2016
- Prepared students for college entrance exams by emphasizing critical reading, writing, and comprehension skills.
- Implemented rigorous test-prep strategies, conducted mock tests, and provided personalized feedback to ensure students were well-equipped for the examination challenges.

Garak Middle School   Seoul
English Instructor, Grade 7-8   Mar 2009- Feb 2011
- Taught grammar, vocabulary expansion, and conversational fluency.
- Utilized multimedia resources and real-world contexts to make lessons relatable and to foster a genuine interest in the English language.

CERTIFICATES

University of California San Diego   2009

Teaching English to Speakers of Other Languages Program

ACADEMIC SERVICE

Peer Review for AECT	2019-2021
Peer Review for ASEE	2022,2024
Peer Review for AERA	2023,2024

OUTREACH

Korean Language and Culture Teacher (Grade 1-6), Korean School of New England	Newton, MA 2013-2015
ELL/ Bilingual Parent-Teacher conference assistant/interpreter, Department of Children and Families Malden, MA	Malden, MA 2014-2015

PROFESSIONAL AFFILIATIONS

American Educational Research Association (AERA)	2018, 2022, 2023
American Society for Engineering Education (ASEE)	2022, 2023
Association For Educational Communications & Technology (AECT)	2019 - 2022
The Korean Society of Educational Technology (KSET)	2017
The Korea Association of Foreign Languages Education (KAFLE)	2016