

SINEM DEMIRCI, Ph.D.

PERSONAL INFORMATION

E-mail: sdemirci@calpoly.edu

Orcid ID: <https://orcid.org/0000-0002-2095-0674>

Website: <https://sinemdemirci.github.io/>

Google Scholar: <https://tinyurl.com/3vam9js8>

WORK EXPERIENCE

2023 - Present	Statistics Department California Polytechnic State University	Full-Time Lecturer
2022 - 2023	Dept. of Statistical Science, University College London	(Postdoctoral) Visiting Researcher / Lecturer
2021 - 2022	TEDMEM	Social and Educational Research Specialist (Policy Analyst)
2013 - 2020	Dept. of Math. & Sci. Education, Middle East Technical University	Teaching & Research Assistant

EDUCATION

Degree	University	Year of Graduation
Ph.D.	Elementary (Science) Education, Middle East Technical University	2021
M.S.	Statistics, Middle East Technical University	2018
M.S.	Elementary Science and Mathematics Education, Middle East Technical University	2014
B.S.	Elementary Science Education, Middle East Technical University	2011

RESEARCH INTERESTS: Statistics & Data Science Education, Systems Literacy in
Environmental and Sustainability Education

LANGUAGES: English (●), Turkish (●), German (◐)

COMPUTER SKILLS: R Project for Statistical Computing (●), IBM SPSS Software (●),
LISREL (◐), Git /GitHub (◐), HTML/CSS (◐)

AWARDS

2021	Scientific and Technological Research Council of Türkiye (TUBITAK)	2219-Postdoctoral Research Scholarship
2021	European Educational Research Association	Bursary Winner for ECER 2020
2015	Middle East Technical University	Thesis of the Year
2013	Scientific and Technological Research Council of Türkiye (TUBITAK)	2224-A International Scientific Events Support Program

PUBLICATIONS

Peer Reviewed Publications

- Dogucu, M., **Demirci, S.**, Bendekgey, H., Ricci F. Z., & Medina, C. M. (2024, *Under Review*). Undergraduate data science education: Who has the microphone and what are they saying? <https://arxiv.org/abs/2403.03387>
- Demirci, S., Reid, A., Teksoz, G. & Sahin E. (2024, *Under Review*). Systems literacy: Towards a conspectus and model for Environmental and Sustainability Education. *Environmental Education Research*.
- Demirci, S. & İlk, O (2024, *Under Review*). Variable selection via elastic net regression for international large-scale assessments: An application of PISA 2015 data.
- Demirci, S., Dogucu, M., Zieffler, A. & Rosenberg, J. (2023). *Learning Difficulties of Introductory Data Science Students*. In E. Jones (Ed) Proceedings of the International Association for Statistical Education Satellite Conference Online. <https://escholarship.org/uc/item/01p3k7f3>
- Demirci, S., Şahin E., Teksöz, G. & Marcinkowski, T. J. (2021). Pre-Service teachers' beliefs on human population growth in the context of education for sustainable development: development and validation of an instrument. *Journal of Teacher Education for Sustainability*, 23(2), 121-142. <https://doi.org/10.2478/jtes-2021-0021>
- Demirci, S. & Şahin, E. (2018). An analysis of Turkish middle school science education program placing climate change issues in the context of education for sustainable development. *International Journal of Quality in Education*, 2(1), 13-21. URL: <https://dergipark.org.tr/en/pub/ijqe/issue/37135/427929>
- Demirci, S. (2018). The context of sustainable development in Turkish elementary science curriculum. *International Journal of Quality in Education*, 1(1), 54-61. URL: <https://dergipark.org.tr/en/pub/ijqe/issue/37117/427577>
- Demirci, S. & Teksöz, G. (2017). Self-Efficacy beliefs on integrating sustainability into profession and daily life: in the words of university students. *International Electronic Journal of Environmental Education*, 7(2), 116-133. URL: <https://files.eric.ed.gov/fulltext/EJ1180990.pdf>

Demirci, S., Yılmaz, A., & Şahin, E. (2016). Lise ve üniversite öğrencilerinin atomun yapısı ile ilgili zihinsel modellerine genel bir bakış. [An Overview of High School and University Students' Mental Models of the Structure of the Atom]. *Türkiye Kimya Derneği Dergisi, Kısım C: Kimya Eğitimi*, 1(1), 87-106.
URL: <https://dergipark.org.tr/en/pub/jotcsc/issue/30533/330312>

Conference Papers/Presentations

Demirci S., Dogucu, M. Zieffler A. & Rosenberg, J.M. (2023, July). *Learning Difficulties of Introductory Data Science Students* [Paper presentation]. 13th IASE Satellite Conference, Toronto, Canada.

Demirci, S., Reid, A, Teksoz, G. & Sahin E. (2023, April). *Systems Literacy as a Key Concept for Quality Education and Agenda 2030*. [Roundtable Discussion]. AERA 2023 Annual Meeting, Chicago, Illinois, U.S.A.

Demirci, S., Şahin E. & Teksöz, G. (2021, September). *Eight-Graders' Understanding of Hidden Use of Water and Their Action Strategies for Sustainable Use of Water*. [Paper presentation]. European Conference on Educational Research, Geneva, Switzerland

Demirci, S., Şahin E. & Teksöz, G. (2021, September). *Middle School Students' Perceptions on The Interactions among Water Cycle, Global Warming, and Climate Change*. [Paper presentation]. European Conference on Educational Research, Geneva, Switzerland

Demirci, S., Şahin E. & Teksöz, G. (2020, September). *Redefining Urbanization: In the Views of University Students*. [Paper presentation]. 5th International Symposium on Environment and Morals, The Republic of Türkiye

Demirci, S. & Teksöz, G. (2020, September). *Pre-service Teachers' Perceptions on The Interactions between COVID-19 Pandemic and the Environment*. [Paper presentation]. 5th International Symposium on Environment and Morals, The Republic of Türkiye

Demirci, S. & Teksöz, G. (2018, June). *Pre-service Science Teachers' Skills on Problem/Issue Analysis in Environmental Education*. [Paper presentation]. ERPA International Congresses on Education, Istanbul, The Republic of Türkiye

Demirci, S. (2018, June). *Middle School Students' Mental Models of The Water Cycle*. [Paper presentation]. ERPA International Congresses on Education, Istanbul, The Republic of Türkiye

Teksöz, G. & **Demirci, S.** (2017, August). *About The Context of Climate Change Education for Sustainability: In The Words of University Students*. [Paper presentation]. 12th Biannual Conference of The European Science Research Association (ESERA), Dublin, Republic of Ireland

Demirci, S., Kaplan, G., Cengizoğlu, S., & Şen, M. (2017, April). *Pre-service teachers' Understandings of sustainability based on ontological entities*. [Paper presentation]. 26th International Conference on Educational Sciences, Antalya, The Republic of Türkiye

- Cengizoğlu, S & **Demirci, S.** (2016, September). *Türkiye’de Yaşayan Çocuklar ve Çevre-İnsan İlişkisi: Bir İçerik Analizi Çalışması*. [Paper presentation]. UFBMEK 2016, Trabzon, The Republic of Türkiye
- Demirci, S. & Cengizoğlu, S. (2016, September). *Türkiye’de Okul Öncesi Dönemde Fen Eğitimi’nde Yapılan Çalışmaların Bölgelere, Değişkenlere ve Örneklem Gruplarına Göre İçerik Analizi*. [Poster presentation]. UFBMEK 2016, Trabzon, The Republic of Türkiye
- Demirci, S. & Şahin E. (2016, May). *An Analysis of Turkish Middle School Science Education Program Placing Climate Change Issues in The Context of Education for Sustainable Development*. [Paper presentation]. The 14th International JTEFS/BBCC Conference Sustainable Development, Culture, Education: Innovations and Challenges of Teacher Education for Sustainable Development, Konya, The Republic of Türkiye
- Demirci, S. (2016, May). *The Context of Sustainable Development in Turkish Elementary Science Curriculum*. [Paper presentation]. The 14th International JTEFS/BBCC Conference Sustainable Development, Culture, Education: Innovations and Challenges of Teacher Education for Sustainable Development, Konya, The Republic of Türkiye
- Demirci, S.& Şen, M. (2016, April). *Pre-Service Science Teachers' Misconceptions About Density and Buoyancy*. [Paper presentation]. The annual meeting of NARST International Conference toward Equity and Justice: Many Different Voices, Cultures, and Languages in Science Education Research for Quality Science Learning and Teaching, Baltimore, Maryland, U.S.A.
- Demirci, S., Şahin E. & Teksöz, G. (2015, October). *Is The Carrying Capacity Exceeded? Preservice Teachers' Beliefs on Human Population Growth*. [Paper presentation]. The annual meeting of North American Association in Environmental Education, San Diego, California, U.S.A.
- Demirci, S., Şahin, E. & Yılmaz. A. (2015, September). *The Effects of History of Science on Students' Mental Models Regarding Atomic Models*. [Poster presentation]. 11th Biannual Conference of The European Science Research Association (ESERA), Helsinki, Finland
- Yılmaz, A., Şahin, E. & **Demirci, S.** (2015, September). *Lise ve Üniversite Öğrencilerinin Atomun Yapısı ile İlgili Zihinsel Modellerine Genel Bir Bakış*. [Paper presentation]. 4. Ulusal Kimya Eğitimi Kongresi, Balıkesir, The Republic of Türkiye
- Demirci, S. & Şen, M. (2015, September). *Fen Bilgisi Öğretmen Adaylarının Yoğunluk Konusunda Kavram Yanılgılarının Belirlenmesi*. [Paper presentation]. 2. Ulusal Fizik Eğitimi Kongresi, Ankara, Türkiye
- Demirci, S., Şahin E. & Teksöz, G. (2015, June). *An Exploration of University Students' Beliefs on The Sustainable Growth of Human Population*. [Paper presentation]. 8th World Environmental Education Congress (WEEC), Gothenburg, Sweden
- Demirci, S. & Teksöz, G. (2015, April). *ESD in Higher Education: University students' perceptions of sustainability and its relation to their self-efficacy beliefs to integrate*

sustainability into their profession and daily lives. [Poster presentation]. The Pathways to The Future: Education for Sustainable Development, Tallinn, Estonia

Şahin, E., Yılmaz, A. & Demirci, S. (2015, April). *A Review of Elementary Students' Conceptual Understandings of 'Atom.* [Paper presentation]. International Organization for Science and Technology Education (IOSTE), İstanbul, The Republic of Türkiye

Demirci, S. & Teksöz, G. (2014, September). *Üniversite Öğrencilerinin Sürdürülebilir Kalkınma Kavramını Gelecekteki Meslekleri Ve Günlük Yaşamlarına Birleştirmek Konusundaki Öz-yeterlik İnanışları.* [Paper presentation]. UFBMEK 2014, Adana, The Republic of Türkiye

Demirci, S., Şahin E. & Teksöz, G. (2014, April). *What does a Survey Study on Beliefs towards Human Population Growth Imply for Teacher Education?* [Paper presentation]. EJER 2014 Congress, İstanbul, The Republic of Türkiye

Demirci, S., Şahin E. & Teksöz, G. (2013, October). *Determining Pre-service Teachers' Beliefs towards Human Population Growth.* [Paper presentation]. The annual meeting of North American Association in Environmental Education, Baltimore, Maryland, U.S.A.

Çokoğlu, S. & Şahin, E. (2012, May). *Beliefs toward Population Growth in Türkiye.* [Paper presentation]. 1. Ulusal Disiplinlerarası Çevre Kongresi, Sakarya, The Republic of Türkiye

Book Chapters about Education Policies

TEDMEM. (2022). *Seçimlerde eğitimin yeri: Siyasi partilerin vaatleri, seçmenlerin beklentileri* [The role of education in elections: Promises of political parties, expectations of voters] (TEDMEM Güncel Yayınlar Dizisi 7). Türk Eğitim Derneği. ISBN: 978-605-74377-3-0. <https://tedmem.org/yayinlar-detay/seci-mlerde-egi-ti-mi-n-yeri-si-yasi-parti-leri-n-vaatleri-secmenleri-n-beklenti-leri>

Demirci S. (2022). Öğretmenlik ve mesleki süreç [Teaching and teacher education]. In TEDMEM (Ed.). *2021 eğitim değerlendirme raporu* [2021 education assessment report]. (TEDMEM Değerlendirme Dizisi 8) (pp.147-159). Türk Eğitim Derneği. ISBN: 978-605-74377-2-3. <https://tedmem.org/yayinlar-detay/2021-egi-ti-m-degerlendi-rme-raporu>

Demirci S. (2021). Öğretmenler, öğrenme ortamları ve okullar [Teachers, learning environments, and schools]. In TEDMEM (Ed.). *Bir bakışta eğitim 2021* [Education at a Glance 2021]. <https://tedmem.org/yazilar-detay/bir-bakista-egitim-2021>

TEDMEM (2021). *20. Millî Eğitim Şûrası konularına ilişkin görüş ve öneriler* [Remarks and Recommendations on the themes of the 20th National Education Council] (TEDMEM Güncel Yayınlar Dizisi 6). Türk Eğitim Derneği. ISBN: 978-605-74377-1-6. <https://tedmem.org/yayinlar-detay/20-mi-lli-egi-ti-m-surasi-konularina-i-li-ski-n-gorus-ve-oneri-ler>

Demirci S. (2021). Salgın sürecinde dünyada ve Türkiye’de eğitimin bir yılı [One year in education in the world and in The Republic of Türkiye during the pandemic]. In TEDMEM (Ed.). *Türkiye'nin telafi eğitimi yol haritası* [The Republic of Türkiye's

education recovery roadmap] (TEDMEM Analiz Dizisi 9) (pp.7-22). Türk Eğitim Derneği. ISBN: 978-605-74377-0-9. <https://tedmem.org/yayinlar-detay/turki-ye-ni-n-telafi-egi-ti-mi-yol-hari-tasi>

Other Publications

Demirci (2023). Does current curricula hinder student understanding of complex global water systems? *EERA Blog*. <https://blog.eera-ecer.de/complex-global-water-systems/>

Demirci S. (2021). Öğretmenlerin dijital yeterlikleri [Teacher Digital Competencies]. <https://tedmem.org/yazilar-detay/ogretmen-dijital-yeterlikleri>

Demirci, S. (2021). COVID-19 ve dünyada okulların durumu [COVID-19 and The Status of The Schools Worldwide]. <https://tedmem.org/yazilar-detay/covid-19-ve-dunyada-okullarin-durumu>

PROJECT EXPERIENCE

Project title: Pedagogical Content Knowledge in Data Science Education: An Assessment of Readiness to Teach Data Science in Higher Education

PI: Dr. Sinem Demirci

Co-PI: Assist. Prof. Dr Mine Dogucu – UCL

Partners/Collaborators: Teaching Assoc. Prof. Dr Andrew Zieffler – University of Minnesota
Assist. Prof. Dr Joshua M. Rosenberg – University of Tennessee, Knoxville

Funded by: The Scientific and Technological Research Council of Türkiye, TÜBİTAK

Sponsored by: University College London

Role & time spent: Principal Investigator, 01.08.2022 - 31.07.2023

Project title: From Waste to Fertilizer 3 - Composting

PI: Dr. Serap Bilen (METU, Society and Science Application and Research Center)

Supported by: The Scientific and Technological Research Council of Türkiye, TÜBİTAK

Role & time spent: Trainer, 08.04.2019 - 19.04.2019 *Project No:* 218B226

Project title: From Waste to Fertilizer 1 - Composting

PI: Dr. Serap Bilen (METU, Society and Science Application and Research Center)

Supported by: The Scientific and Technological Research Council of Türkiye, TÜBİTAK

Role & time spent: Trainer, 09.10.2017 -30.10.2017

Project No: 117B056

Project title: In-service Science Teachers' Teaching Experiences on Atomic Models within the context of History of Science

PI: Assoc. Prof. Dr. Elvan Şahin (METU, Dept. of Science and Mathematics Education)

Supported by: Scientific Research Projects Coordination Unit, METU

Role & time spent: Researcher, 1.1.2015 -31.12.2015

Project No: BAP-05-06-2015-001

Project title: University Students' Beliefs on Human Population Growth

PI: Assoc. Prof. Dr. Elvan ŞAHİN (METU, Dept. of Science and Mathematics Education)

Supported by: Scientific Research Projects Coordination Unit, Middle East Technical University

Role & time spent: Researcher, 1.1.2013 - 31.12.2013 *Project No:* BAP-07-03-2013-010

TEACHING EXPERIENCE

CALIFORNIA POLYTECHNIC STATE UNIVERSITY

Course Code	Course Name	Quarter
STAT 217	Introduction to Statistical Concepts and Methods	Spring 2024
STAT 218	Applied Statistics for the Life Sciences	Fall 2023 – Winter 2024

UNIVERSITY COLLEGE LONDON

Course Code	Course Name	Term
STAT0004	Introduction to Practical Statistics	Term 2 – (Winter 2023)

MIDDLE EAST TECHNICAL UNIVERSITY

Course Code	Course Name	Number of Semesters
MSE 501	Educational Statistics	8 Semesters (2014 – 2020)
MSE 409 & 410	Practice Teaching, I & II	6 Semesters (2016 – 2020)
MSE 487	Environmental Science	5 Semesters (2014 – 2020)
MSE 474	Education and Awareness for Sustainability	3 Semesters (2014 – 2020)
MSE 309	Statistical Applications in Education	3 Semesters (2016 - 2020)
ELE 477	Laboratory Applications in Environmental Education	2 Semesters (Spring 2012 & 2017)
MSE 305	Assessment of Learning in Science and Mathematics	2 Semesters (2014 – 2015)
MSE 288	Community Service	2 Semesters (2017 – 2019)
MSE 502	Research Methods and Ethics	1 Semester (Spring 2019)
MSE 602	Advanced Educational Research	1 Semester (Fall 2016)
MSE 301	Methods of Science Teaching in Middle Schools I	1 Semester (Spring 2017)
MSE 302	Methods of Science Teaching in Middle Schools II	1 Semester (Spring 2018)
MSE 531	Readings in Science Education	1 Semester (Fall 2017)
MSE 475	Climate Change Education for Sustainability	1 Semester (Spring 2014)
MSE 536	Skills on Environmental Issue Investigation	1 Semester (Fall 2014)

JOURNAL/CONFERENCE PROPOSAL REVIEWING

Journal/Event	Year
Journal of Statistics and Data Science Education	2024
Journal of Turkish Science Education	2024
AERA Annual Meeting	2024
USPROC The Undergraduate Statistics Project Competition	2022 – 2023
IASE Satellite Conference 2023 Proceedings	2023
NAAEE Proposal Review Team	2023
e-Kafkas Journal of Educational Research	2023
Environmental Education Research	2022 – Present
Van Yüzüncü Yıl University Journal of Education	2022 – 2023
E-International Journal of Educational Research	2020
NAAEE Proposal Review Team	2014 – 2015 & 2023

WORKSHOPS & INVITED TALKS

Demirci S. [Evolving Landscape of Data Science Education: From Instructor Pedagogy to Policy Perspectives](#). Invited talk at California State University, Fullerton, Department of Mathematics, February 2, 2024.

Demirci S. Pedagogical Content Knowledge in Data Science Education: An Assessment of Readiness to Teach Data Science in Higher Education. Invited talk at MAPS Education Forum: Education Research and Dissemination, University College London, July 11, 2023.

Demirci S. Pre-service Teachers' Understanding of Sustainability: Evidence from Türkiye. Invited talks at UCL ZJU Project Symposium: Promoting education about and for sustainable development, University College London, Institute of Education, [Online](#), June 14, 2023.

Demirci S. An Introduction to Systems Thinking and Systems Literacy. Invited lecture given at the course of PRED 480 Environmental Education, TED University, Department of Elementary Education, [Online](#), May 23, 2023.

Demirci S. Pedagogical Content Knowledge in Data Science Education: An Assessment of Readiness to Teach Data Science in Higher Education. Invited talks at Teaching in Mathematical and Statistical Sciences (TMSS) Seminars, University College London, Department of Statistical Science, [Online](#), May 10, 2023.

Dogucu, M. & Demirci, S. [Disseminating Collaborative and Reproducible Research](#). Workshop given at the Department of Statistical Science, University College London. London, UK, Feb 2023.

Demirci, S. Middle School Students' Water Systems Literacy: A Multiple Case Study Example. Invited lecture given at the course of MSE 346 Teaching Complex Systems in Science, Middle East Technical University, Department of Mathematics and Science Education, Online, November 25, 2022

Demirci, S. How To Prepare a Conference Paper Presentation. Invited talk at the course of MSE 599 M.Sc. Seminar, Middle East Technical University, Department of Mathematics and Science Education, Online, November 2022

Demirci, S. Youth Responsibilities in The Climate Crisis. Invited talk as a part of Access Project Events (Project Partners: FHI 360, US Embassy Ankara and Turkish Education Association), Online, February 1, 2022

Demirci, S. İklim Değişikliğinin Bilimi, Sebepleri, Sonuçları ve Çözüm Önerileri [Climate change: Science, Causes, Impacts, and Solutions.] Invited talk as a part of TEDMEM Event at Turkish Education Association, Online, August 20, 2021

Demirci, S. How To Prepare a Conference Paper Presentation. Invited talk at the graduate seminar course, Middle East Technical University, Department of Mathematics and Science Education, Online, 2021

Demirci, S. Climate change: Science, Impacts, and Solutions. Invited talk as a member of Climate Reality Leadership Corps at the course of MSE 487 Environmental Science, Middle East Technical University, Department of Mathematics and Science Education, December, 2020, Ankara, Türkiye

Demirci, S. Climate change: Science, Impacts, and Solutions. Invited talk as a member of Climate Reality Leadership Corps at the course of MSE 487 Environmental Science, Middle East Technical University, Department of Mathematics and Science Education, Fall 2016, Ankara, Türkiye

Demirci, S. Climate change: Science, Impacts, and Solutions. Invited talk as a member of Climate Reality Leadership Corps at the course of MSE 475 Climate Change Education for Sustainability, Middle East Technical University, Department of Mathematics and Science Education, Spring 2016, Ankara, Türkiye

Demirci, S. Climate change: Science, Impacts, and Solutions. A total of 10 talks were given as a member of Climate Reality Leadership Corps at the Middle East Technical University between October 2013 - June 2014, Ankara, Türkiye

ACTIVITIES, MEMBERSHIPS & SERVICE TO THE FIELD AND UNIVERSITY

American Statistical Association, May 2023 – Present

Associate Fellow, Higher Education Academy, May 2023 – Present

Judge at Undergraduate Statistics Project Competition and Electronic Undergraduate Statistics, Research Conference ([USPROC](#)), Fall 2022 – Present

Early Career Member, American Educational Research Association, January 2023 - Present

Organizing Committee Member, TED International Education Forum – Digital Obesity, Ankara, Türkiye, May 2021

Jury Member, Science Fair of ODTÜ Geliştirme Vakfı Okulları, Ankara, Türkiye, 2013 – 2016 & 2020

Volunteer at [Science through ART](#), The European Researchers' Night event funded under the European Union's Horizon 2020 program, organized by the METU Society and Science Application and Research Center, METU Campus in September 2019

Volunteer at [Science@Home](#), The European Researchers' Night event funded under the European Union's Horizon 2020 program, organized by the METU Society and Science Application and Research Center, METU Campus in September 2017

Volunteer at [Science is Fun! @METU](#) event, organized by the METU Society and Science Application and Research Center, METU Campus, November 4, 2012

Student Member, North American Association for Environmental Education, 2013 – 2014

Member, METU Scouts Student Club, Ankara, The Republic of Türkiye, 2006 – Present

Leader, METU Scouts Student Club, Ankara, The Republic of Türkiye, 2009 – 2011

Head of Education Committee, METU Scouts Student Club, Ankara, The Republic of Türkiye, 2009-2010

COMMUNITY SERVICE

Volunteer at the charity event for suburban middle school students, Ankara, The Republic of Türkiye, 2022-2023

Volunteer at organizing weekend supplementary classes for the middle school students of “Okula Yüz Verin” project, METU Alumni, Ankara, The Republic of Türkiye, 2013-2014

Volunteer at the Charity Project of Construction of School Building “Okula Yüz Verin”, METU Alumni, Ankara, The Republic of Türkiye, 2010-2014

Volunteer at the project of studying with visually impaired students “Engelsiz ODTÜ”, Ankara, The Republic of Türkiye, 2009-2010

Youth Summer Camp Leader at Middle East Technical University, Ankara, The Republic of Türkiye, 2009

Volunteer at Project of Collecting, Sorting, and Recycling Waste “Temiz Eymir”, Ankara, The Republic of Türkiye, 2008-2010

Volunteer at annual charity events for suburban elementary school students in Ankara, The Republic of Türkiye, 2006-2011

Volunteer at organizing wheelchair basketball game, 2010

PERSONAL INTERESTS: Camping, Pilates, Western concert flute (beginner)