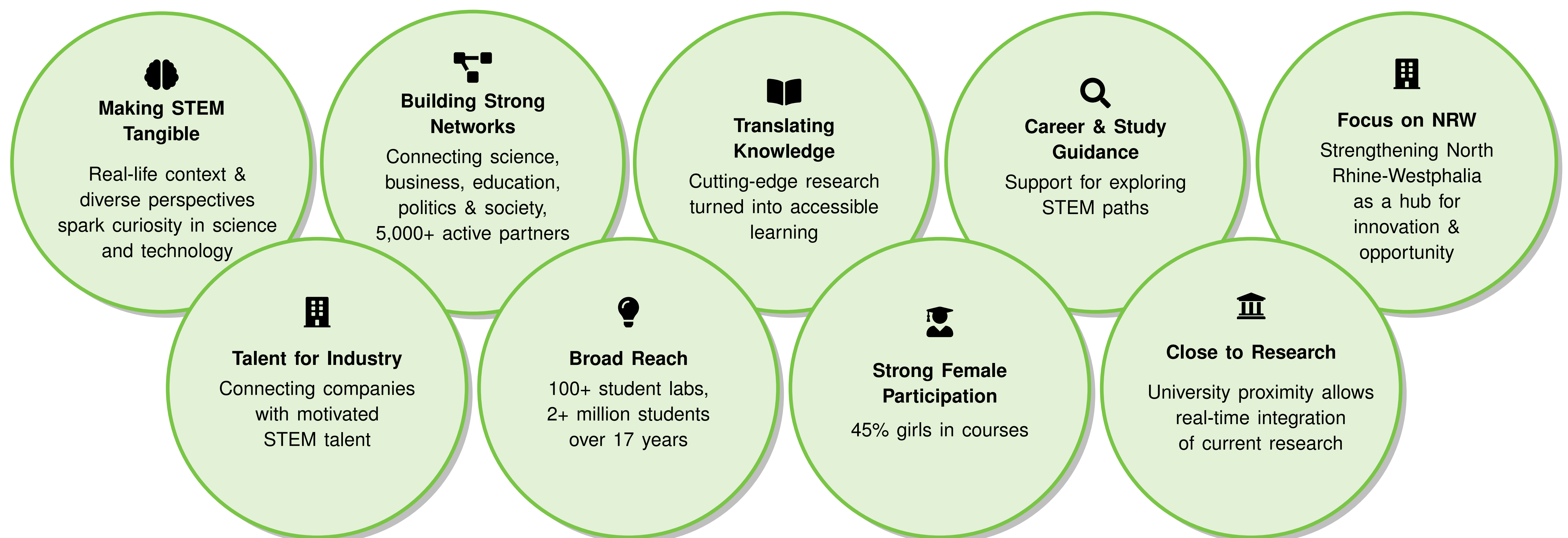


Sarah-Lena Debus, Jessica Malerczyk, Lech Kolonko, Giuseppina Lauricella-Giglia, Daniya Belkheir, Ibrahim Cekici, Kolja Thomas, Jörg Velten, and Anton Kummert







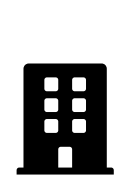

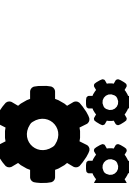
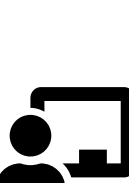
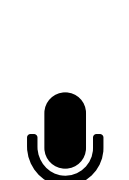
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# Empowering the Future Workforce: Enhancing Student Participation and Securing Skilled Professionals through Extracurricular STEM Courses

## Empowering the Entire Educational Journey with Compelling STEM Opportunities



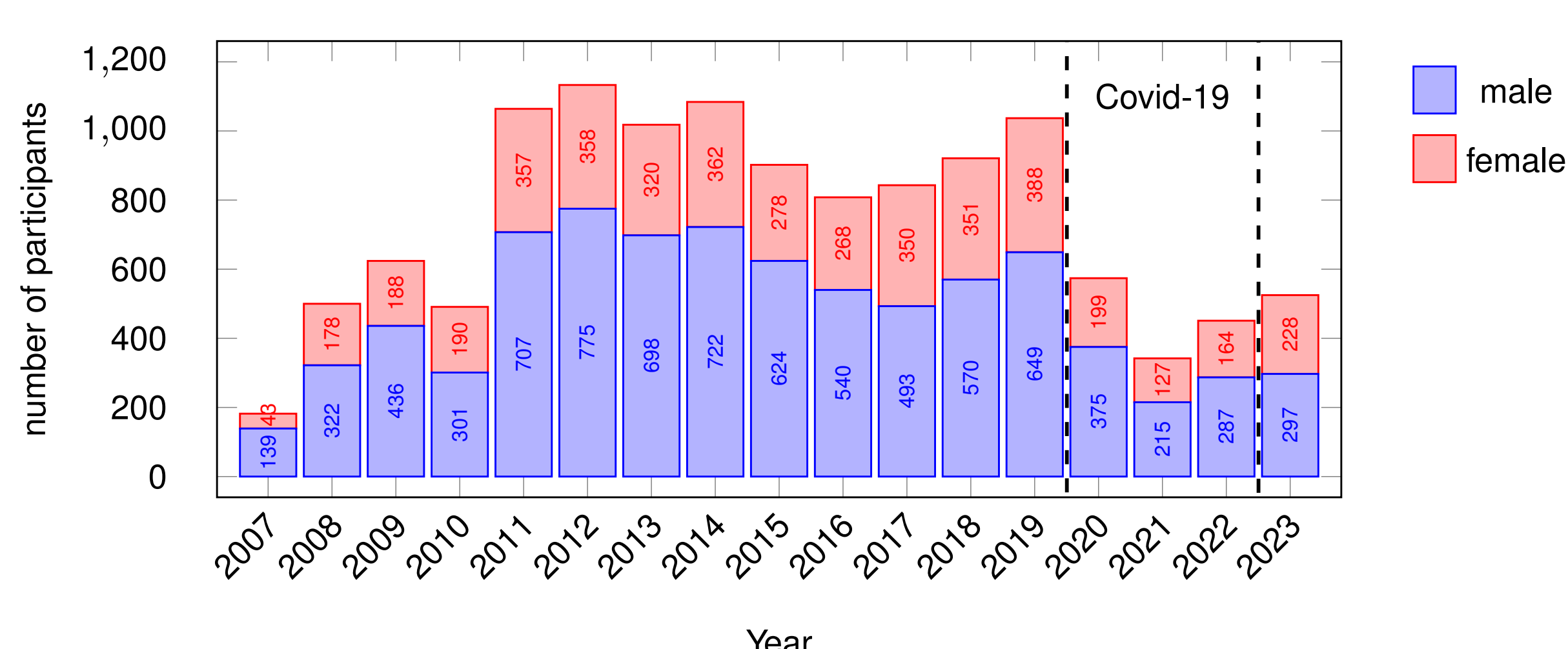
## Our Local Initiative: *zdi-Zentrum BeST* (Center for STEM education)

	<b>17 Years of Growth</b>	Active since 2007, with steady increase in participant and course numbers.
	<b>13,000+ Participants</b>	Between 2007 and 2023, more than 13,000 students have taken part in our local courses.
	<b>35% Female Participation</b>	The local average female participation rate stands at 35%.
	<b>Strong Regional Ties</b>	Close collaboration with the local economy enhances course relevance and attractiveness.
	<b>Motivated Learners</b>	Students voluntarily engage in extracurricular STEM activities during their free time.
	<b>Comprehensive Organization</b>	We manage all logistics — planning, promotion, school visits, and event coordination.
	<b>Company Involvement</b>	Companies define framework conditions such as timing, location, and age group.
	<b>School Recognition</b>	Courses are treated as official school events, ensuring student insurance coverage.
	<b>Hands-On Learning</b>	Students take on realistic assignments as “junior entrepreneurs” under real conditions.
	<b>Industry Mentors</b>	Company trainees and managers guide students to work independently and creatively.
	<b>Public Showcases</b>	Courses conclude with student presentations and product demos — often covered by the local press.

## Proposed Course Cycle Overview

- **Planning Phase (Pre-Semester)**
  - Analyze current trends and interests among students.
  - Select engaging, creative, and feasible course topics.
  - Design course concepts lasting 6–20 hours based on topic and group size.
  - *Examples:*
    - **Fidget Spinner:** CAD and machine manufacturing experience.
    - **Smart Table Lamp:** IoT project using ESP8266 and MicroPython.
- **Outreach and Promotion**
  - Create and distribute 50-page course flyers (5,000–6,000 copies per semester).
  - Share materials with 67 partner schools and youth-oriented institutions.
  - Conduct ~35 school visits per semester.
    - 45-minute presentations to grades 7–10.
    - Emphasis on accessibility and excitement, especially for non-STEM students.
- **Registration and Participation**
  - Centralized registration via website.
  - Course placements announced weeks before start.
  - Confirmation includes documents requiring parent/school signatures.
  - Participants receive personalized course certificates for job applications.
- **Course Formats**
  - (a) University-based courses (study orientation).
  - (b) Company-collaborative courses (career orientation & talent acquisition).
  - (c) Courses at central locations (e.g., vocational schools, tech labs, public institutions).

## Number of participants per year



## Example of Cooperative Courses with Industry

