

CRISTIAN E. VARGAS-ORDÓÑEZ (he/él)

myStrengths: Empathy | Individualization | Connectedness | Strategic | Ideation

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EDUCATION

Purdue University, West Lafayette, IN

Ph.D., Engineering Education, August 2024

Advisor: Dr. Morgan Hynes

Dissertation: Integrating the arts in engineering education to challenge the engineering egosystem and promote peace

University of Los Andes, Bogotá, Colombia

M.A., Education, 2019

Thesis: Exploration of conceptions and attitudes of chemical engineers from Bogotá and Manizales about chemical engineering

National University of Quilmes, Bernal, Argentina

M.Sc., Science, Technology and Society, with honors, 2018

Thesis: Exploración de la percepción social de la ciencia y la tecnología de ingenieros químicos colombianos y sus docentes [Exploration of the social perception of science and technology of Colombian chemical engineers and their professors]

University of America, Bogotá, Colombia

B.Sc., Chemical Engineering, 2008

Thesis: Desarrollo de una propuesta para la ampliación y mejoramiento de los procesos productivos en la fábrica de pinturas Pintuflex Ltda. [Design of a proposal for the expansion and improvement of production processes in the paint company Pintuflex Ltda.]

RESEARCH EXPERIENCE

PUBLICATIONS

Vargas-Ordóñez, C., Baquero-Sierra, M. J. A., Robinson, M., & Tawney, J. R. (2024). Board 101:

Compassion and Engineering Ethics: Validation of the Compassionate Engagement and Action Scales for the Engineering Education Context. 2024 ASEE Conference.

Adams, S., **Vargas-Ordóñez, C.**, Hynes, M. M., Douglas, K. A., Bermel, P., Ely, D. R., & Grisez, H. J. (2024).

Evaluation of High School Semiconductor and Microelectronics Summer Program (Evaluation). 2024 ASEE Conference.

Rodríguez-Simmonds, H. E.*, Polettini Marcos, L.*, **Vargas-Ordóñez, C.***, & Kaufman-Ortiz, K. J.* (2024).

Ser marica es pa' machos [Ser bicha é pra macho]: Agency, activism, and coping when engineering. In L. Perez-Felkner, S. L. Rodriguez, & F. Ciera (Eds.), *Latinx Students in Engineering: An Intentional Focus on a Growing Population*. * Co-authors.

Vargas-Ordóñez, C., Santagata, M., & Yu, D. (2023). Assessing students' perspectives and attitudes towards social justice and compassion in civil engineering (Work in Progress). 2023 ASEE Conference.

Vargas-Ordóñez, C. & Hynes, M. (2023). Break a [cardboard] leg!: Collaborative design of an integrated arts & engineering activity (Resource Exchange).

- Baquero-Sierra, A., **Vargas-Ordóñez, C.**, McBride, S. & McDermott, J. (2023). Understanding international graduate engineering students' well-being: What do they need to thrive? (Work in Progress). 2023 ASEE Conference.
- Vargas-Ordóñez, C.***, Wei, S.*, & Li, T.* (2022). "At the Bottom of the Food Chain": Constructing Academic Identity in Engineering Education as International Graduate Students, ASEE Conference, Minneapolis. * Co-authors
- Vargas-Ordóñez, C.** & Hynes, M. (2022). Transdisciplinary STEAM education: Advocating for compassion as a core value in engineering, ASEE Conference, Minneapolis.
- Vargas-Ordóñez, C.** & Hynes, M. (2021). Integrating art and engineering: What do faculty perceive?, ASEE Conference, Long Beach.
- Vargas-Ordóñez, C.**, Gray, A, & Hynes, M. (2021). Olympics on the Moon: Resource exchange. ASEE Conference, Long Beach.
- Vargas-Ordóñez, C.** & Hynes, M. (2020). Engineering design and social justice: A systematized literature review, ASEE Conference, Montreal.
- Oñate-Parra L.*, Santos-Flórez, L.* & **Vargas-Ordóñez, C.*** (2019). Astronomía y apropiación de la cultura científica: Una apuesta del Planetario de Bogotá [Astronomy and appropriation of scientific culture: A bet from the Planetarium of Bogotá]. Bogotá: IDARTES, Alcaldía de Bogotá.
* Co-first authors
- Vargas-Ordóñez, C.** (2019). Exploración de la percepción social de la ciencia y la tecnología de ingenieros químicos colombianos y sus docentes [Exploration of the social perception of science and technology of Colombian chemical engineers and their professors], UIS Ingenierías, 18 (2), 51-66.
- Vargas-Ordóñez, C.** (2019). Las representaciones sociales como propuesta para el estudio de la percepción social de la ciencia y la tecnología: Un acercamiento conceptual y metodológico [Social representations as a proposal for the study of the social perception of science and technology: A conceptual and methodological approach], Divulgatio. Perfiles académicos de posgrado, 3 (8), 30-45.
- Vargas-Ordóñez, C.** & **Tafur-Arciniegas, M.** (2018). WIP: Exploration of Conceptions and Attitudes of Colombian and American Chemical Engineers about Chemical Engineering, ASEE Conference, Salt Lake City, UT.

WORKS IN PROGRESS

- Vargas-Ordóñez, C.**, Santagata, M., & Yu, D. (In Progress). Negotiating social justice in civil engineering education: insights and lessons from curriculum development. Expected to publish in the Journal of Civil Engineering Education.
- Vargas-Ordóñez, C.**, Baquero-Sierra, A., Tawney, J., Robinson, M., & Hynes, M. (In Progress). Compassion and engineering ethics: validation of the compassionate engagement and action scales for the engineering education context. Expected to publish in the Journal of Engineering Education.
- Vargas-Ordóñez, C.** & Hynes, M. (In Progress). Voices of compassion: A discourse analysis of the perceptions of the students from the course Compassionate Engineering. Expected to publish in the Journal of Engineering Education.

RESEARCH INTERESTS

- Integration of the arts and engineering for epistemic justice, compassion, and critical thinking.
- Practice-based research in engineering and engineering education.
- Reflective curriculum and instruction design in engineering education – Engineering teacher as researcher.
- Qualitative methods in engineering education.

GRANTS

CILMAR Seed Grant program 2021-2022
Research about How international graduate students socially constructs their academic paths in Engineering Education.

RESEARCH POSITIONS

Purdue University

READI program 2023-2024

Supervisor: Dr. Morgan Hynes

- Design, implementation, and assessment of a summer camp for pre-college students focused on the development of semiconductor capacities and positive attitudes to semiconductors careers.
- Motivation and recruitment of underrepresented students to pursue careers related to the semiconductor industry.
- Integration of the arts and engineering through behavioral archaeology to achieve the learning outcomes.

Lyles School of Civil Engineering 2022-2023

Supervisor: Dr. Marika Santagata

- Assessment of the needs and barriers to incorporating social justice concepts in the undergraduate and graduate curriculum in the School.
- Identification of priority areas for incorporating social justice skills in the civil engineering curriculum.
- Assemblage of a body of knowledge on pedagogical best practices and content with examples of civil engineering endeavors and their socio-economic consequences from a social justice perspective.
- Development of preliminary course module content for a pilot.

Collaborative autoethnography 2022-2023

Supervisors: Dr. Hector Rodriguez-Simmonds, Dr. Allison Godwin, and Dr. Ruth Streveler

Ser marica es pa' machos [Ser bicha é pra macho]: Agency, activism, and coping when engineering.

CILMAR Seed Grant program 2021-2022

Supervisors: Dr. Morgan Hynes and Dr. Matthew Ohland

Research about How international graduate students socially constructs their academic paths in Engineering Education.

CISLUNAR 2020

Supervisor: Dr. Morgan Hynes

- Design and implementation of an online curriculum based in the Olympics on the Moon and Biomimicry for underrepresented pre-college students, integrating the engineering design process, specially the problem framework process
- Supervision of an undergraduate engineering student who assisted in the design and delivery of the online program

First-Year Engineering

Demography, Preparation and Retention: Diagnostic of the first-year engineering program at Purdue University 2019

Supervisor: Dr. Isabel Jiménez

- Descriptive statistical analysis of first-year engineering program at Purdue University
- Indicators construction related to the annual performance of this program

- Reports elaboration

PRESENTATIONS AND WORKSHOPS

Society of Social Studies of Science Conference (4S), Honolulu, HI Workshop: Embracing disciplinary symbiosis: a shadow puppetry workshop for interdisciplinary learning	2023
Society of Hispanic Professional Engineers Conference, Salt Lake City, UT Negotiating social justice in civil engineering education: insights and lessons from curriculum development.	2023
Frontiers in Engineering (FIE) Conference, College Station, TX Workshop: Understanding international student's struggles using Funds of Identity theory with an intersectional lens.	2023
Universidad de América, Bogotá D.C., Colombia Seminar: What is Engineering Education?	2023
2023 ASEE Conference, Baltimore, MD Poster: Assessing students' perspectives and attitudes towards social justice and compassion in civil engineering. Resource exchange: Break a [cardboard] leg!: Collaborative design of an integrated arts & engineering activity. Presentation: Understanding international graduate engineering students' well-being: What do they need to thrive? Workshop: Assisting international graduate students to overcome barriers in life and work: Co-constructing a handbook for key stakeholders.	2023
2022 ASEE Conference, Minneapolis, MN Presentation: "At the Bottom of the Food Chain": Constructing Academic Identity in Engineering Education as International Graduate Students, Transdisciplinary STEAM education: Advocating for compassion as a core value in engineering.	2022
Universidad de la Sabana, Bogotá, Colombia Engineering education landscape	2022
2021 ASEE Conference, Online Presentation: Integrating art and engineering: What do faculty perceive? Resource exchange: Olympics on the Moon: Resource exchange.	2021
2020 ASEE Conference, Online Presentation: Engineering design and social justice: A systematized literature review, ASEE Conference, Montreal.	2020
Secretaría de Educación del Distrito, Bogotá, Colombia Early childhood Engineering education	2020
Universidad de Ingeniería y Tecnología (UTEC), Lima, Perú Panel: Inclusion of minoritized populations in the work environment	2020
VIII Chemical Engineers Coloquio UNAL, , Bogotá, Colombia	2017

"Exploración de la percepción social de la ciencia y la tecnología de ingenieros químicos colombianos y sus docentes [Exploration of the social perception of science and technology of Colombian chemical engineers and their professors]", presented at the in 2017, Bogotá, Colombia.

Colombian Congress of Chemical Engineering and Related Professions, Manizalez, Colombia 2017
"Exploración de la percepción social de la ciencia y la tecnología de ingenieros químicos colombianos y sus docentes [Exploration of the social perception of science and technology of Colombian chemical engineers and their professors]", presented at the, Manizales, Colombia.

TEACHING EXPERIENCE

Purdue University

FaceLab / PALS

Summer 2021, 2022, and 2023

Supervisor: Dr. Morgan Hynes

- Design and implementation of an online curriculum for underrepresented pre-college students related to the integration of theater and engineering through shadow puppetry.
- Research assistantship to understand pre-college reflection on design and engineering perception.
- Supervision of an undergraduate engineering student who assisted in the design and delivery of the program.

School of Engineering Education

Fall 2022

Faculty apprentice course ENE502-History and Philosophy of Engineering Education

Faculty apprentice course ENE503-Engineering Education Inquiry

- Support first-year Ph.D. in the courses content.
- Providing meaningful feedback to Ph.D. students papers.
- Design and teach specific classes.

Engineering Undergraduate Research Office (EURO)

2022

SURF program

Mentor and Graduate Assistant

- Academic support and mentorship to science and engineering undergraduate students
- Events coordination
- Assignments grading

School of Engineering Education

2021-2022

First-Year Engineering

Graduate Teacher Assistant

- Leading undergraduate students to peer mentor and grade first year engineering students
- Grading supervision
- Talking in front of large audiences

Honors College

Fall 2021

Instructor and curriculum designer course HONR399-Compassionate Engineering

- Design of the course, materials, and resources
- Delivering the lecture and grading the projects

Planetarium of Bogotá

2016-2019

Pedagogic coordination project "Centros de Interés" [Interest Centers]

- Design of a curricular framework for K-12 students for astronomy learning
- Design of learning assessment strategies of the social appropriation of knowledge

- In-field articulation between the pedagogical proposal with the reality of the educational communities
- Co-design of pedagogical and operational agreements with the schools and governmental educational institutions
- Supervision of design and implementation of in-classroom activities

Happyyoga Colombia 2016-2019
Hatha-Radja Yoga teacher

Maloka, Science and Technology Museum 2016
Instructor

- Design of professional development activities for technical careers instructors and students focused on innovation based on scientific knowledge
- Training of trainers on the CTI systems at rural areas of the country

Chemistry professional 2011

- Design of content and museography guides for the “Barrancabermeja’s Oil Museum”
- Design of science divulgation activities for interactive modules in the museum rooms
- Training of museum guiders about chemistry and engineering

John Dewey School 2008-2009
Chemistry and Biology Secondary Teacher

- Implementation of traditional learning methodologies for 6-12 students
- Coordination of cross activities related to the Institutional Educational Project

DESIGN EXPERIENCE

Great Culture to Innovate 2019
Freelancer

- Design of workshops and instructional resources to foster innovation thinking in companies

Avianca Airlines – University of Los Andes 2018
Consultant

- Design of a proposal to foster the timely information to the client related to the state of the flights
- Design of data collection strategies from the different actors involved in the communicational process

Cavalry School - Colombian National Army and University of Los Andes 2018
Consultant

- Design of a policy proposal (policy memo) related to the role of the army in the Colombian after the peace agreement and its relationship with the Colombian sovereignty

National Oilwell Varco, Bogotá, Colombia 2011-2014
Operations Engineer

- Design of chemical formulas for wastewater treatment
- Use and maintenance of equipments for solids control in drilling muds
- Prediction and prevention of future operational problems related
- Supervision of in-shore engineers and workers

Nutrianálisis Ltda., Bogotá, Colombia 2010-2011

Coordinator of the Physical Essays Laboratory

- Design and testing of laboratory procedures and instruments for physical analysis of toys, military uniforms, and cookware
- Design of uncertainty monitoring and control procedures for physicochemical laboratory analysis
- Use of laboratory instruments and interpretation of standards for the solution clients' needs
- Laboratory quality control
- Supervision of laboratory assistants

District Secretary of Environment of Bogotá

2009-2010

Noise Control Engineer

- Use of digital instruments and interpretation of environmental for identifying of noise contamination cases related to citizens' complaints

Orbe Colombia S.A.

2008

Production Plant Manager

- Logistics and operation coordination of the production area
- Management of technological instruments related to inventories
- Management of prevention and safe codes at the production area

PROFESSIONAL SERVICE

Purdue University

Society of Hispanic Professional Engineers (SHPE)

2023

Graduate students recruitment, SHPE Convention.

Contact Improv at Purdue

2021-2023

Club president.

Summer Undergraduate Research Fellowship (SURF) Symposium

2022

Judge.

Engineering Undergraduate Research Office (EURO)

2022

SURF program

Science and engineering undergraduate students mentor.

Engineering Education Graduate Student Association (ENEGSA)

2021-2022

- Graduate Students Association Committee Representative.
- Engineering Education graduate students mentor.

SURF Symposium

2020

Judge.

Engineering Education Graduate Student Association (ENEGSA)

2020-2021

Multiculturalism and English as Second Language (ESL) Chair

Engineering Education graduate students mentor

- Director and producer Podcast "We, the Aliens" about the experience of international students in Engineering Education about studying a Ph.D. in the U.S.
- Coordinator " First Virtual Engineering Education Research Panel: Chapter Colombia"
- Engineering Education graduate students mentor.

PROFESSIONAL AFFILIATIONS

Society of Social Studies of Science (4S) 2023
Member

Society of Hispanic Professional Engineers (SHPE) 2022-2024

National Arts Education Association (NAEA) 2022-2024
Member

American Society of Engineering Education (ASEE) 2018-Present
Member and Diversity, Equity, and Inclusion delegate of the Multidisciplinary Engineering Division

AWARDS AND GRANTS

Byron Fellowship for generative leaders 2023

SOGA - The Student Organization Grant Allocation funding 2022 and 2023
Contact Improvisation Club Gathering

Estus H. and Vashti L. Magoon Award for Excellence in Teaching 2022

PGSG Strategic Partnership Grant 2021
Audio for the Engineering Education Graduate Student Association for the production of the podcast
We, the Aliens

Explorer Fellowship – School of Engineering Education 2019

LANGUAGE SKILL

Spanish: Native
English: Proficient
French: Intermediate

REFERENCES

Dr. Morgan Hynes
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Purdue University
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(857) 205-7447

Dr. Robin Adams
Professor of Engineering Education
Purdue University
rsadams@purdue.edu
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Dr. Marika Santagata
Professor of Civil Engineering
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