

Jemal Bedane Halkiyo

Email: jhalkiyo@asu.edu | Phone: 480-434-4679

EDUCATION BACKGROUND

- 2020- 2025 (May, anticipated) **Ph.D. Engineering Education Systems and Design**
Ira A. Fulton Schools of Engineering, Arizona State University, Arizona
Dissertation title: Impacts of Culturally Relevant Pedagogy on International and Domestic Undergraduate Engineering US Students on Engineering Education Equity and Inclusivity
- 2016- 2018 **M.Sc. Road and Transport Engineering**
Department of Civil Engineering, Arba Minch Institute of Technology
Arba Minch University, Arba Minch, Ethiopia
Special Honor: Great Distinction Graduate
- 2011- 2015 **B.Sc. Civil Engineering**
Hawassa Institute of Technology
Hawassa University, Hawassa, Ethiopia

ACADEMIC CERTIFICATIONS

- 2021- 2022 **Certified with GC – CIRTL – Associate Level:** Center for the Integration of Research, Teaching, and Learning
Arizona State University, Graduate College
- 2021-2022 **Certified with ITA Teacher Training Course:** Instructor of a class and lead large discussion groups.
- 2011- 2018 **Engineering Software Completion Certificates**
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|-----------------------|-----------------------|
| ● AutoCAD | ● MiniTAB |
| ● ETABS | ● SIDRA Solution |
| ● HDM-4 | ● RED Model |
| ● STAAD.PRO V8i | ● SPSS |
| ● CADD and SolidWorks | ● KENPAVE |
| ● MX-ROAD | ● Basic Computer and |
| ● Statistica | Microsoft Application |

JOURNAL ARTICLES PUBLISHED OR IN PRESS (6)

1. **Halkiyo, J. B.,** Halkiyu, S. B., & Kellam, N (2024). Exploring how Ethiopian Women Students Perceive a Sense of Belonging in Engineering Higher Education. *Southern Journal of Engineering Education*, 3(1), 29- 61. [DOI: 10.15641/sjee.v3i1.1479](https://doi.org/10.15641/sjee.v3i1.1479)
2. **Halkiyo, J. B.,** & Halkiyu, S. B. (2025, Jan). Examining Public Transport Terminals Factors Influencing Urban Traffic Speed Using Multiple Linear Regression Analysis. Taylor & Francis: Cogent Engineering—Accepted.
3. **Halkiyo, J. B.,** Halkiyu, S. B., & Agandi, R., Dr. (2018). Study of Transmission Towers and Proper Selection in Terms of their Effectiveness, Behavior, Deflection, and Economic Evaluations. *International Journal of Scientific & Engineering Research*, 9(3), 1635-1644.
4. **Halkiyo, J. B.,** Halkiyu, S. B., & Reddy, R. R., Dr. (2017). Road Accidents of Arba Minch Town in Ethiopia: Empirical Study. *International Journal of Civil Engineering*, 4(3), 29-33. <https://doi.org/10.14445/23488352/IJCE-V4I3P107>
5. **Halkiyo, J. B.,** Halkiyu, S. B., & Reddy, R. R., Dr. (2017). Comparison of Behavioral Aspects of High-Rise Multistoried Steel Building with Mass Pendulum System and X-Bracing System Using STAAD. Pro V8i Software. *International Journal of Research in Engineering and Technology*, 6(4), 1-6.
6. **Halkiyo, J. B.,** Halkiyu, S. B., & Reddy, R. R., Dr. (2017). Comparative Study of Low-Rise Residential Buildings in Terms of Plate Stress and Economic Evaluation with Solid Slab and Ribbed Slab: Static Analysis. *International Journal of Engineering Sciences & Research Technology*, 6(7), 186-193. <https://doi.org/10.5281/zenodo.823088>

JOURNAL ARTICLES IN PREPARATION/ UNDER REVIEW (4)

1. **Halkiyo, J. B.** (2025). Systematic Review of Literature: Enhancing Equity and Inclusivity in Engineering Education for Diverse Undergraduate Students. *Australasian Journal of Engineering Education*—Under-Review.
2. **Halkiyo, J. B.,** & Kellam (2025). Culturally Relevant Pedagogy in Engineering Education: A Systematic Review on Influencing Challenges of Equity and Inclusivity. *Journal of Engineering Education*—Under-Review.
3. **Halkiyo, J. B.,** Kellam, N., & Brunhaver, S.. Comparing the Impact of Culturally Relevant Learning Practices on Academic Achievement of International and Domestic Students: A Focus on Undergraduate Engineering Students. *Journal of Engineering Education*—90% completed and will be submitted soon.
4. **Halkiyo, J. B.,** Kellam, N. & Brunhaver, S.. Comparing the culturally relevant learning experiences of domestic and international engineering students: An instrument development and analysis. *Journal of Engineering Education*—90% completed and will be submitted soon.

PEER-REVIEWED CONFERENCE PROCEEDINGS (7)

1. **Halkiyo, J. B.**, Halkiyu, S. B., Halkiyu, A. B., Halkiyu, R. B., Geda, D, & Kellam, N (2024, June). Where are Women Engineering Faculty in Ethiopia? The Stubborn Gender Disparity in Engineering Faculty in Ethiopian Universities. In 2024 ASEE Annual Conference and Expositions. <https://peer.asee.org/48273>
2. **Halkiyo, J. B.**, Jennings, M., Halkiyu, S. B., & Kellam, N. (2023, June). Ethiopian Women Students' Recommendations for Enhancing their Sense of Belonging in Engineering Education. In 2023 ASEE Annual Conference and Expositions. <https://peer.asee.org/43413>
3. **Halkiyo, J. B.** (2022, June). Enhancing the Equity and Inclusivity of Engineering Education for Diverse Learners through an Innovative Instructional Design, Delivery, and Evaluation: International Students in Focus. In 2022 ASEE Annual Conference and Expositions. <https://strategy.asee.org/41209>
4. Davis, S. C., Kellam, N. N., Svihla, V., Vignesh Sundaram, B., & **Halkiyo, J. B.** (2021, July). Powerful Change Attends to Power Relations. In 2021 ASEE Annual Conference Content Access. <https://peer.asee.org/37590>
5. La Place, C., **Halkiyo, J. B.**, Sheppard, M., Kellam, N., & Carberry, A. (2021, October). Cultivating an Additive Innovation Culture through the Communal Observations of New EXperiences in Teaching (CONEXT) Protocol. IEEE In Frontiers in Education. <https://doi.org/10.1109/FIE49875.2021.9637195>
6. **Halkiyo J.B.** (Final Paper Accepted). Enhancing Time Management Skills among Online Students in Higher Education: A Study of Needs, Characteristics, and Instructional Design Interventions. Final paper is accepted for the 2025 ASEE Annual Conference Presentation.
7. **Halkiyo, J. B.** (Final Paper Accepted). Navigating External Pressures: How Government, Family, and Student Needs Shape Female Students Major Choice, Academic Journey, and Career Path. The Case of Female Engineering Students in Ethiopia. Final paper is accepted for the 2025 ASEE Annual Conference Presentation

BOOK PUBLISHED (1)

1. **Halkiyo, J. B.**, Halkiyu, S. B., & Reddy, R. R., Dr. (2018). Fixed Time Traffic Signal and signal synchronization. *Lambert Academic Publishing*, ISBN 978-613-9-92384-7.

TEACHING EXPERIENCES

Arizona State University

Instructor of Record

Aug 05, 2024 – Dec 27, 2024

- *Course: EGR 240: CADD and SolidWorks Modeling—*

Arizona State University

As the instructor of record for EGR 240, I taught a class of 33 students, focusing on advanced 3-D SolidWorks modeling of mechanical parts and the creation of engineering drawings. I demonstrated SolidWorks techniques in the classroom and guided students in generating accurate engineering drawing views. To promote critical thinking, I facilitated discussions by posing open-ended questions and encouraging engagement both in-person and online through Canvas. I employed a variety of active teaching methodologies tailored to meet the diverse needs of my students, including group discussions, reflections on classwork, individual assignments, group projects, and project-based learning experiences. One notable project involved students modeling a tractor composed of 32 parts, performing assemblies, generating drawing views, and creating a complete animation in SolidWorks. To further support student learning, I developed instructional materials and videos that enhanced their SolidWorks skills outside of class. This experiential approach deepened their understanding of technical concepts and improved their collaboration skills. Additionally, I held office hours to provide individualized feedback and assistance with assignments and course projects.

Graduate Teaching Assistant

Aug 18, 2022 – Dec 27, 2023

- *HSE 390: Qualitative Research Methods— Fall 2023, Arizona State University, AZ*

During HSE 390, I consulted students on HSE 390 course projects, which included a course completion requirement. I also graded students' assessments and provided feedback, held office hours, and assisted and managed students with classroom discussions.

- *EGR 313: Mechanical Systems Project II— Spring 2023, Arizona State University, AZ*

During EGR 313, I participated in consulting students on the course project, which included a course completion requirement. Thus, I reviewed students' project work progress phase-wise, provided feedback, and graded the project. Further, I served as a grader on tests, arranged some laboratory equipment in the lab for student service, and had weekly meetings with the instructor of record to support undergraduate engineering students.

- *EGR 217: Fundamental Mechanics, Fall 2022, Arizona State University, AZ*

I worked as a teaching assistant for EGR 217, where I had responsibilities including, but not limited to, managing the course canvas, preparing learning materials for students (e.g., engineering mechanics problems worksheets), creating assignments and posting them, posting announcements to Canvas, grading students' assessments and providing feedback, holding office hours, preparing course maps, assisting and managing students with classroom discussions, and sometimes leading the class.

Bule Hora University

Senior Lecturer

June 2018 – Dec 2020

Civil Engineering Department, Engineering and Technology College, Bule Hora University

Road and Transport Engineering Courses I taught:

- CEng3181: Transport Engineering,
- CEng3182: Highway Engineering I,
- CEng4183: Highway Engineering II,
- CEng5191: Integrated Civil Engineering Design,
- CEng3192: Technical Report & Research Methodology for Engineers,
- CEng5241: Highway Engineering III,
- CEng5242: Railway Engineering

Assistant Lecturer

Oct 2015 – June 2018

Civil Engineering Department, Engineering and Technology College, Bule Hora University

Courses taught for undergraduate engineering students in three engineering departments—Civil Engineering, Water Resource and Hydraulic Engineering, and Construction Technology and Management:

- CEng1041: Engineering Mechanics I,
- CEng1081: Surveying I,
- CEng2082: Surveying II,
- CEng3181: Transport Engineering,
- CEng3182: Highway Engineering I,
- CEng5191: Integrated Civil Engineering Design.

RESEARCH EXPERIENCES

- **Graduate Research Assistant, RED NSF Project, “REvolutionizing engineering and Computer Science Departments” Grant Number: 1519339, Arizona State University, Mesa, AZ, Fall 2020-Summer 2022**

I was a Research Assistant on the NSF research project “*RED: REvolutionizing engineering and Computer Science Departments.*” I conducted thematic analysis and codebook revisions on the Poly Pedagogical Ninja data. I also helped develop an observation protocol to promote additive innovation. I was a co-author of a paper published in IEEE. I presented at FIE 2021 under the title “Cultivating an Additive Innovation Culture through the Communal Observations of New Experiences in Teaching (CONEXT) Protocol.”

- **Graduate Research Assistant, PaiRED NSF Project, “Collaborative Research: PaiRED: Partnering Across Insider-views of RED” Grant Number: EEC 1914578, Arizona State University, Mesa, AZ, Fall 2020-Summer 2022**

In the NSF research project “*PaiRED: Partnering Across Insider-views of REvolutionizing engineering and computer science Departments,*” I helped develop by collecting data, data cleaning, conducting literature reviews, summarizing and reporting findings, and attending and assisting in project meetings. I also co-authored a paper

presented at the ASEE 2021 Conference and Expositions titled “Powerful Change Attends to Power Relations.”

- **Principal Investigator (Qualitative Cross-Cultural Research), Spring 2021 – Sum 2021**

As part of my coursework, I conducted an exploratory qualitative study. Research experience for undergraduate programs aimed to explore gender equity in engineering education in Ethiopia’s university setting. I went through all stages of conducting the professional and ethical study: developing design, developing tools such as interview protocol, codebook, data collection and analysis, and reporting. I collected qualitative primary data (through interviews), analyzed (with Dedoose software to organize and code qualitative data), and wrote qualitative reports. I published one journal article and two conference proceedings as a result of this work. Also, one conference preceding paper exploring the engineering faculty perspective is under review.

- **Principal Investigator (Quantitative Study), Spring 2022 – Sum 2022**

Undergraduate research experiences were conducted to explore engineering education equity and inclusivity among diverse learners, including international and domestic students, with a focus on United States Higher Education Institutions. I experienced all the necessary steps: designing the topic, developing research questions, developing the survey instrument, identifying the theoretical framework, research design, and design analysis approaches, and compiling research work findings. Two papers are going to be submitted to the JEE journal.

- **Principal Investigator (Systematic Literature Review), Spring 2023- Fall 2023**

Following the PRISMA protocol development, I conducted a systematic review, including a comprehensive search of Google databases, screening and selecting studies based on predefined criteria, data extraction, and analysis. Qualitative findings were synthesized to identify common patterns and findings related to the impact of culturally relevant pedagogy on equity and inclusivity in engineering education in contexts: validation of cultural identities, improved learning outcomes, challenges to cultural biases and stereotypes, and bridging opportunity gaps. I wrote a journal article associated with this project and it will be included in my dissertation and will be submitted for publication.

MENTORING EXPERIENCES

(June 2018 – December 2024)

During this period, I had the privilege of mentoring undergraduate engineering students, focusing particularly on individuals from underrepresented groups.

- **Mentorship at Bule Hora University in Ethiopia**

In Ethiopia, I guided two student groups through their thesis projects, providing comprehensive support in: (1) Topic Selection: Assisting students in identifying and refining research topics that align with their interests and the current needs of the engineering field, (2) Data Collection: Offering strategies and methodologies for effective data gathering, ensuring the reliability and validity of their research findings, and (3) SPSS Analysis: Training students in statistical analysis using SPSS software,

enabling them to interpret data accurately and draw meaningful conclusions. My collaborative and supportive approach aimed to build confidence and provide clear direction. This mentorship was fruitful, with three out of the five students becoming lecturers and the remaining two securing positions in government roles. This success has inspired me to continue mentoring in my future academic endeavors.

- **Mentorship at Arizona State University**

At Arizona State University, within the Ira A. Fulton Schools of Engineering at Barrett, The Honors College, I mentored two undergraduate students on a mechanical modeling project. The project involved: (1) Modeling: Designing a 32-part tractor using SolidWorks software, emphasizing precision and attention to detail, (2) Assembly Creation: Developing assemblies for the individual parts, ensuring proper integration and functionality, (3) Animation: Creating animations to demonstrate the operational mechanics of the tractor, enhancing understanding of its functionality, and (4) Engineering Drawings: Generating detailed engineering drawings of the completed tractor parts, adhering to industry standards and practices. Both students completed the project, showcasing their skills in mechanical modeling and design.

Professional Positions Held

March 2024 – June 2024 Officer, F&B Transportation Services LLC, Omaha, NE.

- Led operations at F&B Transportation Services, effectively liaising with team members and overseeing the recruitment of new employees.
- Managed the dispatch and coordination of staff to ensure timely and efficient delivery of transportation services, optimizing workflow and enhancing service quality.

Aug 6, 2018 – Oct 10, 2019 Department Head, Survey Engineering, Bule Hora University

- I served as the Head of the Surveying Engineering Department at Bule Hora University from August 6, 2018, to October 10, 2019. During my tenure, I successfully led and managed departmental activities, coordinating teaching and learning initiatives to enhance the educational experience for students and faculty. I oversaw staff and faculty, ensuring effective collaboration and communication within the department. A significant achievement was facilitating the establishment of a fully equipped surveying engineering laboratory, which provided students with vital hands-on experience. I set strategic goals and objectives for the department, guiding their implementation and ensuring successful outcomes. My leadership fostered an environment of innovation and collaboration, promoting professional development among faculty and enriching the learning experience for students. Through these efforts, I contributed to elevating the department's academic standards and advancing its mission within the university.

RESEARCH AND APPLIED ENGINEERING PROJECTS

2020 – 2021 **Principal Investigator**

Comparative Study of Subgrade Soil Stabilization Using Lime and Selective Soil in Road Pavement Construction

Research and Community Service Office, Bule Hora University, Bule Hora,
Ethiopia
Awarded: 53,020 Ethiopian Birr

2019 – 2020 Project Manager

Flexible Pavement Road Design Detail of Adola Wayu Roadway Segment
Bule Hora University, Bule Hora, Ethiopia
Awarded 357,880,261.38 Ethiopian birr (8,947,006.53 USD)

2018 – 2020 Principal Investigator

Synchronization of fixed time traffic signals along the corridor under mixed traffic conditions in Addis Ababa City, Ethiopia: Re-design/ re-timing of fixed time traffic signals for existing traffic conditions, signal timetabling, scheduling, and real-time dispatching
Research and Community Service Office, Bule Hora University, Bule Hora, Ethiopia
Awarded: 35,936 Ethiopian Birr

2018 – 2020 Project Manager

Extreme Building, Road and Bridge Construction Work PLC
Shashemene, Ethiopia.
Activities: spot repair, dry masonry and check dam construction, repair backslope and foreslope, ditch brush and culvert cleaning

2017 – 2018 Site Engineer / Office Engineer

Bright Construction Enterprise PLC, Ethiopia
Establishment Construction Company by the Ethiopian Roads Authority in the South District. Activities participated: spot repair, dry masonry and check dam construction, repair backslope and foreslope, ditch brush and culvert cleaning, office work on AutoCAD and Eagle Point software.

RESEARCH INTEREST AREAS AND EXPERTISE

Engineering Education Systems and Design

- Engineering education equity and inclusivity among diverse learners, international and domestic students in focus in the United States Higher Education Institutions.
- Diversifying engineering education in Ethiopia, specifically gender diversity.
- Implications of adopting culturally relevant pedagogy to enhance engineering education equity and inclusivity.
- The impact of effective instruction design in engineering education systems.
- Exploring barriers to the quality of engineering education internationally: The case of theory-practice gap/disconnection in engineering teaching-learning processes in Ethiopia.
- The influence of CRP on international students' perceptions and academic engagement in undergraduate engineering education settings.

- Exploring deficit narratives in pedagogical practices and surrounding international students in the U.S. Higher Education Institutions.

INVITED TALKS (2)

Enhancing the Equity and Inclusivity of Engineering Education for Diverse Learners, University of Nebraska – Lincoln, 2022

- [Engineering Education Seminar Exchange Talks](#)

Arizona State University: Center for Science, Technology and Environmental Policy Studies: ASU, 2022

- [Reengineering the Education Experience](#)

SERVICE & COMMITTEES, AND CONFERENCE REVIEWER (10)

2021 Spring – ASEE Conference Paper Reviewer

Present In ASEE's Equity, Culture, and Social Justice in Education Division, Student Division, and International Division, I reviewed scholars' abstracts and papers and provided descriptive feedback, including constructive comments identifying the strengths and areas for further improvements.

2021 Spring – CoNECD Conference Paper Reviewer

Present In the Collaborative Network for Engineering and Computing Diversity conference, I reviewed scholars' abstracts and papers and provided descriptive feedback, including constructive comments identifying the strengths and areas for further improvements.

August 2022 – ASU: GPSA Research Grant Reviewer

August 2023 I worked with GPSA members to advocate for GPSA goals, and regularly attend meetings. Served as a GPSA grant reviewer to review scholars' proposals for Jumpstarts research grant, publication grant, and athletics grant for funding. Service/volunteer work, Arizona State University

August 2022 – Present ASU Graduate College: Teaching and Learning STEM

Community: Panel participation and discussion issues ranging: learning community, active learning strategies, learning through diversity, teaching-learning-research is integrated/different entities? — Arizona State University

2018 – Present World Youth Forum Committee (WYF)

Engaging in enriching step-up activities, exchanging views, and recommending initiatives to decision-makers and influential figures through messages of peace, prosperity, and harmony to the world.

- 2018 – 2020 **Academic Committee (AC)**
College of Engineering & Technology
Bule Hora University, Bule Hora, Ethiopia
- 2015 – 2016 **Engineering College Academic Staff Discipline Committee (ASDC)**
College of Engineering & Technology
Bule Hora University, Bule Hora, Ethiopia
- 2018 – 2019 **Research and Community Service Review Committee (RCSRC)**
College of Engineering & Technology
Bule Hora University, Bule Hora, Ethiopia
- 2019 **Civil Engineering Department Discipline Committee**
College of Engineering & Technology
Bule Hora University, Bule Hora, Ethiopia
- 2019 – 2020 **University-Level Bule Hora Mini-Industry Study Team Member**

AWARDS AND FELLOWSHIPS

- 2024 Arizona State University (ASU)- The Graduate College PhD Completion Fellowship Award (\$12,500.00)
- 2024 Arizona State University (ASU)- The Dissertation Support Award (\$2000.00)
- 2024 ASU – PhD Student Peer Reviewed Paper published award (\$500.00)
- 2023 ASU- Polytechnic NLT General Scholarship (\$7,450.00)
- 2023 ASU- The Polytechnic School: The 2023 TPS Travel Award (\$1,000.00)
- 2022 ASU Graduate & Professional Student Association: GPSA Travel Grant (\$950.00)
- 2022 ASU- The Polytechnic School: The 2022 TPS Travel Award (\$409.00)
- 2022 ASU- University Graduate fellowships Graduate Studies: Univ Grad Fellowship (\$1,940)
- 2020 ASU- Ira A Fulton Department Fellowship for 2020 – 2021 Academic Year (\$5,000.00)
- 2018 Transport Planning and Traffic Engineering Book Award:
Kadayali, 2017 New Edition, School of Post-Graduate Studies, Arba Minch University
- 2008 – 2015 Governmental Local Scholarship Opportunity (Financial grant):

Top 10 High Scorer, Kofale Preparatory and Secondary School, West Arsi Zone
International Non-Government Organization—CDA (NAMA Foundation)

PROFESSIONAL ORGANIZATION MEMBERSHIPS

- American Society for Engineering Education
- American Society for Civil Engineering
- International Oromo Engineering Association
- Arizona State University ASEE membership
- Arizona State University GPSA