

ALEJANDRO ANDRADE

(Luis Alejandro Andrade Lotero)

laandrad@indiana.edu

www.alandra.org/laandrad

EDUCATION

Indiana University
School of Education
Bloomington, Indiana

August 2011 – Anticipated
graduation date: Spring 2018

- Doctoral candidate in Learning Sciences and Inquiry Methodology
- Advisors: Joshua Danish, PhD and Ginette Delandshere, PhD
- Doctoral Dissertation: Elicited Gestures: Understanding and Supporting Learning of Quantitative Patterns of Complex Systems with an Embodied Instructional Design

Pontificia Universidad Javeriana
School of Education
Bogotá, Colombia

August 2006 - March 2009

- Master of Science in Education
- Master's Thesis: Characterization of a mediation supported by external representations for developing the concept of fraction in 8-10-year-old children

Universidad de los Andes
School of Social Sciences
Bogotá, Colombia

August 1998 - March 2003

- Bachelor of Arts in Anthropology

RESEARCH

University of Colorado Boulder

Research Consultant

Fall 2016 - Spring 2017

Principal Investigator: Elena Diaz-Bilello, PhD

- Project advises the Denver Public School District in their implementation of student learning objectives for accountability purposes using learning progression within the elective areas in non-tested grades.
- Data collection, and qualitative and statistical analysis.

Indiana University

Graduate Assistant Researcher

Fall 2015 - Spring 2016

Principal Investigator: Joshua A. Danish, PhD

- Project examines elementary students' understanding of ecosystems using high-resolution multimodal learning analytic techniques
- Co-lead proposal writing, data collection and statistical analyses.

Research Consultant

Fall 2015 - Spring 2016

Principal Investigator: Cindy Hmelo-Silver, PhD

- Project is developing a metasyntesis of the field of Computer-Supported Collaborative Learning.
 - Statistical model specification, data analysis, and final report writing.
-

RESEARCH (continued)

Research Consultant

Summer 2015

Principal Investigator: Shannon Martin, PhD

- Project explored undergraduate legal system courses placement and where they fit in the curriculum for best learning outcomes.
- Statistical model specification (hierarchical linear model), data analysis, and final report writing.
- Report: (<http://citl.indiana.edu/files/pdf/slaf/Martin%20SLAF%20Completion%20Report%202015.pdf>)

Graduate Assistant Researcher

Fall 2011 - Spring 2012

Principal Investigator: Joshua A. Danish, PhD

- Project designed teacher and software scaffolds to promote student learning in the context of a museum intervention.
- Data collection and analysis, and contribution to written publications.

Universidad de San Buenaventura Bogotá, Colombia

Principal Investigator

2009 - 2011

- Project compared three instructional materials (physic-tangible, virtual-peripheral, virtual-tactile) as mediators of conceptual formation of every-day-life concepts in 6-year-old children.
- Project designer, coordinator, data analysis, and manuscript writing.

Fundación Alandra Difuciencia Bogotá, Colombia

Co-Principal Investigator

2005 - Present

- Project explored the design, development and validation of didactic materials for elementary and middle school mathematics education.
- Designer, data analysis, and manuscript writing.

Principal Investigator

2007 - 2009

- Project explored the design of an analogical clock as visual-tangible representations for mathematical concepts.
- Project designer, coordinator, data analysis, and manuscript writing.

Pontificia Universidad Javeriana Bogotá, Colombia

Graduate Researcher

2006 - 2008

Principal Investigator: Félix Gómez Hernández, M.S.

- Master's Thesis: Characterization of a mediation supported by external representations for developing the concept of fraction in 8-10-year-old children.

DifuCiencia- Fondo para la Acción Ambiental Bogotá, Colombia

Assistant Researcher

2002 - 2004

Principal Investigator: Amparo Lotero, M.S.

- Project explored the use of artisan hand-crafts at school as a meaningful framework of a new environmental consciousness in 5th grade children.
- Data collection and analysis.

PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES AND PROCEEDINGS

- Andrade, A.**, Danish, J. A. & Maltese, A.V. (accepted). A Measurement Model of Gestures in an Embodied Learning Environment: Accounting for Temporal Dependencies. *Journal of Learning Analytics*,
- Andrade, A.**, Georgen, C., & Stucker, M. (2017). Exploring a text-mining approach as rapid prototyping tool for formative assessments in inquiry-based online learning. In Smith, B.K., Borge, M., Lim, K.Y., & Mercier, E. (Eds.), *Making a Difference—Prioritizing Equity and Access in CSCL*. Proceedings of the Computer Supported Collaborative Learning Conference CSCL 2017, (Vol. pp. TBA). Philadelphia, PE USA: The International Society of the Learning Sciences. **(Best Student Paper Award Nominee)**
- Andrade, A.** (2017). Understanding student learning trajectories using multimodal learning analytics within an embodied-interaction learning environment. In Proceedings of the *Seventh International Learning Analytics & Knowledge Conference*, pp. 70-79. ACM, Vancouver, British Columbia, CA.
- Andrade, A.**, Lotero-Botero, A., & Andrade-Londoño, E. (2017). La hipótesis de los cuadros de significado en la solución de problemas matemáticos [**The Frames of Meaning Hypothesis: Children’s Mathematical Problem-Solving Abilities**]. *Revista Latinoamericana de Investigación en Matemática Educativa*, 20(1), 1-32. DOI: 10.12802/relime.17.2012
- Andrade, A.**, Delandshere, G., & Danish, J. A. (2016). Using multimodal learning analytics to model student behavior: a systematic analysis of epistemological framing. *Journal of Learning Analytics*, 3(2), 265–289. <http://dx.doi.org/10.18608/jla.2016.32.14>
- Danish, J. A., Saleh, A., **Andrade, A.**, & Bryan, B. (2016). Observing complex systems thinking in the zone of proximal development. *Instructional Science*, 45(1), 5-24. <http://dx.doi.org/10.1007/s11251-016-9391-z>
- Andrade, A.**, & Santo, R. (2016). Advancing learning visualizations: Situated action networks as scalable representations of learning in social settings. In C. K. Looi, J. Polman, U. Cress, & P. Reimann (Eds.), *Transforming Learning, Empowering Learners: The International Conference of the Learning Sciences (ICLS 2016)* (Vol. 1, pp. 434-441). Singapore: International Society of the Learning Sciences.
- Andrade, A.** (2015). Using situated-action networks to visualize complex learning. In Lindwall, O., Häkkinen, P., Koschman, T. Tchounikine, P. & Ludvigsen, S. (Eds.) *Exploring the material conditions of learning: Opportunities and challenges for CSCL*, Proceedings of the Computer Supported Collaborative Learning (CSCL) Conference, (Vol. 1, pp. 372 – 379). Gothenburg, Sweden: The International Society of the Learning Sciences.
- Danish, J. A., Enyedy, N., Saleh, A., Lee, C., **Andrade, A.** (2015). Science through technology enhanced play: Designing to support reflection through play and embodiment. In Lindwall, O., Häkkinen, P., Koschman, T. Tchounikine, P. & Ludvigsen, S. (Eds.) *Exploring the material conditions of learning: Opportunities and challenges for CSCL*, Proceedings of the Computer Supported Collaborative Learning (CSCL) Conference, (Vol. 1, pp. 332 – 339). Gothenburg, Sweden: The International Society of the Learning Sciences.
- Andrade-Lotero, L. A.** (2014). Si Galileo Galilei hubiera tenido una cámara digital: Enseñando ciencias a una generación digital [**If Galileo Galilei had had a digital camera: Teaching sciences to a digital generation**]. *Enseñanza de las Ciencias*, 32 (1), pp. 243-261. <http://dx.doi.org/10.5565/rev/ensciencias.998>

- Andrade, L. A.** & Danish, J. (2014). Advancing epistemological frame analysis to refine our understanding of inquiry frames in early elementary interviews. In J. Polman, E. Kyza, D.K. O’Neill, I. Tabak, W. R. Penuel, S. Jurow, K. O’Connor, T. Le, L. D’Amico (Eds.), *Proceedings of the International Conference of the Learning Sciences ICLS Workshop on Learning Analytics for Learning and Becoming in Practice (ICLS 2014)*, (Vol. 3, pp. 1637–1638). Boulder, CO: International Society of the Learning Sciences.
- Andrade, L. A.**, Danish, J., Moreno, Y., & Pérez, L. (2013). Measuring framing differences of single-mouse and tangible inputs on patterns of collaborative learning. In Rummel, N., Kapur, M., Nathan, M., & Puntambekar, S. (Eds.) *To see the world and a grain of sand: Learning across levels of space, time, and scale*, Proceedings of the Computer Supported Collaborative Learning (CSCL) Conference, (Vol.1, p. 34-41). Madison, Wisconsin: The International Society of the Learning Sciences.
- Andrade-Lotero, L. A.**, Espitia Gómez, C., Huertas Franco, E. A., Bacca Pachón, P. A., & Aldana Ahumada, D. R. (2012). Tocar o mirar: Comparación de procesos cognitivos en el aprendizaje con o sin manipulación física [**To look or to touch: Comparison of cognitive processes in learning with or without physical manipulation**]. *Psicología Educativa*, 18(1) 29-40.
<http://dx.doi.org/10.5093/ed2012a3>
- Andrade-Lotero, L. A.** (2012). Teoría de la carga cognitiva, diseño multimedia y aprendizaje: Un estado del arte [**Cognitive load theory, design and multimedia learning: A state of the art**]. *Magis, Revista Internacional de Investigación en Educación*, 5(10).
<http://revistas.javeriana.edu.co/index.php/MAGIS/article/view/4166/3169>
- Andrade, A.** (2011). The clock project: gears as visual-tangible representations for mathematical concepts. *International Journal of Technology and Design Education*, 21(1), 93-111. <http://dx.doi.org/10.1007/s10798-009-9104-x>
- Andrade-Lotero, L. A.**, Cobo-Charry, M. F., Díaz-Díaz, L. N., Flórez-Pineda, A. J., Garavito- Muñoz, C., González-Doblado, D. P., ... Villarraga-Acero, G. A. (2011). Manipulables físicos para la formación de conceptos artificiales en niños de 6 a 8 años de edad [**Adapting physical manipulatives for artificial concept generation in 6 to 8 years old children**]. *Itinerario Educativo* (57), 28, 157-183. http://www.usbbog.edu.co/Nuestra_Universidad/Publicaciones/Itinerario_educativo/_19.pdf
- Lotero Botero, L. A., Andrade Londoño, E. A., & **Andrade-Lotero, L. A.** (2011). La crisis de la multiplicación: Una propuesta para la estructuración conceptual [**The crisis of multiplication: A proposal of a conceptual structure**]. *Voces y Silencios*, 2 (Número Especial), 27, 38-64.
<http://dx.doi.org/10.1007/s10798-009-9104-x>
- Andrade-Lotero, L. A.** (2010). Algunos niños creen que la gallina tiene pelos: características representacionales de niños de 5o grado y su capacidad para establecer la procedencia de objetos de su vida cotidiana [**Some children think that hens have fur: Representational abilities in 5th grade children and their ability to understand the procedence of everyday objects**]. *Itinerario Educativo* (55), 159-180. http://www.usbbog.edu.co/Nuestra_Universidad/Publicaciones/Itinerario_educativo/Andrade55.pdf

BOOK CHAPTERS

- Andrade-Lotero, L. A.**, & Concha Ramírez, D. (2011). Aulas virtuales y educación a distancia: Una experiencia en la licenciatura de educación para la primera infancia [**Virtual classrooms and distance education: A case study at the B. A. Program in Early Childhood Education**] In: Rojas Cordero, W. & Cuevas Silva, J.M., (Eds.). *Humanidades en la era digital*. Bogotá: Editorial Bonaventuriana.

PEER-REVIEWED CONFERENCE PRESENTATIONS

- Andrade, A.**, Danish, J.A., & Maltese, A., (2017). Why are you gesturing? Elicited gestures and learning gains in an embodied learning environment. Paper presented at the *Annual Meeting of the American Educational Research Association*, San Antonio, TX, USA.
- Chen, L., **Andrade, A.**, Hanauer, M. (2017). *Applying Bayesian statistics for estimating intervention effects in single-case designs*. Paper presented at the Annual Meeting of the American Educational Research Association, San Antonio, TX, USA.
- Andrade, A.**, Saleh, A., Rehack, A.M., Gomoll, A.S., Danish, J. A., & Hmelo-Silver, C. (2016). Exploring a text-mining approach for the analysis of computer collaborative data from a design-based research project. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC, USA.
- Gomoll, A.S., Rehack, A.M., Novak, W.E., **Andrade, A.**, Saleh, A., Hmelo-Silver, C., & Danish, J. A. (2016), "It could be so many learning theories": Multimedia artifacts and professional vision in preservice teachers. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC, USA.
- Falkner, R.T, Hartley, K.A., Hmelo-Silver, C.E., Jeong, H., & **Andrade, A.** (2016), Computer-supported collaborative learning in STEM domains: An exploratory synthesis. Poster presented at the Annual Meeting of the American Educational Research Association, Washington, DC, USA.
- Andrade, A.**, Delandshere, G., & Danish, J. A. (2015). Using a multimodal learning analytic technique to find epistemological framing in early elementary interviews. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL, USA.
- Andrade, A.**, Delandshere, G., & Danish, J. (2014) Video-based analytics for epistemological frame analysis in semi-structured interviews. Paper presented at the International Conference of the Learning Sciences (ICLS), Boulder, Colorado.
- Danish, J. A., Peppler, K. A., Phelps, D., **Andrade-Lotero, L. A.**, & Whiting, J. (2014). The impact of disciplinary framing upon early elementary students' representational critiques. Paper presented at the Annual Meeting of the American Educational Research Association, Philadelphia, PA.
- Danish, J. A., Saleh, A., & **Andrade-Lotero, L. A.** (2014). Software scaffolds for supporting teacher-led inquiry into complex systems concepts. Paper presented at the Annual Meeting of the American Educational Research Association, Philadelphia, PA.
- Danish, J. A., Saleh, A., **Andrade-Lotero, L. A.**, & Bryan, B. (2014). Observing complex systems thinking in the zone of proximal development. Poster presented at the Annual Meeting of the American Educational Research Association, Philadelphia, PA.
- Danish, J., Saleh, A., **Andrade Lotero, L.A.** (2013). Designing interactive scaffolds to support teacher-led inquiry of complex systems concepts. Poster presented at the 10th International Conference on Computer Supported Collaborative Learning, Madison, June 15th, 2013.
- Lotero Botero, A., Andrade Londoño, E. & **Andrade Lotero, L.A.** (2012) Tangibles, construction of meaning and math problem solving. Paper presented at the 2nd International Conference: The Future of Education, Florence, Italy.
- Saleh, A., Danish, J., **Andrade Lotero, L.A.**, & Phelps, D. (2012) Examining how activity shapes students' interactions while creating representations in early elementary science. Paper presented at the Annual Meeting of the American Educational Research Association, Vancouver, Canada.

AWARDS & RECOGNITION

CyberLearning Data Consortium Fellowship

Spring 2016

- Fellowship awarded \$2000 support for a collaboration with a mentor to produce a short white paper detailing a new research question, method, or finding in creative learning analytics and play.
- Mentor Marcelo Worsely, PhD at Northwestern University.

School of Education Proffitt Research Award Indiana University

2015 - 2016

- Internal grant awarded to support faculty and graduate students for developing new research projects. Grant provided funding for tuition, stipend, and a small fund for materials up to \$19,000. I led the writing of this proposal which then became my dissertation project.

Counseling and Educational Psychology Student Research Award Indiana University

2015

- Department-wide recognition awarded to one student per year. This award recognizes outstanding student research and requires the publishing of a first-authored article in a peer-reviewed journal or international conference.

Graduate and Professional Student Organization Travel Award Indiana University

Fall 2013

- University-wide award to help support travel expenses of \$500 to conferences for students who participate in significant conferences and presented as first authors.

Malvina McNiell Graduate Program Enrichment Fund Travel Award Indiana University

2013 – 2016

- Three times recipient of this department wide award to help support travel expenses of \$300 to conferences.
-

TEACHING EXPERIENCE

Adjunct Professor University of Colorado - Boulder

Fall 2016

EDUC-5617 Basic Statistical Methods

- Instructor of one section of a mixed graduate-undergraduate course.
- Application of descriptive and inferential statistics concepts and introduction to basic analysis such as correlation, simple regression, t-test, and one-way ANOVA.
- Weekly instruction, design of curriculum, assignments, and assessments.

Associate Instructor Indiana University

Fall 2012 - Spring 2015

Y500 Computer Lab for Y502 Intermediate Statistics Applied to Education

- Instructor of record for eight sections of a graduate lab course over six semesters.
- Application of descriptive and inferential statistics concepts using SPSS and introduction to basic analysis such as correlation, simple regression, t-test, and one-way ANOVA.

- Twice weekly instruction, leading discussion, grading, and facilitating skill practice sessions through experiential exercises.

Y500 Computer Lab for Y603 Statistical Design of Educational Research

- Instructor of record for three sections of a graduate lab course over three years.
- Application of factorial ANOVA models using SAS for causal effect estimation.
- Twice weekly instruction, leading discussion, grading, and facilitating skill practice sessions through experiential exercise.

Y500 Computer Lab for Y604 Applied Multivariate Statistics

- Instructor of record for three sections of a graduate lab course over three years.
- Application of multivariate linear models including multiple regression and discriminant analysis, exploratory and confirmatory factor analysis, and an introduction to structural equation modeling concepts using SPSS, LISREL, and R.
- Twice weekly instruction, design assignments, leading discussion, grading, and facilitating skill practice sessions through experiential exercises.

Assistant Professor
Universidad de San Buenaventura
Bogotá, Colombia

Spring 2011

Designing Learning Environments

- Instructed one section of a graduate course geared toward students majoring in education.
- The course surveyed the principal learning theories and offered students the opportunity to explore some application examples in various scenarios.
- Weekly instruction, design of curriculum and assignments, and facilitating skill practice sessions through experiential exercises.

Assistant Professor
Universidad de San Buenaventura
Bogotá, Colombia

February 2009 - June 2011

Early Childhood Education Courses

- Instructed several undergraduate courses geared toward students majoring in Early Childhood Education.
- Courses instructed include Science Education, Mathematics Education, Educational Software, and Environmental Education.
- Twice weekly instruction, design of curriculum, assignments, leading discussion, and grading for a total of 16 sections.

Adjunct Professor
Universidad del Rosario
Bogotá, Colombia

August 2006 - December 2009

School of Human Sciences

- Instructed several undergraduate courses that surveyed some key anthropological issues.
- Courses instructed include Human Evolution; Myth, Language, and Science; Field Notes: Around Nigeria and the Black Africa.
- Weekly instruction, design of curriculum, assignments, leading discussion, and grading for a total of six sections.

LEADERSHIP & SERVICE

Journal of Learning Analytics 2015
Reviewer

- Manuscript review in the area of sociocultural theory and collaborative learning.

**Educational Psychology: An International Journal
of Experimental Educational Psychology** 2013
Reviewer

- Manuscript review in the context of cognitive load theory and learning environment design.

Selection Committee IST 2016 and 2015 Conferences January - March 2016
Indiana University January - March 2015
Committee Chair

- Coordination of reviewers.
- Screen for formatting manuscripts submitted to the conference.
- Develop rubrics and communication formats to score papers.
- Assign reviewers, tally results, and communicate with authors.

Learning Science Graduate Student Association January 2013 - December 2014
Indiana University
President

- Represent the Learning Sciences graduate student body to the university at large, serve as chair at all Executive Committee and LSGSA meetings.

Vice-President

- Coordinate social and community events for the LS student body as well as professional development events for the LS community.

Treasurer

- Record, keep, and maintain the funds belonging to the LSGSA and applied to university organizations for funds.

Hipact/Choice NGO Summer 2001
Ozoro, Delta State, Nigeria
Volunteer

- Teach basic computer skills to rural school grade teachers in the province of Ozoro.

PROFESSIONAL AFFILIATIONS

- **American Educational Research Association** December 2012 - Present
- **International Society of the Learning Sciences** December 2012 - Present
- **Society for Learning Analytics Research** December 2014 - Present

PROGRAMMING AND SOFTWARE EXPERIENCE

- **Quantitative:** R, PYTHON, SAS, SPSS, BILOG, LISREL
- **Qualitative:** Atlas.ti, ELAN, InqScribe