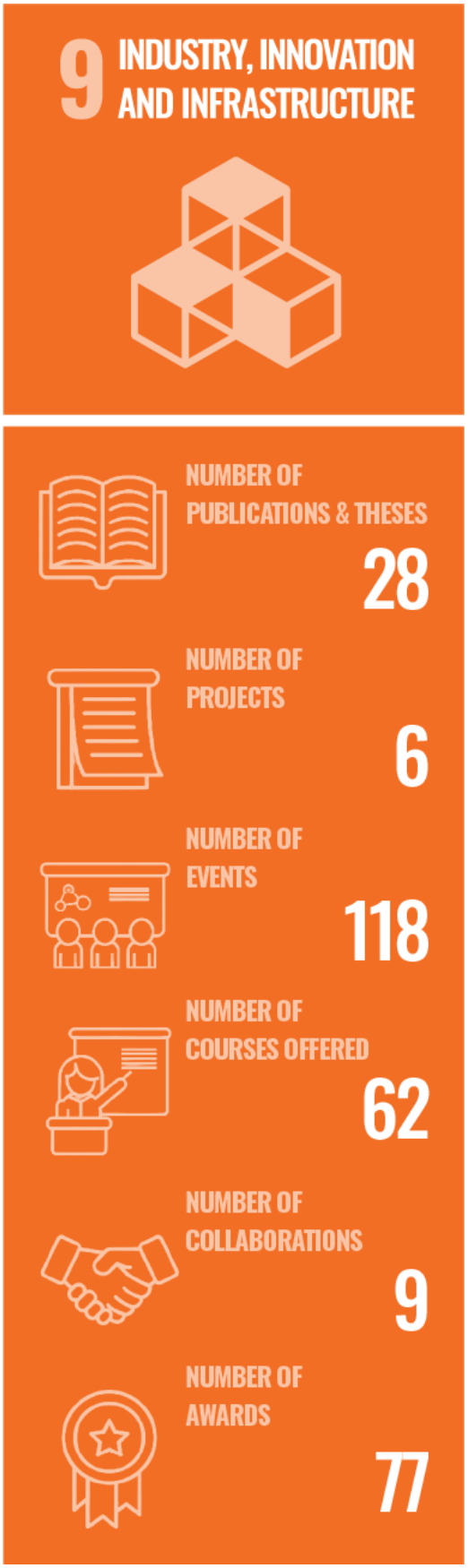

SDG 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Targets and Indicators

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked

developing countries and small island developing States

9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020

Courses, Theses, Publications

In line with their content, departments of Mathematics, Business Administration, Civil Engineering, Electrical and Electronics Engineering, Industrial Engineering, Mechanical Engineering offer a variety of courses directly related to develop reliable, sustainable, and resilient infrastructure. As these departments are dedicated to follow the trends in science and technology in their respective fields, Engineering departments specifically focus on the development of innovative design and technologies.

These departments such as the Department of Economy and Architecture offers courses “Economics of Artificial Intelligence” (ECON 376) and “Research on Architectural Tectonics” (ARCH 445) focusing on manufacturing and service-sector productivity.

In addition to the courses given, academic publications of academic staff on the measurement of manufacturing and service-sector productivity based on film-level data aims to disseminate SDG 9 targets.

Events - Activities

The 2024 Cyber Security Winter Camp, organized in collaboration with Siber Anadolu Communities and CyberTEDU, was held at TEDU. Participants received hands-on training from industry experts, enhancing their technical skills and fostering professional networks. The event contributed to strengthening digital infrastructure and cyber resilience, essential components of SDG 9 (See Image 1. Cyber Security Winter Camp).

Image 1. Cyber Security Winter Camp

Evidence:
https://society.tedu.edu.tr/en/whats-happening-tedu/cyber-security-winter-camp

Huawei Cloud Day: The Huawei Cloud Day event, hosted on December 16, 2024, at the TEDU Multi-Purpose Hall, brought together technology professionals, academics, and entrepreneurs. Expert speakers discussed cloud computing, mobile technologies, artificial intelligence, and digital transformation, offering insights into the future of industrial innovation. The event promoted knowledge exchange and innovation capacity-building (See Image 2. Huawei Cloud Day).

Image 2. Huawei Cloud Day

During the event, expert speakers in their fields discussed hot topics such as Cloud

Technologies, Mobile Technologies, Artificial Intelligence and Digital Transformation. Participants were informed about the latest innovations in the sector. In addition, participants had the opportunity to meet with industry leaders and expand their business networks.

Huawei Cloud Day offered a program full of inspiring speeches and innovative ideas; it was a unique experience for technology professionals, academics, university students and entrepreneurs.

Evidence:
https://www.instagram.com/p/DDWdZL1KxFm/

TEDU JAM: This event, held at TEDU on March 8-10, met with participants as an unforgettable experience where creativity and collaboration reached their peaks (**See Image 3. TEDU JAM Innovation Marathon**). Within the scope of an intensive and inspiring program for three days, there were meet and greet events, sponsor introductions, seminars given by experts in the field, mentor support hours, night refreshments and presentations of creative projects. TEDU JAM offered a creative platform where innovative ideas were put forward and productivity was maximized for both students and participants.

Image 3. TEDU JAM Innovation Marathon.

Evidence:
https://society.tedu.edu.tr/en/whats-happening-tedu/tedu-jam

Urban Housing and Community Modulations: Students from the Department of Architecture presented their projects on Housing and Community Modulations in Urban Ruins, contributing design-based solutions for sustainable reconstruction and resilient infrastructure (See Image 4. Urban Housing and Community Modulations).

Image 4. Urban Housing and Community Modulations

Evidence:
https://www.instagram.com/p/C7jKNMDNSm8/

Renewable Energy and Innovation Talk: A meeting was held with Enis Şahin, General Manager of EMEK Elektrik Endüstrisi A.Ş., during which he shared his expertise on entrepreneurship, the energy sector, and renewable energy technologies, while also addressing recent industry developments. The event, attended with great interest by students of the Faculty of Engineering, provided valuable insights into sustainable industrial practices and innovative approaches in energy infrastructure, highlighting the critical role of technological advancement and resilient industrial development in promoting sustainable economic growth.

Image 5. Renewable Energy and Innovation Talk

Evidence: https://avesis.tedu.edu.tr/etkinlik-organizasyonu/70acefd5-e970-4982-b31d-d780b2c5a70c/emek-elektrik-endustrisi-a-s-genel-muduru-enis-sahin-etkinligi-etkinlik-organizasyonu

TechAnkara Maker Program Hackathon: The TechAnkara Maker Program Hackathon Technology and Coding Competition, organized in collaboration with Ankara Development Agency, Bilişim Garajı, and TEDU, provided middle school students aged 8–14 with the opportunity to develop innovative solutions to mitigate the adverse effects of natural disasters using Arduino, electronic circuit components, and mBlock programming (See Image 6. TechAnkara Maker Program Hackathon). Through hands-on training focused on problem-solving, critical thinking, and algorithmic reasoning, students were encouraged to transition from technology consumers to technology creators. The competition fostered technological literacy and innovation skills, aligning with the principles of sustainable industrial development and resilient infrastructure. By promoting the design and implementation of technology-driven solutions, the event contributes to enhancing innovation capacities among youth, supporting inclusive and forward-looking approaches to industrial and technological advancement, and exemplifying early education initiatives that underpin long-term sustainable development in line with global industry and innovation objectives.

Image 6. TechAnkara Maker Program Hackathon

Evidence: https://ankaraka.org.tr/en/techankara-maker-program-hackidhon-technology-and-coding-competition-2024-award-ceremony

Solution Challenge 2024: The Solution Challenge 2024 program engaged participants in identifying and developing innovative technological solutions to contemporary industrial and infrastructural challenges. By fostering collaboration, problem-solving, and design thinking skills, the program encouraged participants to create scalable and sustainable solutions that enhance industrial efficiency, infrastructure resilience, and technological capacity (See Image 7. Solution Challenge 2024).

Image 7. Solution Challenge 2024

Through mentorship, workshops, and hands-on project development, participants applied engineering, digital tools, and innovative methodologies to real-world problems, promoting the integration of technology and innovation in practical contexts. The program contributes to building the next generation of innovators and strengthening industry-academia collaboration, while supporting sustainable industrial and technological development.

Evidence: https://avesis.tedu.edu.tr/etkinlik-organizasyonu/595f4467-54bc-47e5-a898-391348fd8be5/solutionchallenge2024-etkinlik-organizasyonu

Collaboration, Projects, Awards

Girisim'23: The Girişim'23 event held on May 7–8, 2024, at The Ankara Hotel ATG-AVM, showcased TEDU's AFETTEK Platform as a coordinating hub for entrepreneurship and innovation in disaster and emergency technologies. Through panel discussions and exhibitions, the event emphasized the role of technological entrepreneurship in resilient infrastructure (See Image 8. Girişim'23 Entrepreneurship Event).

Image 8. Girişim'23 Entrepreneurship Event

On the first day, visitors were introduced to the AFETTEK Platform and its members. On the second day, the Entrepreneurship in Disaster and Emergency Technologies Panel was held, moderated by Mustafa Atilla, Chair of the Board of the Bilim Ağacı Foundation. During the panel, Tugay Yılmaz Berk, Board Member of AKUT, shared his field experiences; Pınar Baran, Branch Manager of İşbank Ankara Entrepreneurship Branch, discussed support mechanisms for entrepreneurs; and Prof. Dr. Güney Özcebe, Advisor to the Rector of TEDU, presented the ongoing activities of the AFETTEK Platform.

Evidence:
https://www.tedu.edu.tr/en/node/29135

Projects

OPTIMIST Project (Optimizing Digital Task Implementation in School Teaching): this project funded under the Erasmus+ School Education Program, aims to develop innovative digital teaching models. By integrating data-driven tools and cross-national collaboration, the project contributes to inclusive digital infrastructure and educational innovation (See Image 9. OPTIMIST Digital Education Project).

Image 9. OPTIMIST Digital Education Project

The OPTIMIST project has been awarded €250,000 for a duration of 36 months (01.10.2024 – 30.09.2027). The project builds upon the outcomes of a previous EU project coordinated by Assoc. Prof. Dr. Ufuk Balaman from the Department of English Language Teaching, Faculty of Education, TEDU, and on the research-based design of the DigiTask application (https://www.digitask.app/).

It aims to further develop and adapt DigiTask for use in lower secondary English classrooms, addressing the digital and pedagogical needs of both students and teachers, and to promote its widespread implementation.

In line with the technology-mediated, task-based language teaching approach, digital classroom implementations will be carried out in Turkey, Austria, and Italy at the lower secondary level. The project will produce model tasks, online activity pools, open-access instructional materials, and research outputs, all of which will contribute to a data-driven teacher education framework.

Through the active collaboration of TEDU and TED Ankara Middle School, the project will provide an innovative, globally accessible digital education solution that advances English language teaching. The TEDU project team consists of Assoc. Prof. Dr. Ufuk Balaman and Assist. Prof. Dr. Semih Ekin.

AFETTEK Platform: The AFETTEK Platform, coordinated by TEDU, continues to lead national collaboration in disaster and emergency technologies (**See Image 10. AFETTEK Coordination Meeting**).

Image 10. AFETTEK Coordination Meeting

The 9th Coordination Meeting of the Founders of the Disaster and Emergency Technologies Platform (AFETTEK) was hosted by İzmir University of Economics. The meeting was attended by representatives from TEDU, Başkent University, İzmir University of Economics, Ankara Chamber of Industry 1st Organized Industrial Zone, the Supreme Organization of Organized Industrial Zones (OSBÜK), OSTİM Medical Industry Cluster, Başkent University BİYOTEK Technology Development Center, the Bilim Ağacı Foundation, and AKUT Search and Rescue Association.

The event began with an opening speech by Prof. Dr. Y. Hakan Abacıoğlu, Rector of İzmir University of Economics. Prof. Dr. İhsan Sabuncuoğlu, Rector of TEDU and the institution responsible for AFETTEK's overall coordination, presented the latest developments regarding the establishment process of the foundation that will constitute the Platform's legal entity. Mustafa Atilla, Chair of the Bilim Ağacı Foundation, discussed potential actions to ensure the strategic vision and sustainability of the upcoming foundation.

Ömür Demir Kızılarslan, General Coordinator of the AFETTEK Platform, provided an overview of the work carried out following the 8th Coordination Meeting and outlined short-term planned activities. Participants exchanged views and suggestions on the institutional identity, strategic plan, branding process, sustainability, governance structure, operational framework, and the added value that the foundation is expected to generate once established.

Autonomous RC Car Project: This research initiative, supervised by T.K. Çapın and A. Bolat (Principal Investigator), with contributions from Ö. Basık, A.E. Büyükdoğan, K. Güler, and D. Ertuğrul, focuses on the development of autonomous remote-controlled (RC) vehicle technology.

This study focuses on the development of autonomous remote-controlled (RC) vehicle technology as a contribution to advancing industrial innovation and intelligent infrastructure systems. Autonomous RC vehicles, which hold significant importance in modern industrial applications, have the potential to provide innovative solutions in various domains such as logistics, transportation, security, and entertainment. The primary objective of this research is to establish a comprehensive framework for the development of an autonomous RC vehicle capable of independent operation. This framework integrates sensor technologies, artificial intelligence algorithms, and control systems to enable the vehicle to perceive and interact with its environment safely and efficiently. Ultimately, the study aims to enhance the technological potential of autonomous RC vehicles and to provide a foundation for their integration into diverse real-world applications, thereby supporting progress in automation and smart system development.

Ruling the Future*:* The BAP Research Project titled *"Ruling the Future: Implicit Motivators of People's Gendered Perceptions and Preferences of Voice Assistants"* is conducted under the supervision of B. Türkoğlu Demirel.

This project examines the gendering of artificial intelligence (AI) technologies through the example of voice assistants (VAs), such as Apple's Siri, Amazon's Alexa, and Microsoft's Cortana. Although these systems are increasingly embedded in daily life through information retrieval, personalized recommendations, and decision-making, the predominance of female-voiced assistants reflects and reinforces existing gender stereotypes. Such design choices risk normalizing traditional gender roles and limiting the inclusivity of emerging technologies.

The research aims to investigate people's perceptions and preferences regarding gendered (female and male) and non-gendered (gender-neutral) voice assistants. Drawing on psychological methods and cross-cultural analysis, two experimental studies will be conducted in Turkish and English. Study 1 will explore the factors influencing Turkish participants' perceptions of voice assistant gender and message type, while Study 2 will replicate the design with English-speaking participants to assess the role of language and cultural context.

By providing empirical insights into how users respond to gendered and gender-neutral AI systems, this project contributes to the development of more inclusive, ethical, and user-centered technologies. The findings are expected to inform innovative design practices that promote diversity and equity in technological development, ultimately supporting the creation of fairer and more responsible infrastructures for future AI applications.

Corporate Sustainability and Sustainability Reporting in Türkiye: The BAP Research Project titled *"Corporate Sustainability and Sustainability Reporting in Türkiye"* is conducted under the supervision of I. S. Yılmaz (Principal Investigator), with contributions from A. Tekin Koru, N. N. Dinçer, and B. Yaşar.

This project investigates the evolving landscape of sustainability reporting among Turkish companies listed on Borsa Istanbul (BIST). As the demand for transparency and accountability in environmental, social, and governance (ESG) performance continues to rise, the quality and consistency of corporate sustainability disclosures have become a central concern for both practitioners and scholars. The introduction of the Turkish Sustainability Reporting Standards (TSRS) by the Public Oversight, Accounting and Auditing Standards Authority in December 2023 marks a significant institutional milestone in establishing a national reporting infrastructure. Beginning in 2024, companies exceeding the specified thresholds are required to publish sustainability reports,

which will be released in 2025 using 2024 data.

This research aims to conduct a systematic analysis of these sustainability reports by assessing their coherence, comparability, and alignment with both national and internationally recognized reporting frameworks. Through longitudinal and cross-sectoral evaluation, the project seeks to identify best practices, emerging trends, and the primary challenges faced by Turkish companies in adapting to mandatory reporting requirements.

By providing empirical insights into the transition from voluntary to standardized sustainability reporting, this study contributes to the enhancement of corporate accountability mechanisms and the strengthening of institutional capacities that underpin sustainable industrial development. The findings are expected to inform innovation in reporting practices, foster the creation of resilient corporate infrastructures, and guide policymakers, researchers, and practitioners in promoting transparent and responsible business ecosystems.

Smart Building Technologies Fellowship: Zehra Dağıstan, a student from the Department of Architecture, received the TUBITAK 2247-C Intern Researcher Fellowship (STAR) to work on the Smart Building Technologies Project under Assoc. Prof. Dr. İpek Gürsel Dino. This project, part of the Advanced Technologies for Sustainable Cities Platform, supports urban innovation and intelligent infrastructure (See Image 11. Smart Building Technologies Fellowship).

Image 11. Smart Building Technologies Fellowship

Zehra will work under the mentorship of Assoc. Prof. Dr. İpek Gürsel Dino in the Smart Building Technologies project of the Advanced Technologies for Sustainable Cities Platform, which is supported by TUBITAK and led by Prof. Dr. Elif Uysal.

Evidence: https://www.tedu.edu.tr/en/whats-happening-tedu/zehra-dagstan-tubitak-2247-c-intern-researcher-scholarship-program