

## Bielefeld International Conference on Applied Business (BiCAB)

**“Skills shortage - approaches and solutions from universities, companies and politics”**

17 May 2024

# WELCOME AND OPENING SPEECHES

**Prof. Dr. Riza Öztürk** (Dean, Bielefeld School of Business, HSBI)

**Prof. Dr. Natalie Bartholomäus** (Vice President Sustainability, People & Culture, HSBI)

**9:30-10:00 Uhr**



## (Strategic) HRM & Career@BI at HSBI

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BiCAB on “Skills shortage-approaches and solutions from universities, companies and politics”

## MANAGEMENT SUMMARY

- I **Skills shortage** also hits HSBI:  
HSBI takes responsibility to be attractive for potential and existing employees of all status groups
- I **Strategic HR work** is one of our pillars **designed to ensure long-term competitiveness**
- I **Strategic fields of action** mainly include **personnel recruitment** and **personnel retention**: recruiting new talent and retaining existing one is the primary goal of strategic human resource management at HSBI
- I **In this context, HR practices** are conceptually anchored and aligned with the following characteristics based on evidence:
  - **Systematic**
  - **Competency-based**
  - **Target-group-specific**
  - **International**
- I **New practices** are first **piloted**, then **evaluated** and **consolidated**

## EMPLOYER BRANDING

- I Development of a model to make professorship at HSBI more attractive**
- I Job advertisements, benefit catalogue**
- I HSBI career page**
- I Application for the German Employer Award for Education 2023**

## MODEL TO MAKE PROFESSORSHIP AT A UNIVERSITY OF APPLIED SCIENCES MORE ATTRACTIVE



Source: Armutat 2023

### Publications:

- Article “Berufsperspektive HAW-Professur – Attraktivitätsfaktoren für die Berufswahl” in Die Neue Hochschule 5|2022
- White paper: Berufsperspektive HAW-Professur: Attraktivitätsfaktoren und Befragungsergebnisse

### Transfer to, e.g.:

- Candidate personas
- Benefit catalogues specific to occupations
- Structure and content of job advertisements
- Central career website

## HSBI CAREER PAGE

HSBI Hochschule Bielefeld University of Applied Sciences and Arts

Hochschule Studium Forschung und Transfer Weiterbildung Internationales Karriere an der HSBI

HSBI / Karriere an der HSBI / Karriere in der Wissenschaft / Karriere als HAW-Professor\*in

**Karriere als Professor\*in an der HSBI**

Sie möchten sich auf eine Professur an der Hochschule Bielefeld (HSBI) bewerben? Oder sich darüber informieren, ob dieser Karriereweg für Sie passend sein könnte? Wir freuen uns über Ihr Interesse! Deshalb haben wir viele hilfreiche Informationen rund um den Beruf HAW-Professor\*in, den Weg dorthin und die besonderen Angebote und Benefits für Professor\*innen an der HSBI zusammengestellt.

**Warum Professor\*in an der Hochschule Bielefeld werden?**

Wir leben Vielfalt. In der Forschung, im Austausch miteinander, mit Studierenden und mit Akteur\*innen aus der Praxis. An unseren drei Standorten Bielefeld, Gütersloh und Minden leben und lernen wir miteinander. Als Professor\*in an der HSBI profitieren Sie von einem forschungsintensiven, vernetzten Umfeld in einer wirtschaftsstarken Region. Wir möchten, dass Sie sich an unserer Hochschule wohlfühlen. Deshalb bieten wir Ihnen viele zusätzliche Angebote und Leistungen.

Informieren Sie sich jetzt über den **Berufsweg HAW-Professor\*in** und Ihre vielfältigen Perspektiven an der Hochschule Bielefeld!

- [Das sind die Aufgaben von HAW-Professor\\*innen](#)
- [Wie werde ich HAW-Professor\\*in? Fragen und Antworten](#)
- [Aktuelle Stellenangebote](#)
- [So läuft das Bewerbungsverfahren ab](#)
- [Angebote und Benefits für Professor\\*innen an der HSBI](#)
- [Berufsweg HAW-Professor\\*in: das Projekt Career@BI](#)

**Studierende begleiten, neue Sichtweisen entwickeln und immer neugierig bleiben: Professor\*innen der HSBI erläutern, was sie an ihrem Job mögen und was ihre tägliche Arbeit ausmacht.**

- Structured by target groups
- Attractiveness-oriented
- User-friendly
- Transparent
- Video-backed

HSBI Hochschule Bielefeld University of Applied Sciences and Arts

Hochschule Studium Forschung und Transfer Weiterbildung Internationales Karriere an der HSBI

HSBI / Karriere an der HSBI

**Aktuelle Stellenangebote**

**Ihre Vorteile an der HSBI**

**Ausbildung an der HSBI**

**Karriere in der Wissenschaft**

**Karriere als HAW-Professor\*in**

**Karriere in Technik und Verwaltung**

**Ihre Bewerbung an der HSBI**

**Häufige Fragen zur Karriere an der HSBI**

**Zahlen, Daten und Fakten zur HSBI**

## RELAUNCH OF ADS

- Tailored to target groups and locations
- Based on benefit catalogue for occupations
- Workshops with faculties and departments
- Pilot with external service provider for graphic design
- Consolidation within the organisation starting in April 2024



Hochschule  
Bielefeld  
University of  
Applied Sciences  
and Arts

**Campus Bielefeld**  
Mitarbeiter\*in in Technik und  
Verwaltung  
Vollzeit, ab sofort  
unbefristet  
bis E12 TV-L



Die Hochschule Bielefeld (HSBI) mit ihren über 10.000 Studierenden steht für höchste Standards in Lehre, Forschung und Wissenstransfer. Die Fachbereiche Gestaltung, Campus Minden, Ingenieurwissenschaften und Mathematik, Sozialwesen, Wirtschaft und Gesundheit arbeiten interdisziplinär, forschungsbasiert und eng vernetzt. Regionale und internationale Kooperationen sowie gelebte Vielfalt und Nachhaltigkeit prägen die Arbeit an den Standorten Bielefeld, Minden und Gütersloh.

Das Dezernat Gebäudemanagement der Hochschulverwaltung besetzt unbefristet eine Position als

### Elektroingenieur\*in (m/w/d) im technischen Gebäudemanagement

**IHRE AUFGABEN**

- Energiecontrolling und Betriebsoptimierung (energetisch) von gebäudetechnischen Anlagen
- Aufgaben im Gebäudemanagement zur Erhaltung und Verbesserung der Funktionen der Gebäude und elektrotechnischen Anlagen, unter Berücksichtigung zukunftsorientierter Techniken, Wirtschaftlichkeit & Nachhaltigkeit
- Umsetzung von Wartungs- und Prüfvorgaben aller gebäudetechnischen überwachungsbedürftigen Anlagen

**IHR PROFIL**

- Erfolgreich abgeschlossenes Hochschulstudium im Bereich Ingenieurwesen der Fachrichtung Energie- oder Elektrotechnik bzw. verwandter Studiengang; alternativ erfolgreich abgeschlossener staatl. geprüfter Techniker
- Sehr gute Kenntnisse/Fähigkeiten im Umgang mit MS Office
- Gute konzeptionelle und organisatorische Fähigkeiten
- Strukturierte, selbstständige, lösungsorientierte Arbeitsweise
- Gute Kommunikations- und Teamfähigkeit, Flexibilität und ausgeprägtes Servicedenken, Lernbereitschaft
- VOB- und HOAI-Kenntnisse

- Begleitung von Bauleistungen nach VOB (z.B. bei Sanierungen, Instandsetzungen, Neubau- & Umbaumaßnahmen)
- Planungsleistungen nach HOAI
- Projektleitungen
- Beauftragung und Koordinierung von Unternehmern
- Technische Prüfung von revidierten technischen Dokumentationen
- CAFM-basierende Dokumentationspflege

**WIR WÜNSCHEN UNS**

- Eine\*n Kolleg\*in mit Spaß an der Arbeit und an neuen Herausforderungen
- Kenntnisse im Umgang mit CAFM- und CAD-Software
- Kenntnisse im Bereich Facility- und Gebäudemanagement
- Pkw-Führerschein

<https://www.hsbi.de/karriere/stellenangebote>





*Act 2 Sustain*

Das Nachhaltigkeitsprogramm  
der Hochschule Bielefeld

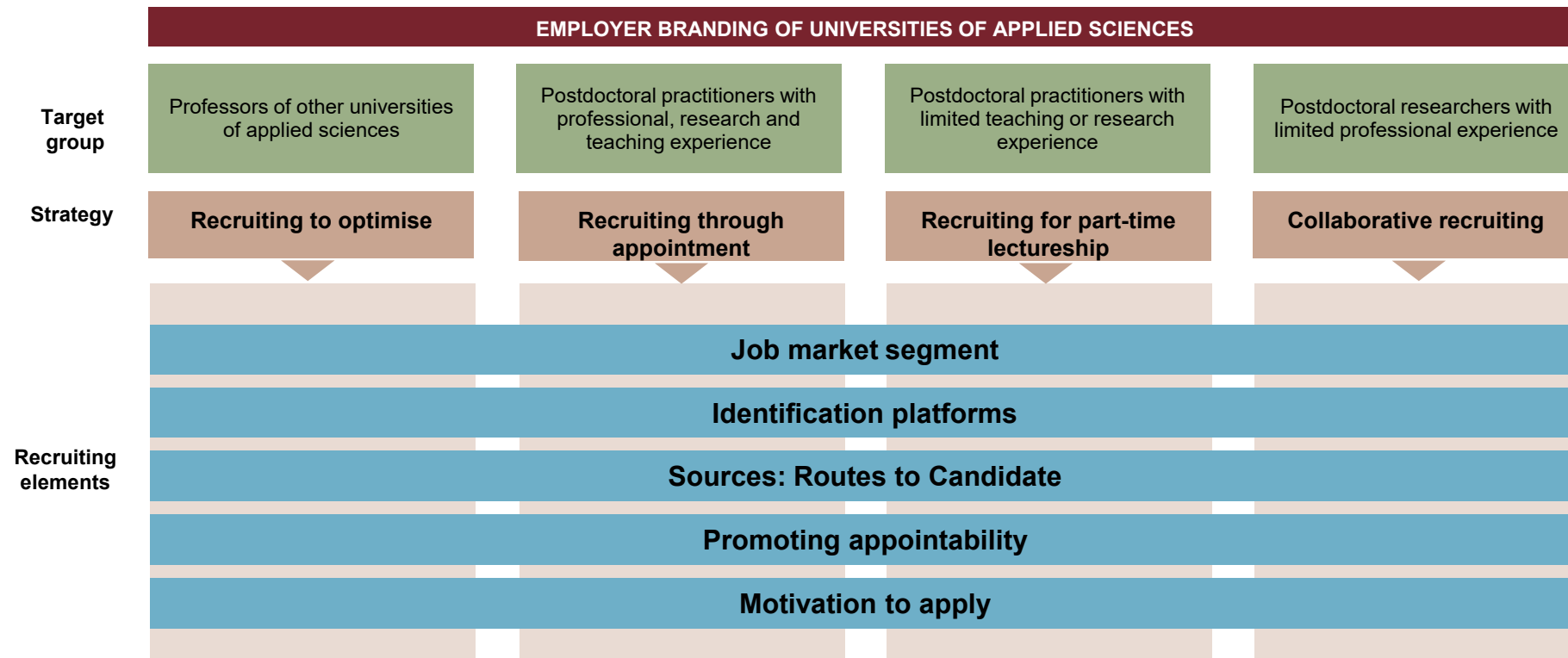


## RECRUITMENT, DEVELOPMENT AND RETENTION

- I New recruiting strategies**
- I Intercultural skills development programme for administration**
- I Time2Talk and Break2Grow as new HR tools**
- I HSBI-specific competency model**
- I Developing career paths**
- I Career@BI – HSBI's large development programme**

## RECRUITING STRATEGIES AS STARTING POINT

Recruiting strategies are bundles of measures tailored to target groups to efficiently and effectively recruit candidates.



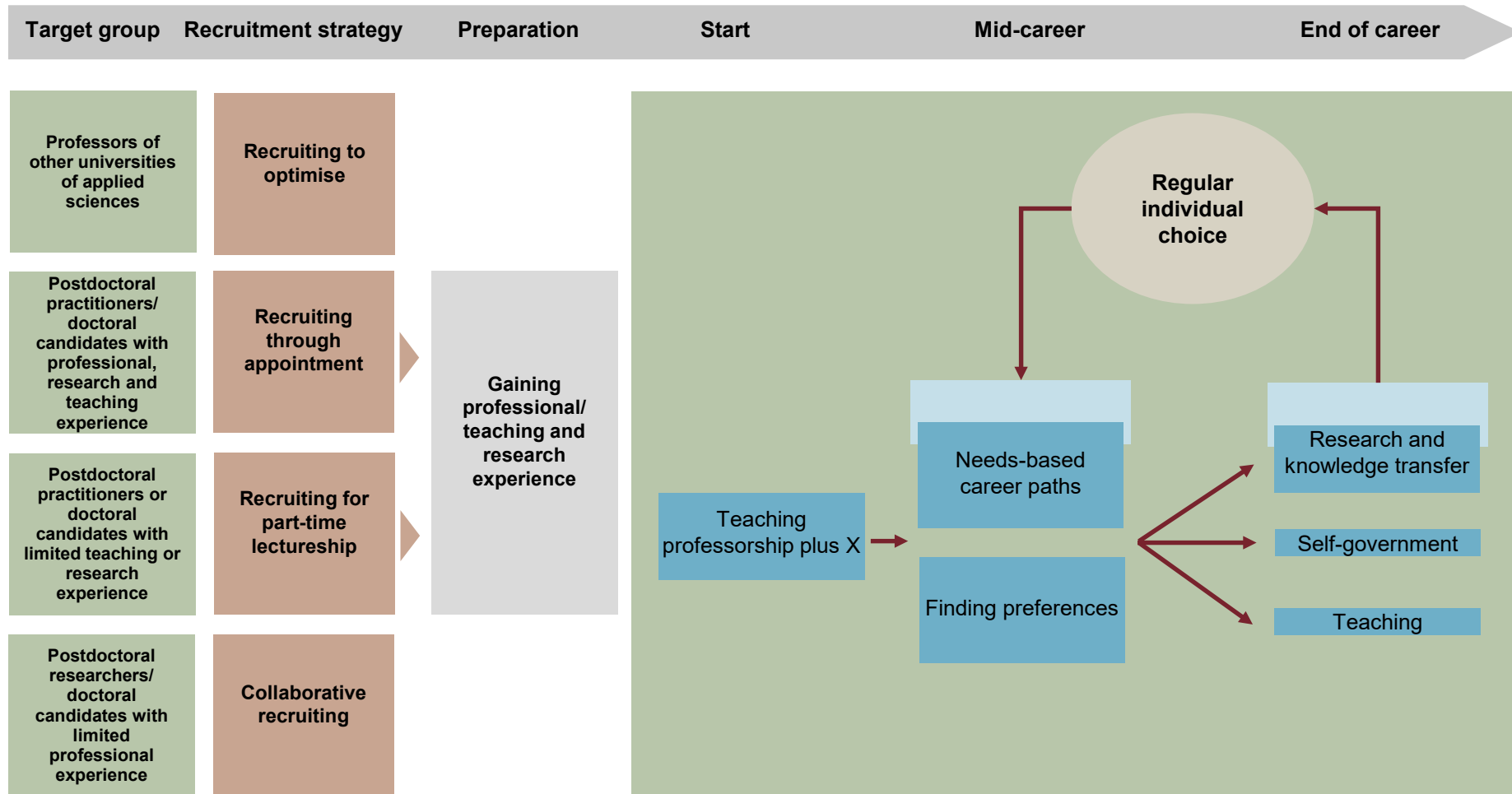
Source: Armutat 2024

## PERSONNEL MANAGEMENT/RETENTION

- New HR tools:
  - Time2Talk (systematic feedback and reflection discussions)
  - Break2Grow (sabbaticals)

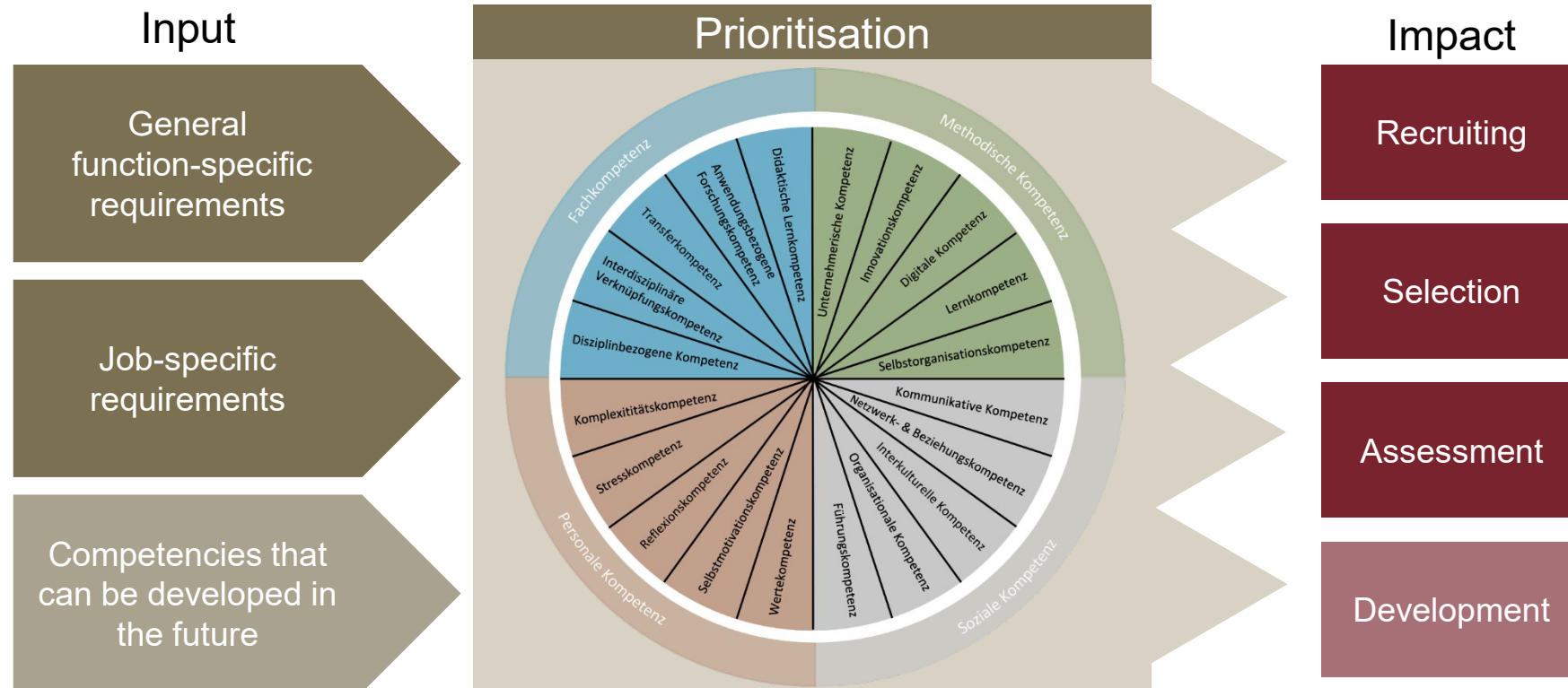


## RECRUITMENT STRATEGIES & CAREER PATHS



Source: Armutat 2023

## COMPETENCY MODEL PROFESSORSHIP AT A UNIVERSITY OF APPLIED SCIENCES



## Project Presentation Career@BI

29.05.2024

## KEY DATA

- | Funded by the joint federal and *Länder* programme “FH Personal”
- | Project volume: €9.2m
- | Project duration: October 2021–March 2027
- | Embedded in the CareTech OWL research network
- | Filling 55 qualification positions over the entire project duration





## TYPES OF POSITIONS OFFERED AS PART OF THE PROGRAMME

### Tandem position

- 50% at HSBI with a teaching load of 4–6 weekly hours per semester
- 50% at a cooperating partner company to work on a joint research project
- Gaining experience in industry, teaching, tasks in research management and self-government

### Part-time lectureship

- 25–50% for HSBI with a teaching load of 2–4 weekly hours per semester
- Current employment can be continued
- Teaching, tasks in research management and self-government

## COOPERATION PARTNERS INCLUDE

- | v. Bodelschwingsche Stiftungen (Bethel)
  - | Stadtwerke Bielefeld
  - | AWO Bielefeld
  - | AWO Münsterland-Recklinghausen
  - | Weisse Liste
  - | City of Bielefeld
  - | REGE
  - | Melitta
  - | neuroConn GmbH
  - | Franziskus Hospital
  - | Klinikum Bielefeld
  - | Interargem GmbH
  - | Exa Computing GmbH
  - | LaVision BioTec GmbH
  - | Evangelisches Klinikum Bethel
  - | City of Bad Salzuflen
  - | SNAP GmbH
-

## HR MEETS SKILLS SHORTAGE

- | Systematic
- | Competency-based
- | Target-group-specific
- | International
- | **Collaboration- and innovation-oriented**



— Thank you for your attention!

# KEYNOTE SPEECH

**Eike Krull, Wilhelm Böllhoff GmbH & Co. KG**

**10:00-10:20 Uhr**



# **Skills shortage - approaches and solutions from universities, companies and politics**

**Eike Krull**

**Head of Corporate Human Resources  
Böllhoff Group**

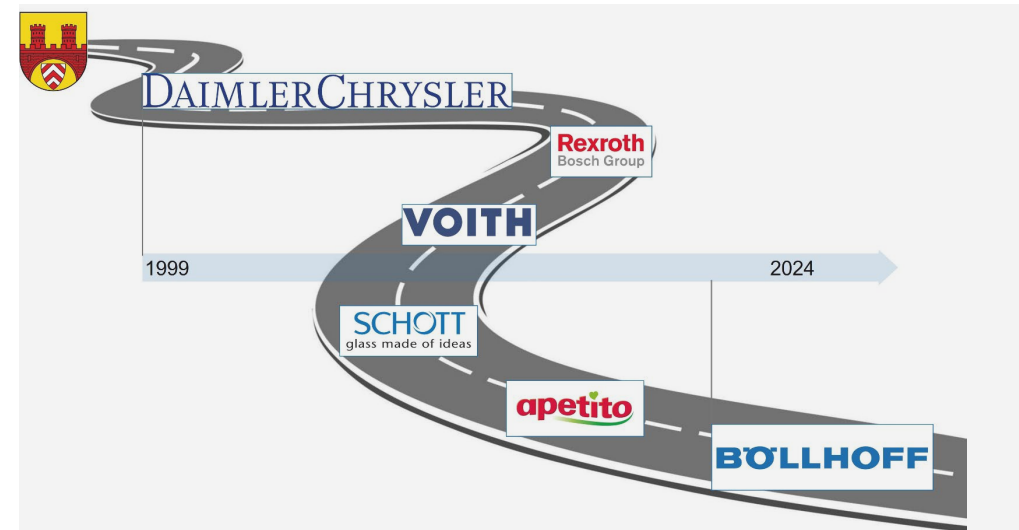
**May 17th, 2024**

## That's Böllhoff:



- Family-owned business in 4<sup>th</sup> generation
- 43 locations / 3.400 employees
- 25 countries
- 5 continents
- 13 production locations
- 18 million fasteners manufactured per day
- 809 € million annual turnover

## That's Eike:



- Head of Corporate Human Resources
- 11 locations
- 3 countries
- 3 continents
- 10 production locations
- Providing “fasteners” for people
- No millions as income

**IT'S ALL ABOUT PEOPLE**

**BÖLLHOFF**

**BÖLLHOFF**

**100 Jahre  
Böllhoff in  
Bielefeld**

**Ohne Euch kein Wir, ohne Euch kein Hier.**

Without you no us, without you no here.





\*Volkswagen National Campaign by KSP

# JOB MARKET

# BÖLLHOFF



**FROM**



**TO**

# CHANGING TECHNOLOGY

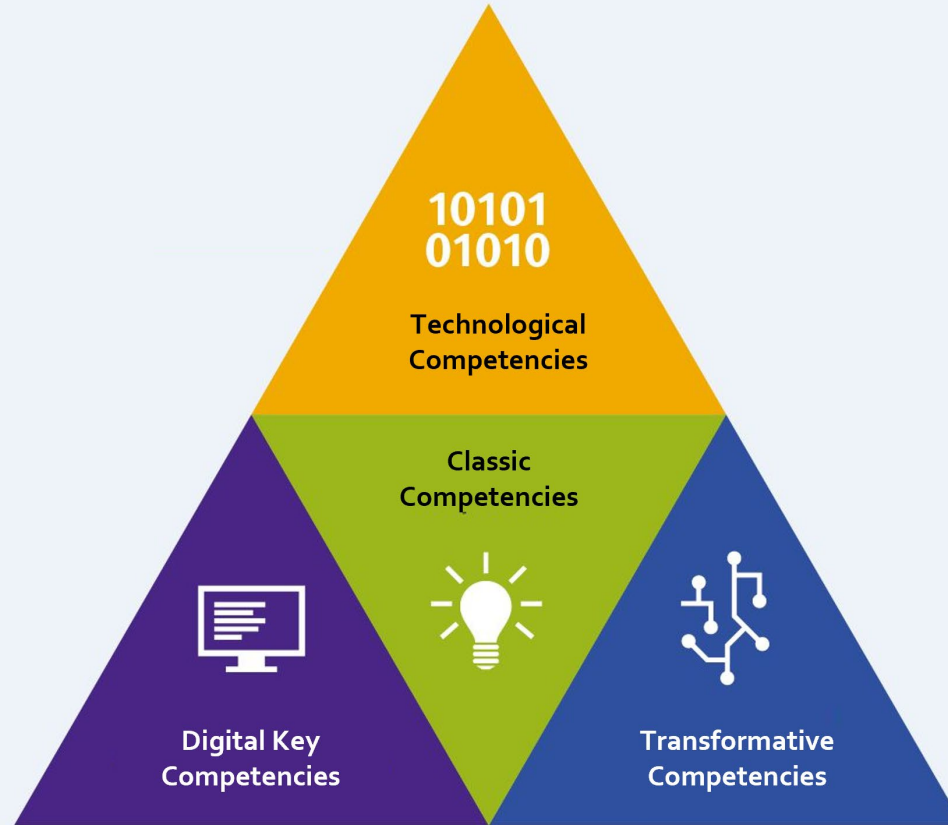
**BÖLLHOFF**



**FROM**

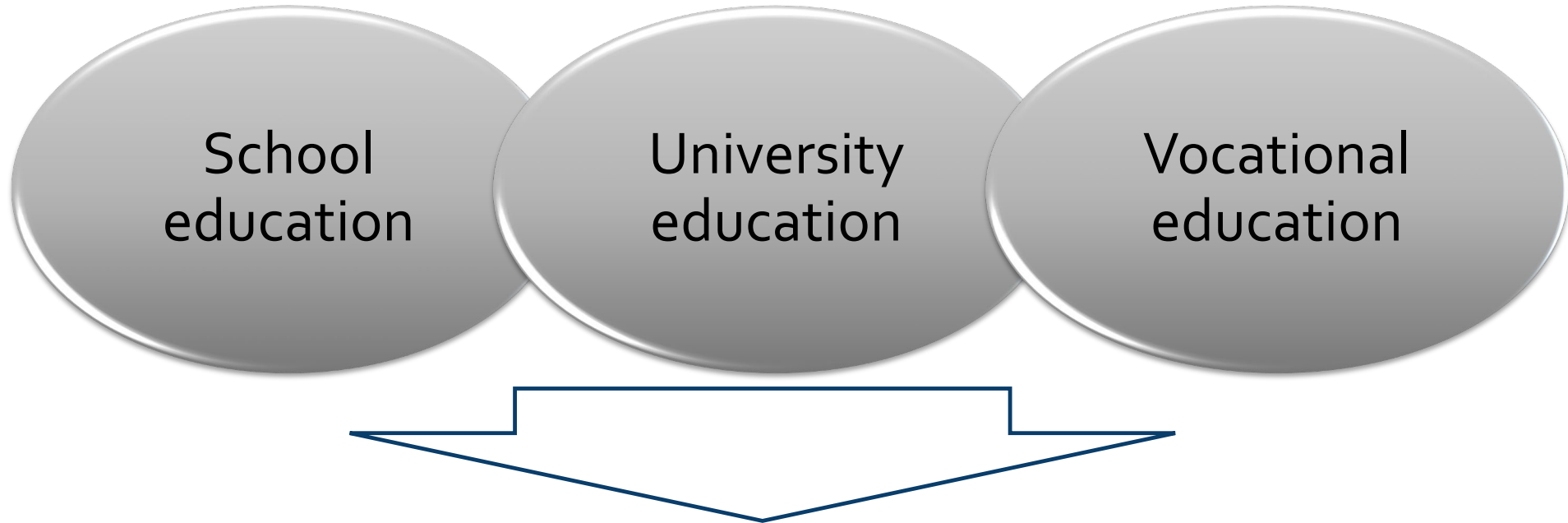


**TO**



# EMPOWER FUTURE SKILLS THROUGH COLLABORATIVE EDUCATION

**BOLLHOFF**



- Mutual support in creating educational opportunities for future skills
- Human – Technology – Digital interaction opportunities
- Less formal boundaries and bureaucracy

# OUR INVESTMENT IN FUTURE SKILLS – EDUCATION CAMPUS



Designed as a central place for learning, innovation and collaboration in times of digitalization, transformation and automation.



# EDUCATION CAMPUS – IMPRESSIONS



- Digital Transformation
- Practical Learning with AI
- Robotics
- Collaboration Space



- Up- and Reskilling
- Training/dual study programmes
- Partnering with schools, universities, companies

# PUT FOCUS ON EMPOWERING PEOPLE!

**BÖLLHOFF**

An advertisement for Böllhoff featuring four employees (two men and two women) standing together. The text reads: "Ohne Euch kein Wir, ohne Euch kein Hier." and "Without you no us, without you no here." Below the image is a triangle diagram representing competencies. The top vertex is yellow and labeled "10101 01010 Technological Competencies". The bottom-left vertex is purple and labeled "Digital Key Competencies". The bottom-right vertex is blue and labeled "Transformative Competencies". The center of the triangle is green and labeled "Classic Competencies". A blue arrow points from the text "EMPOWER for Future Skills" to the triangle diagram.

**BÖLLHOFF**

100 Jahre Böllhoff in Bielefeld

**Ohne Euch kein Wir, ohne Euch kein Hier.**  
Without you no us, without you no here.

**EMPOWER**  
for  
Future Skills

10101  
01010  
Technological  
Competencies

Classic  
Competencies

Digital Key  
Competencies

Transformative  
Competencies

**FROM**



**TO**





**BOLLHOFF**

**THANK YOU FOR YOUR  
ATTENTION**



Passion for successful joining.

## KEYNOTE SPEECH

**Cancelled!!!**

**Henrich Hardieck**, Procorator WEGE (Economic Development Agency /City of Bielefeld)

**10:20-10:40 Uhr**

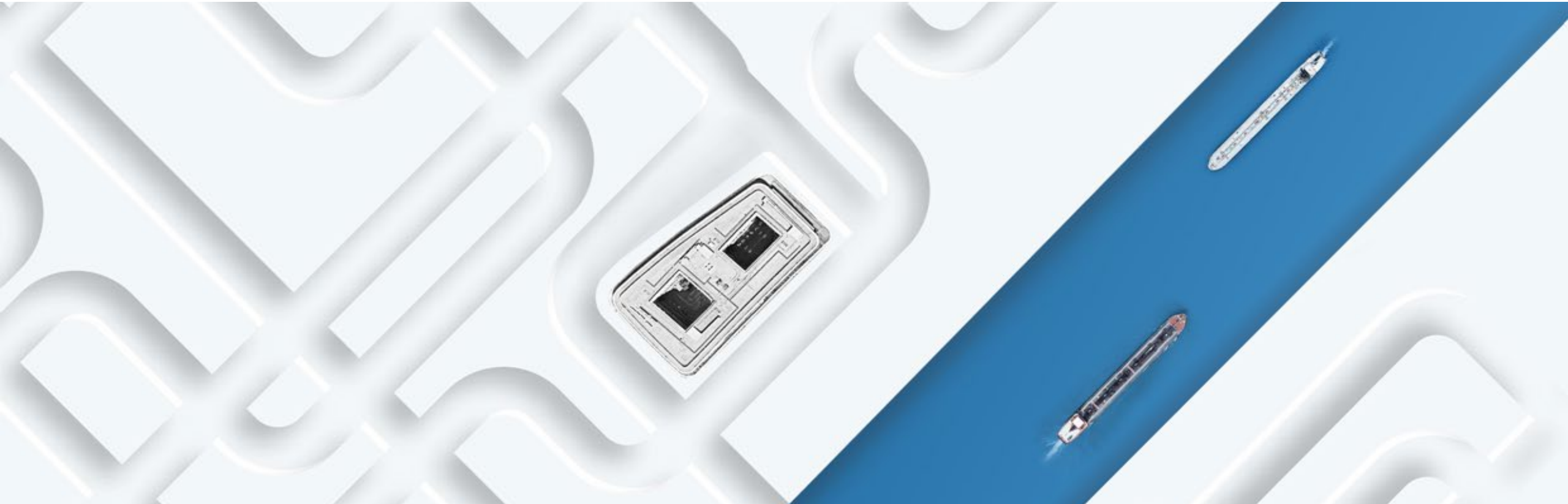
# KEYNOTE SPEECH

**Dr. Wido Geis-Thöne**, Senior Economist for Family Policy and Migration Issues  
(German Economic Institute)

**10:40-11:00 Uhr**



# Labor market potential of educating international students

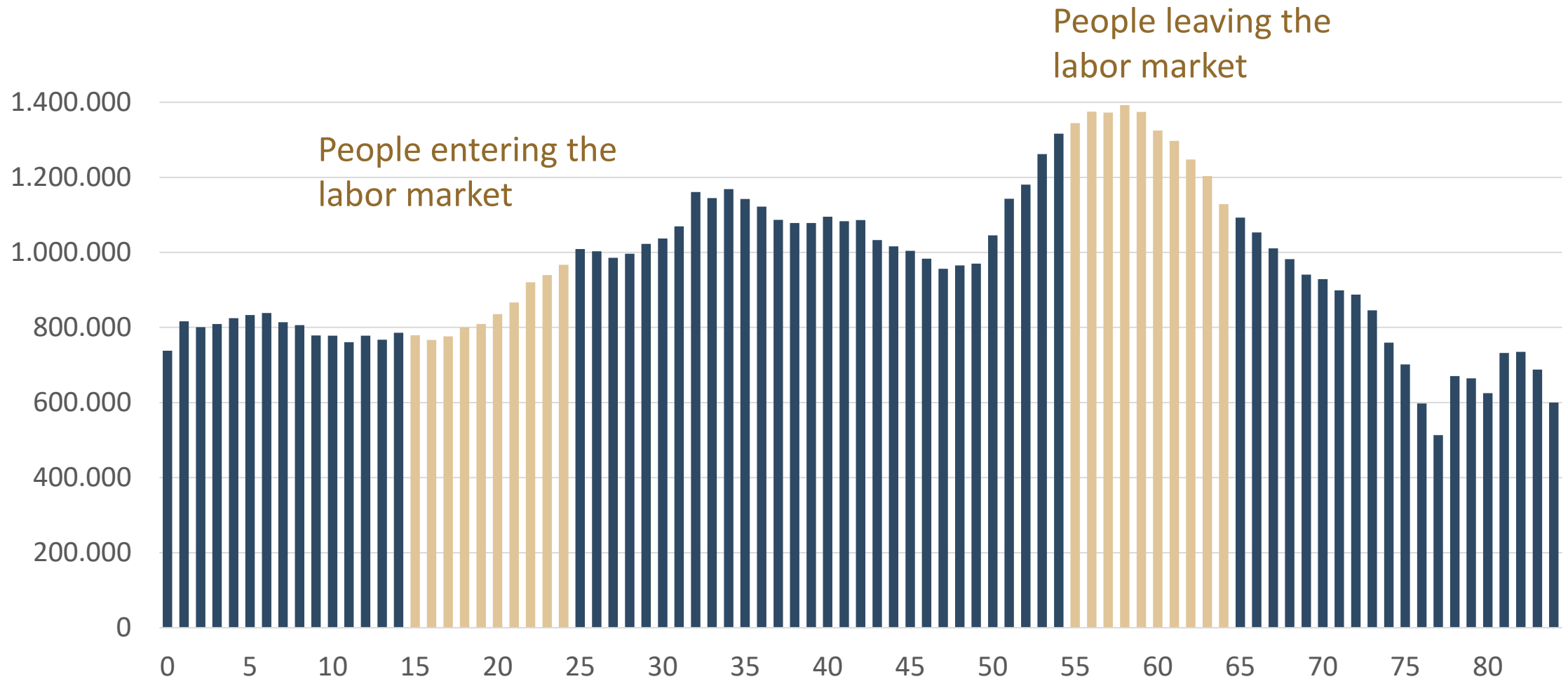


# Agenda

- 1 Background: Germany needs more skilled workers from abroad
- 2 The labor market integration of international students does work
- 3 More international students are coming to Germany, especially from India
- 4 Universities have the potential to educate even more international students
- 5 Conclusion: The education of international students must be further strengthened

# Huge demographic gaps make immigration necessary

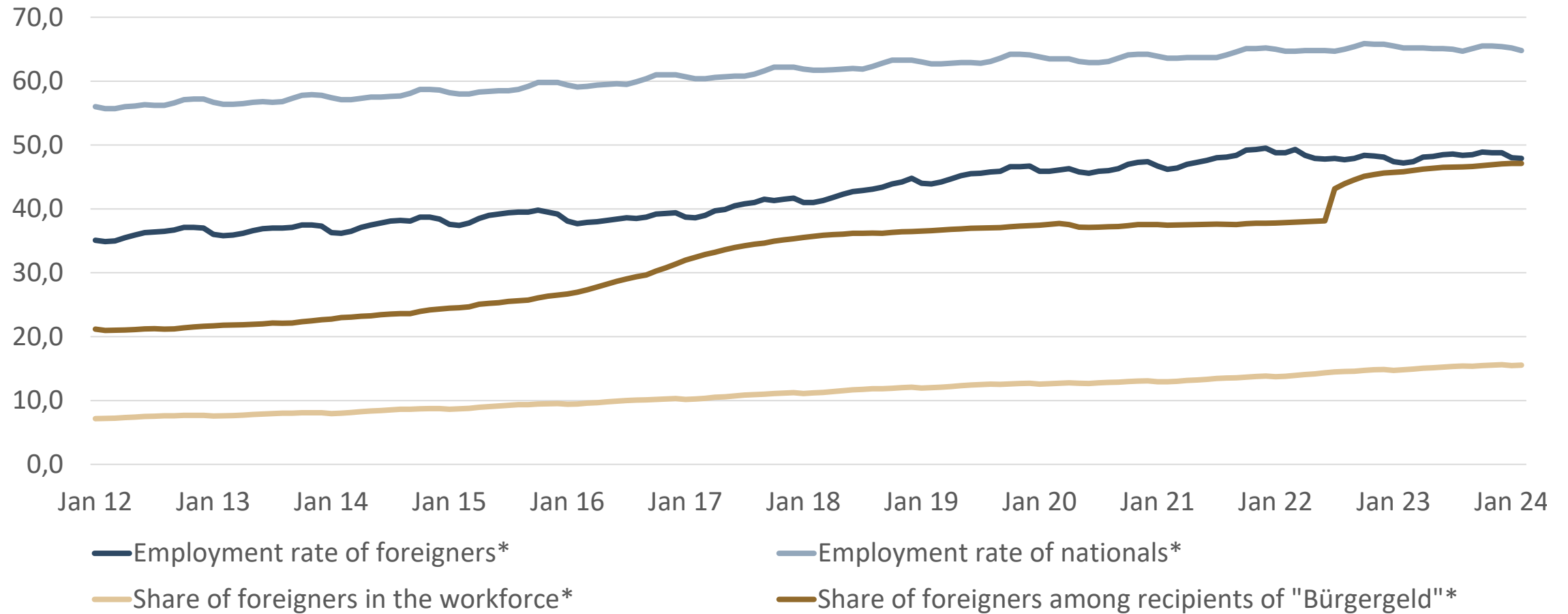
Age structure of the German population, as at 31.12.2022



Source: Statistisches Bundesamt, 2024

# Labor market integration has improved, but is still a challenge

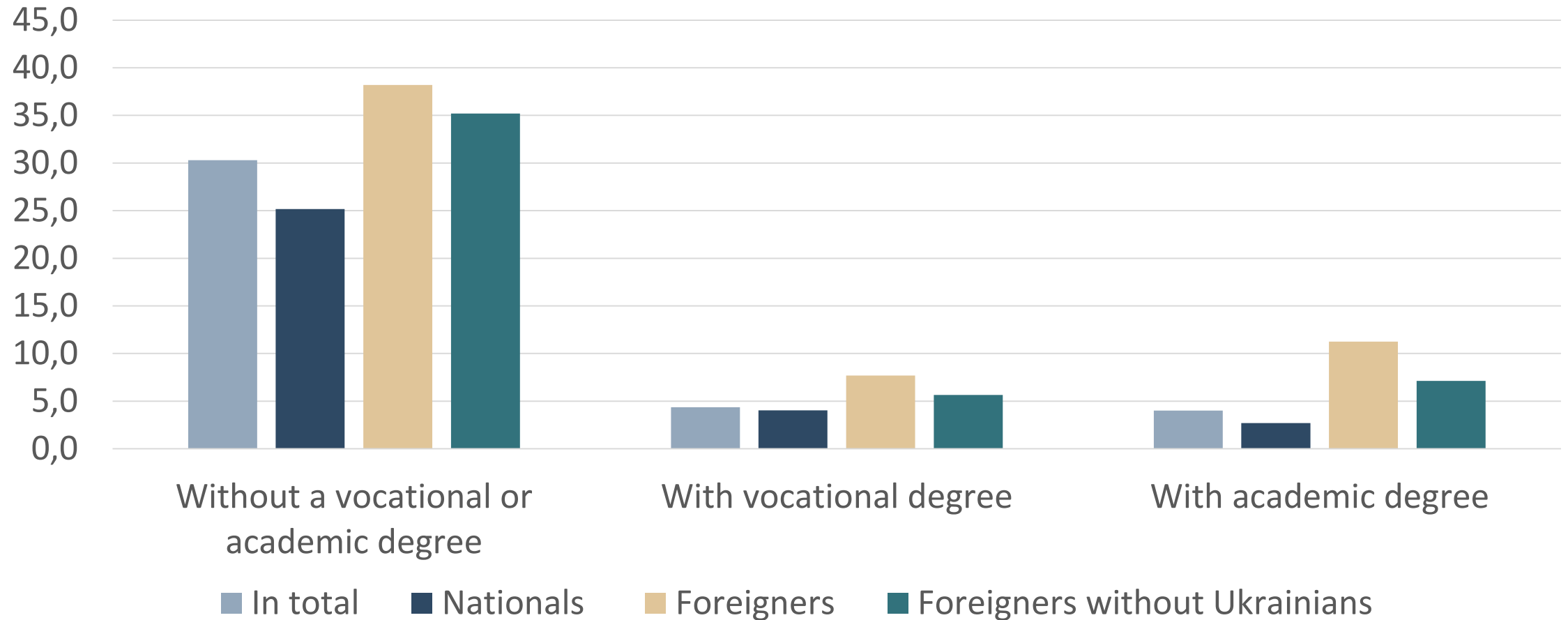
Employment rates and shares of foreigners in percent



\*\* subject to social security contributions \*\*of working age  
Source: Bundesagentur für Arbeit

# A low level of education is one problem, but not the only one

Simplified unemployment rates\* by nationality and education level in percent



\*\*Only considering employees subject to social security contributions and unemployed persons  
Source: Bundesagentur für Arbeit; own calculation



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Background: Germany needs more skilled workers from abroad

2

The labor market integration of international students does work

3

More international students are coming to Germany, especially from India

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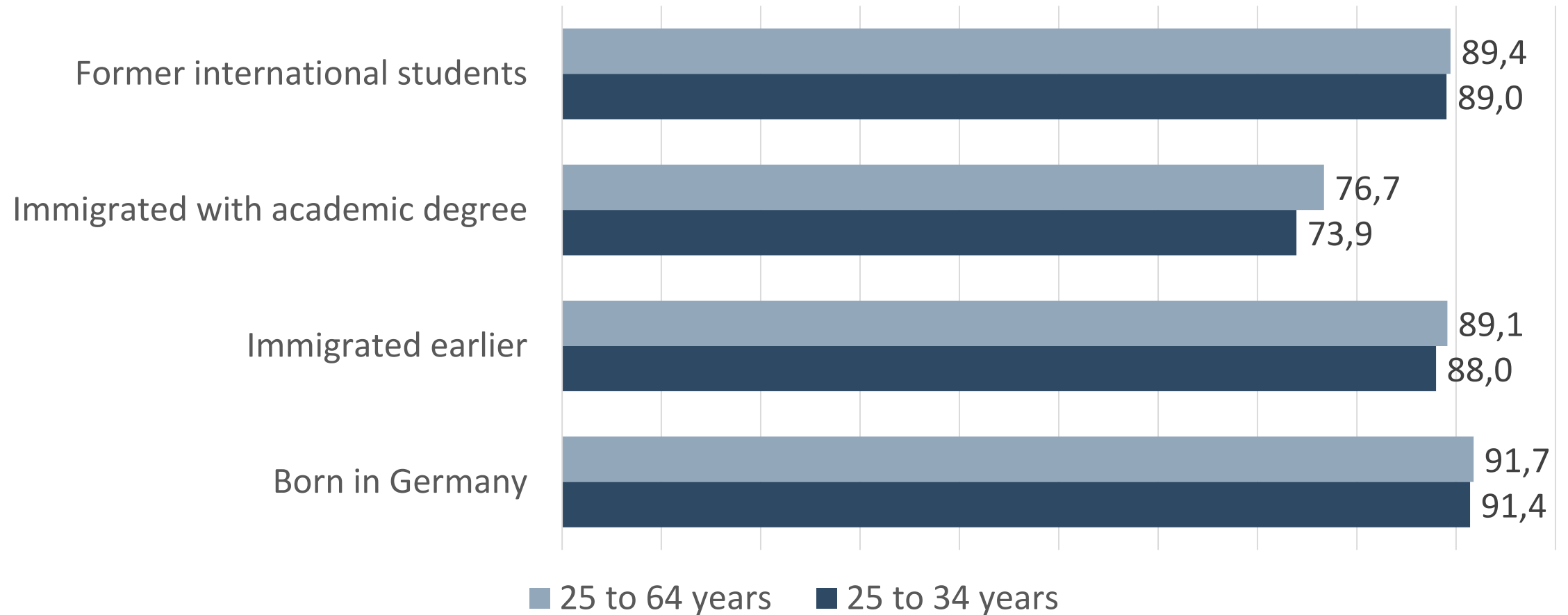
Universities have the potential to educate even more international students

5

Conclusion: The education of international students must be further strengthened

# Former international students are mostly employed

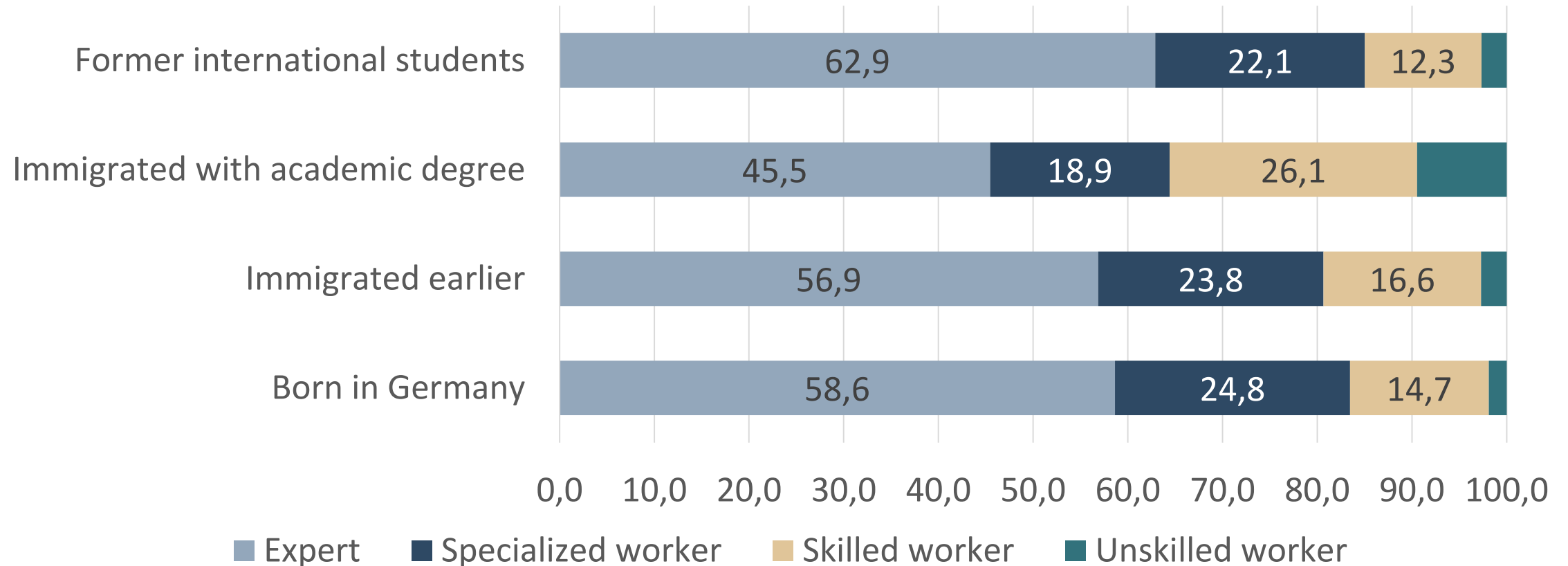
Employment rates of persons with academic degrees in the year 2019 in per cent



Source: Geis-Thöne, 2022

# And employment is mostly adequate to qualifications

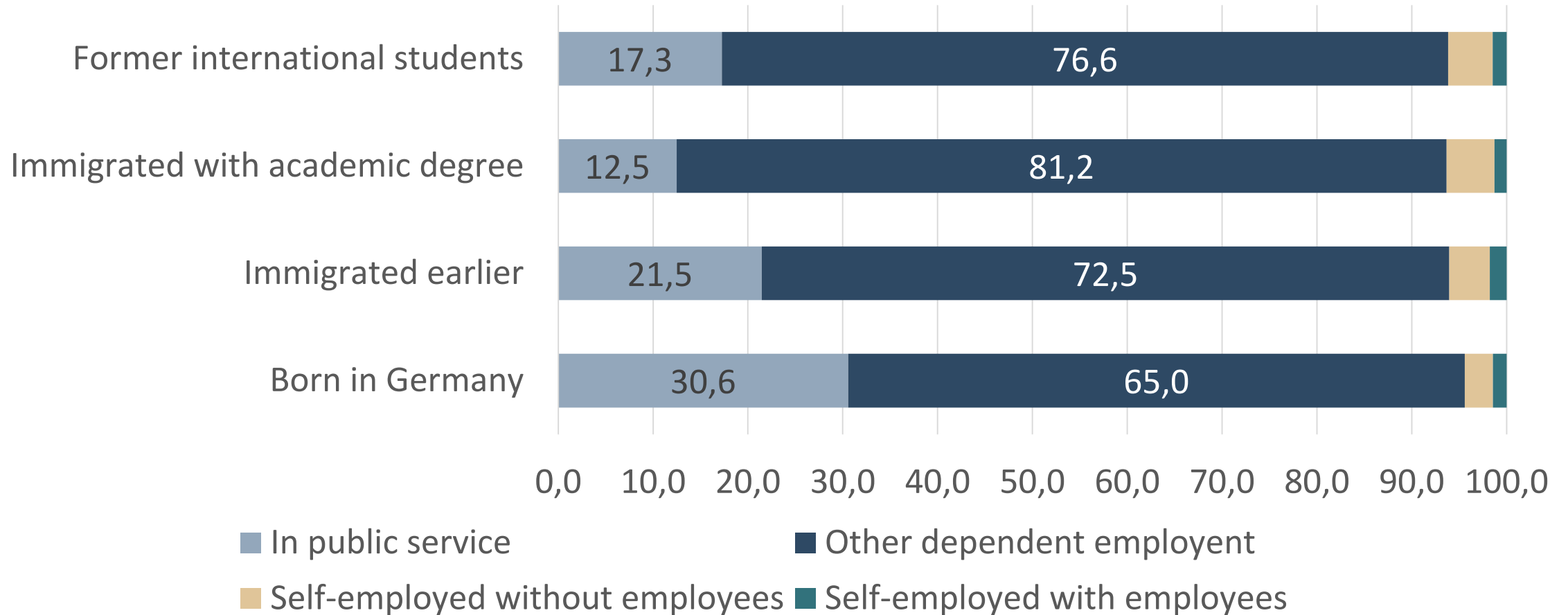
Required qualification levels of the jobs of employed persons between 25 and 34 years with academic degrees in the year 2019 in per cent



Source: Geis-Thöne, 2022

# However, they rarely work in the public service

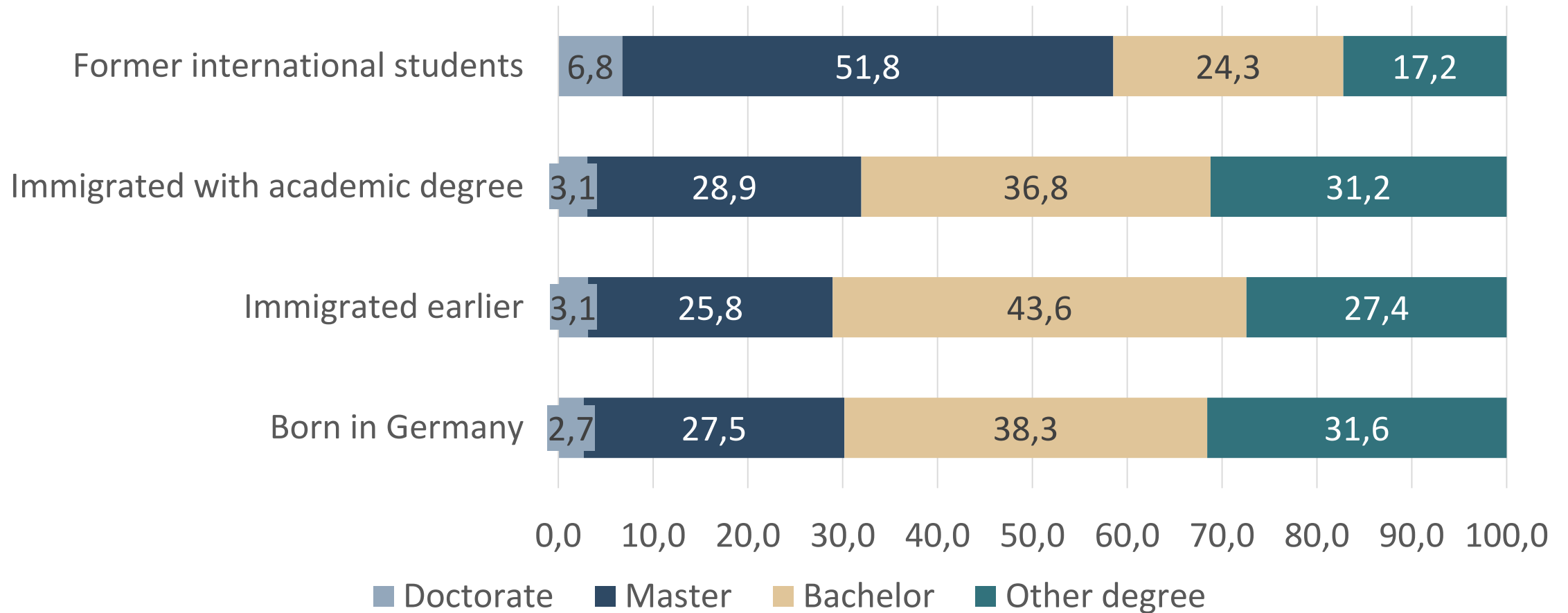
Types of the jobs of employed persons between 25 and 34 years with academic degrees in the year 2019 in per cent



Source: Geis-Thöne, 2022

# Former international students have higher degrees

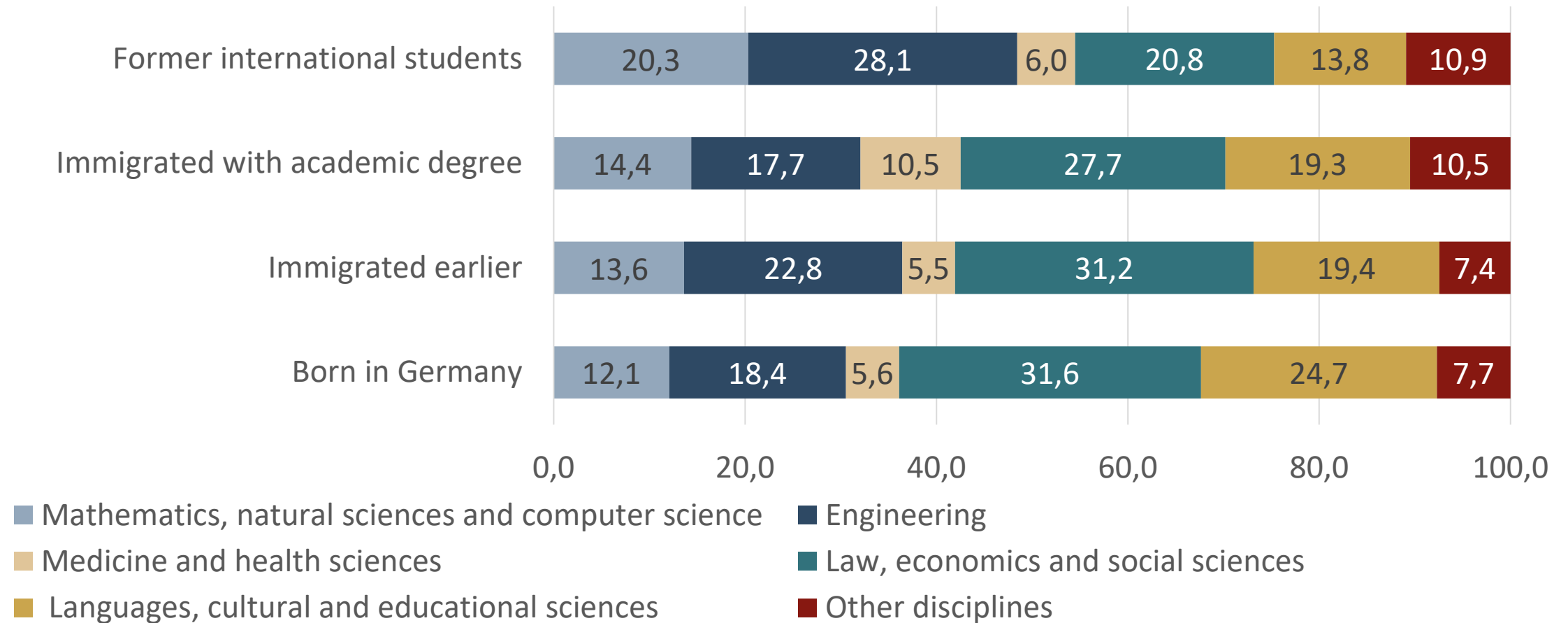
Concrete degrees of academically qualified persons between 25 and 34 years in the year 2019 in per cent



Source: Geis-Thöne, 2022

# And more often STEM-degrees

Fields of studies of academically qualified persons between 25 and 34 years in the year 2019 in per cent



Source: Geis-Thöne, 2022

# Agenda

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Background: Germany needs more skilled workers from abroad

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The labor market integration of international students does work

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More international students are coming to Germany, especially from India

4

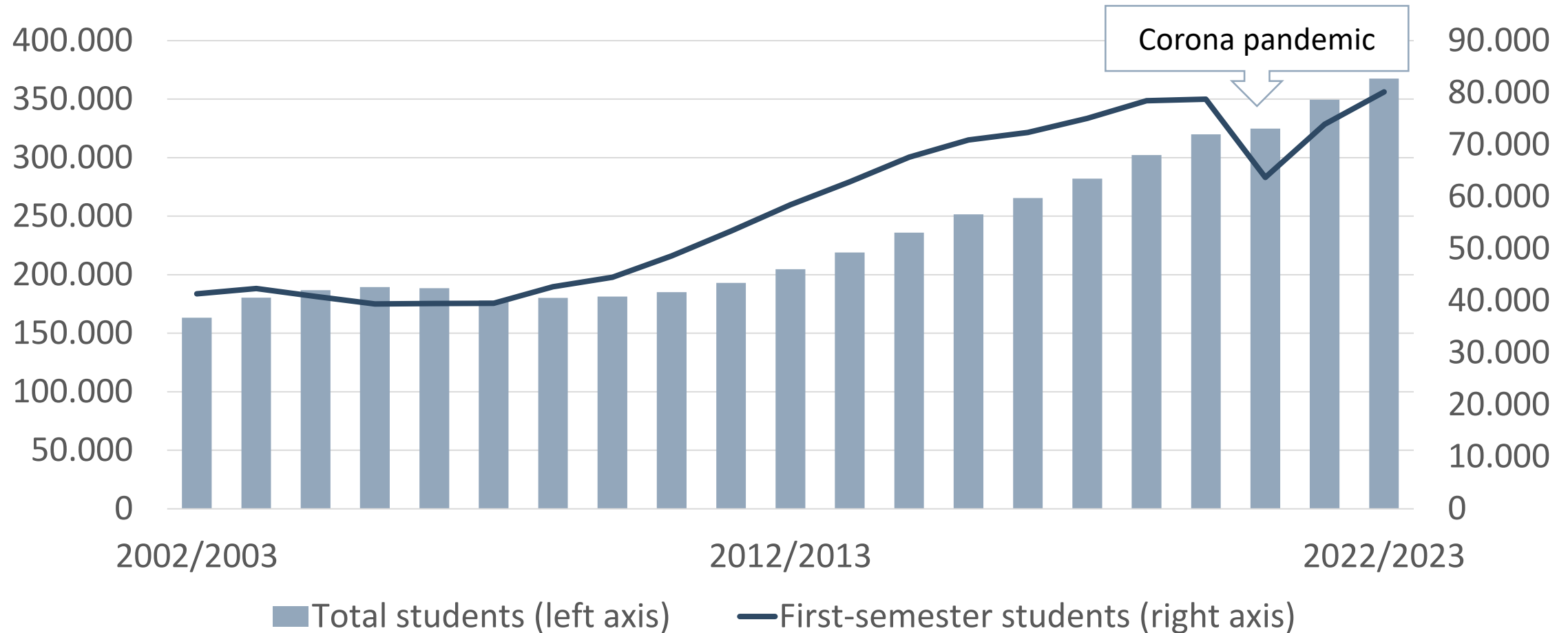
Universities have the potential to educate even more international students

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Conclusion: The education of international students must be further strengthened

# The number of international students in Germany is rising

Numbers in the respective winter semesters

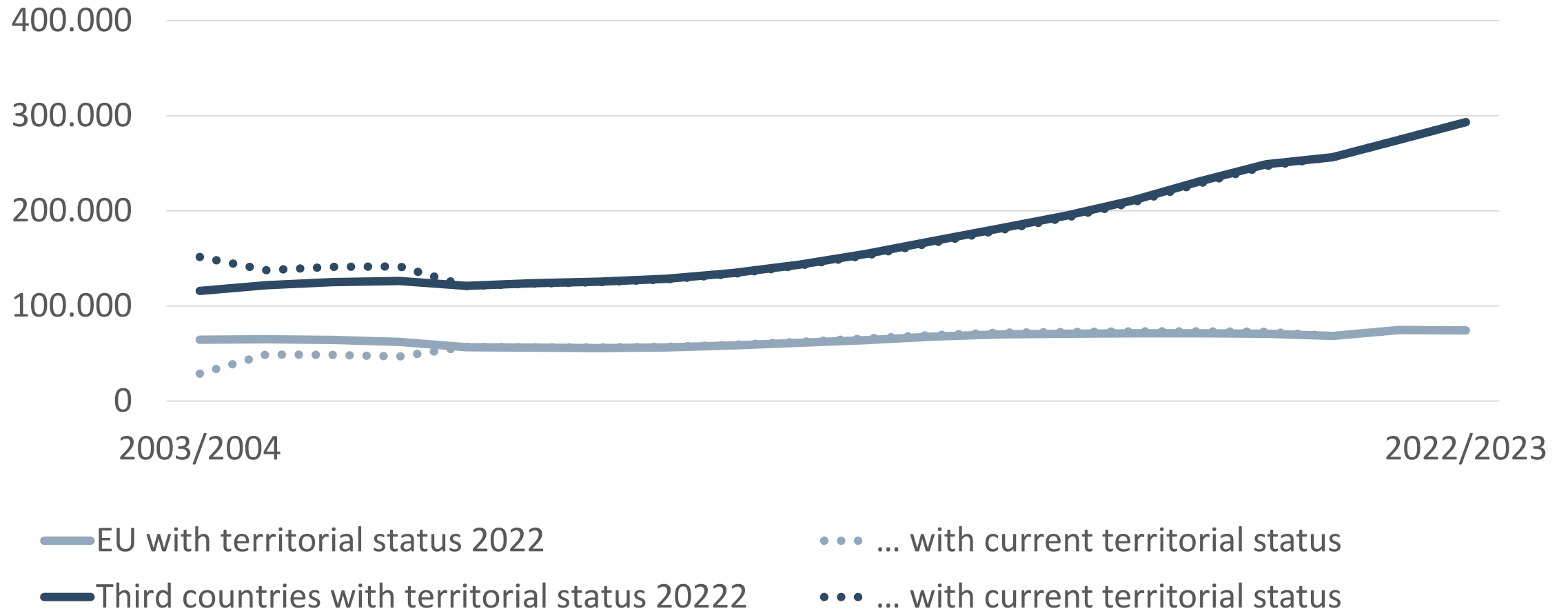


Source: Geis-Thöne. 2024



# Most of them coming from outside the EU

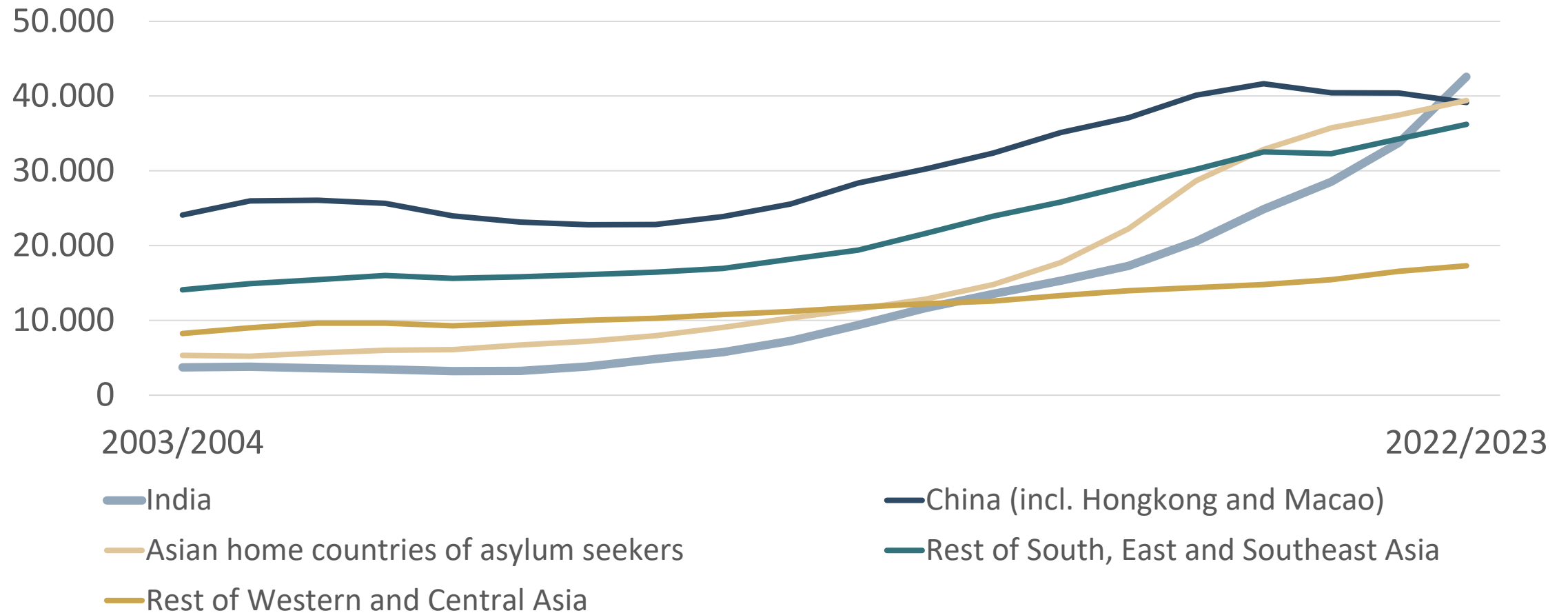
Numbers of international students in the respective winter semesters



Source: Geis-Thöne. 2024

# In particular from India

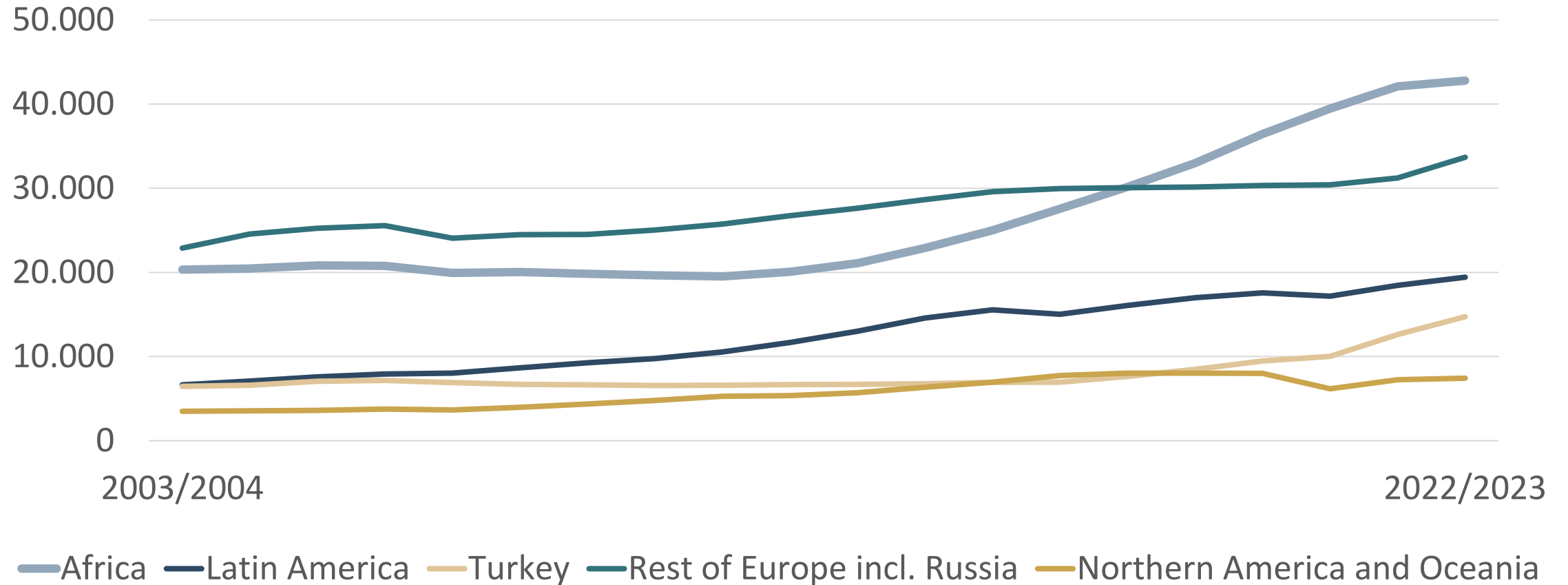
Numbers of international students from Asia in the respective winter semesters



Source: Geis-Thöne. 2024

# But also from Africa

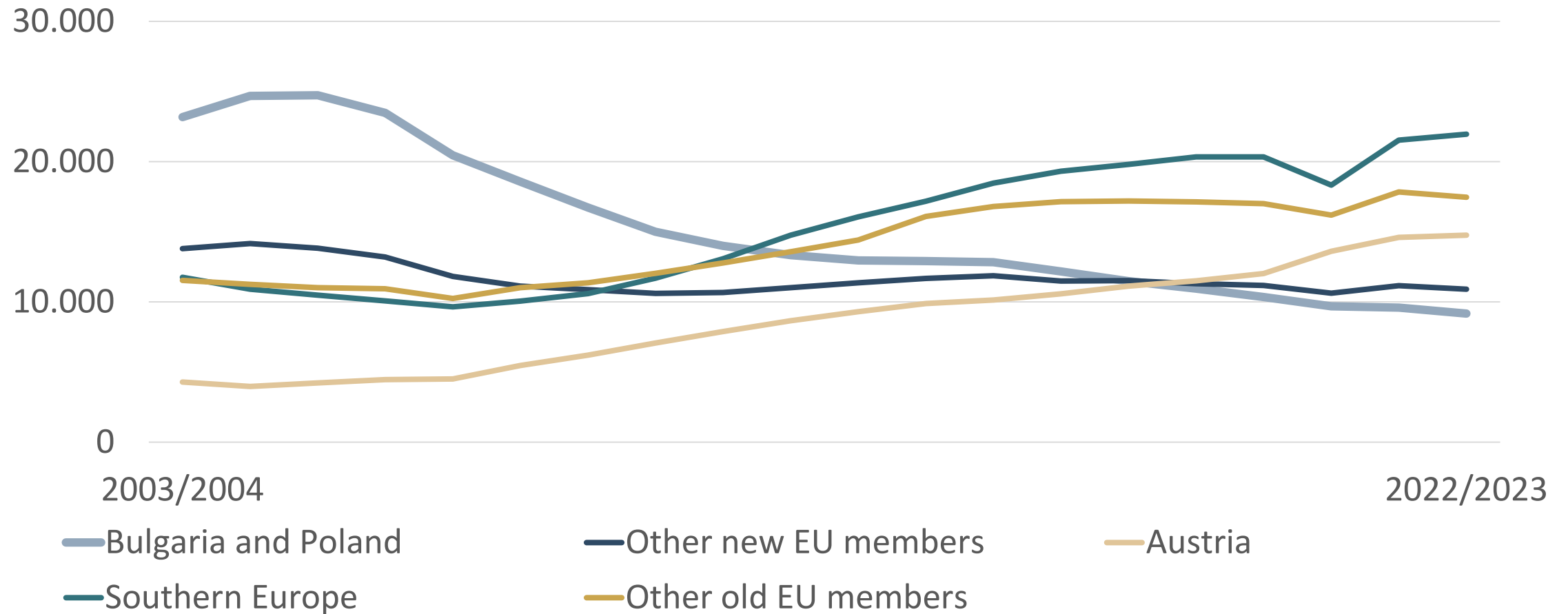
Numbers of international students from other third countries



Source: Geis-Thöne. 2024

# Less international students come from the new EU-members

Numbers of international students from EU-countries



Source: Geis-Thöne. 2024

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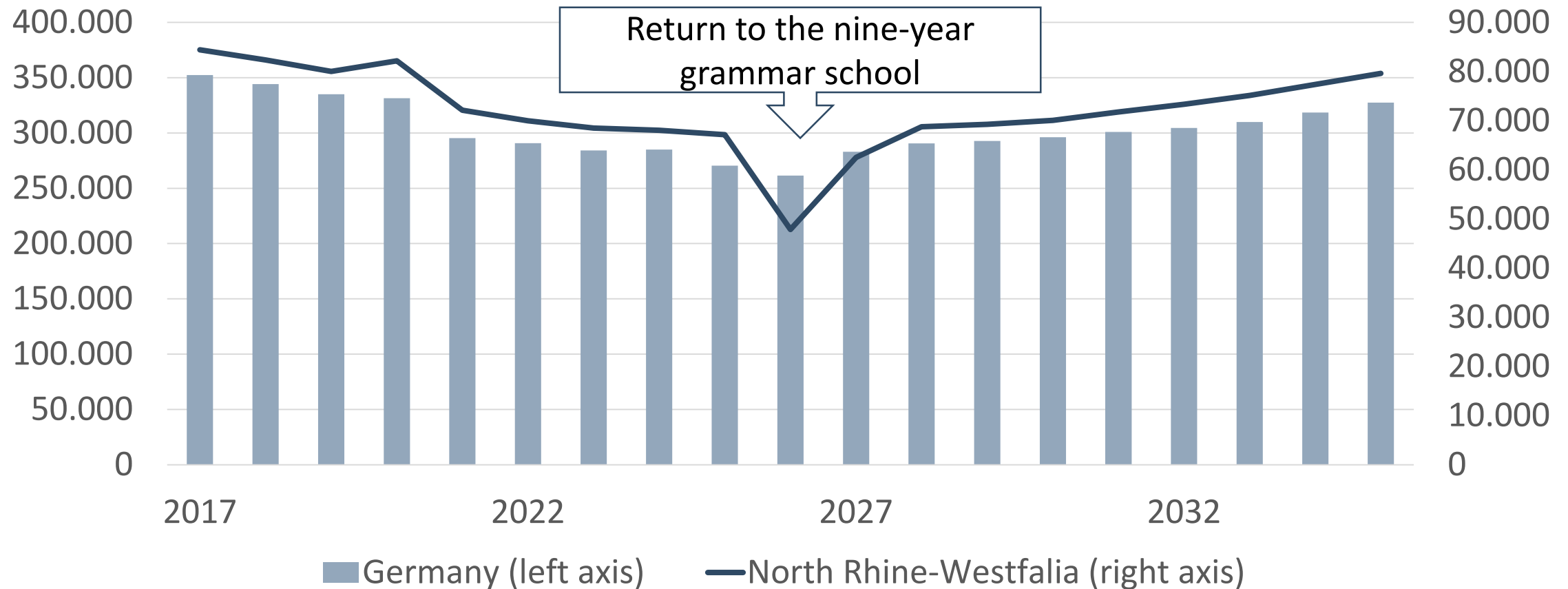
Universities have the potential to educate even more international students

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Conclusion: The education of international students must be further strengthened

# Fewer people from Germany are coming to universities

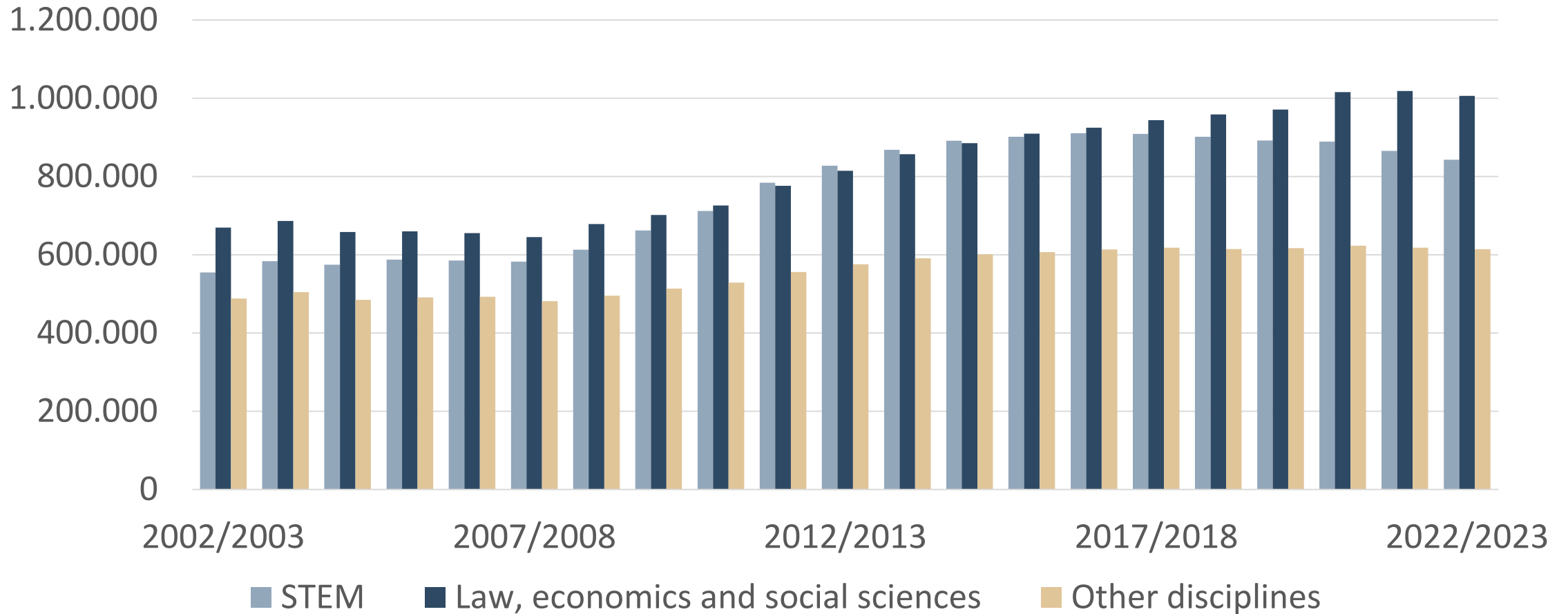
Projected number of first-year students with a domestic higher education entrance qualification, until 2023 actual values



Source: KMK, 2024

# In particular, the number of domestic STEM students is falling

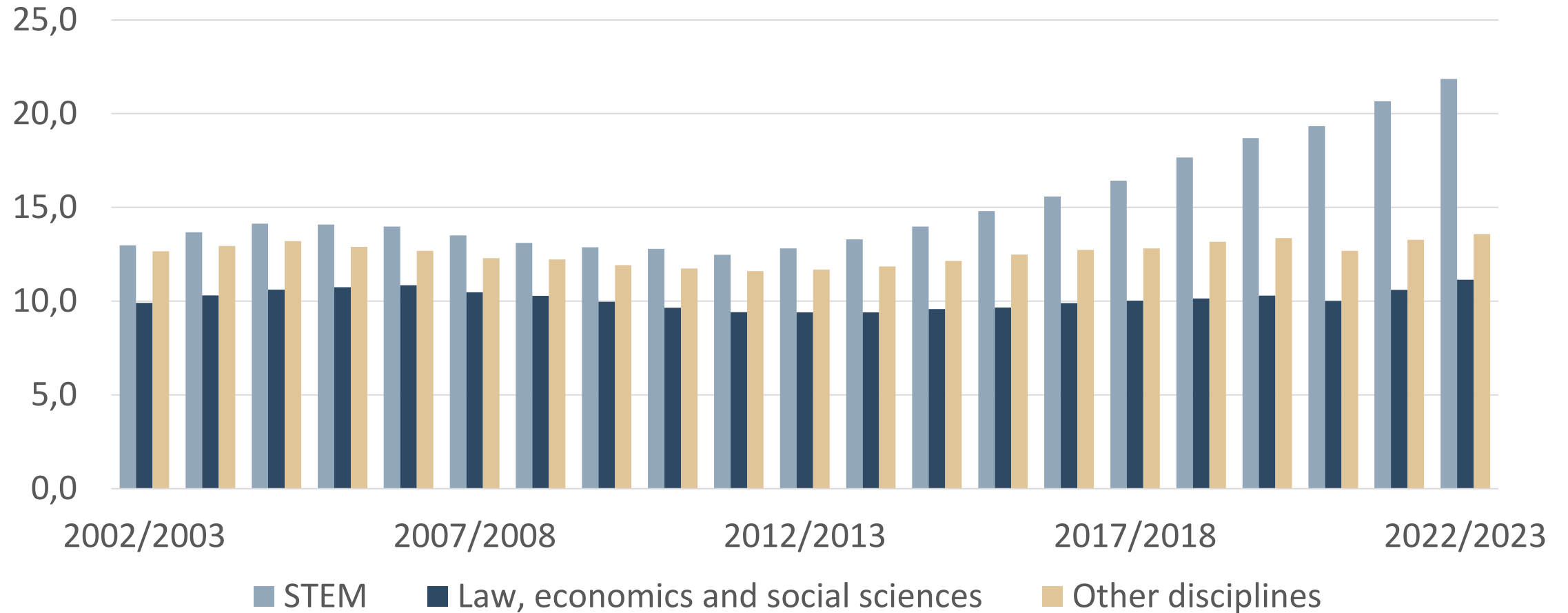
Students with German citizenship in the respective winter semesters



Source: Geis-Thöne. 2024

# Foreign students do already fill these gaps

Shares of students with foreign citizenship in the respective winter semesters



Source: Geis-Thöne. 2024



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# Education of international students should be strengthened

Three areas need to be addressed

Attracting more students from abroad



Improving the academic success of international students



Supporting the transition of international students into the labor market

# PANEL DISCUSSION

**11:00-11:30 Uhr**



# *COFFEE BREAK*

**11:30-11:50 Uhr**



# **SESSION 1 CHAIR: PROF. DR. MÜGE KLEIN, TURKISH- GERMAN UNIVERSITY/TURKEY**

# **BRIDGING THE GAP: NAVIGATING SKILLS SHORTAGE THROUGH ARTIFICIAL INTELLIGENCE**

**Prof. Dr. Alessandro Spano, Virginia Angius, Serena Racis, University of Cagliari/Italy**

**11:50-12:10 Uhr**



**BRIDGING THE GAP:  
NAVIGATING SKILLS  
SHORTAGE THROUGH  
ARTIFICIAL  
INTELLIGENCE**

ALESSANDRO SPANO  
VIRGINIA ANGIUS  
SERENA RACIS  
UNIVERSITY OF CAGLIARI



# AIM OF THE RESEARCH



- ✓ To explore AI's **transformative potential** in addressing the skills shortage
- ✓ To explore **risks, benefits, and implications** of using AI in addressing the skill shortage







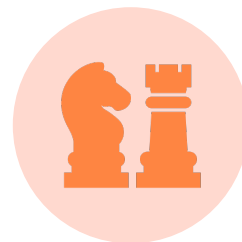
# FUTURE IMPACT

- ✓ By 2030, **375 million** individuals (14% of the global workforce) might be required to **change jobs** due to AI-induced technological changes (Morandini et al. 2023).
- ✓ Other studies predict the "**destruction** of some jobs and the **obsolescence** of some skills" (The World Bank, 2024).

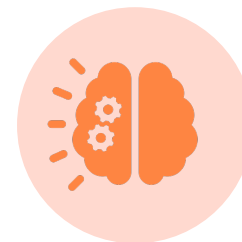




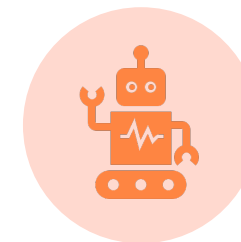
# ARTIFICIAL INTELLIGENCE AND 4TH INDUSTRIAL REVOLUTION



**NARROW AI**  
FOCUSES ON  
ONE TASK



**GENERAL AI**  
PERFORMS  
LIKE HUMANS



**SUPER AI**  
SMARTER  
THAN HUMANS





# ARTIFICIAL INTELLIGENCE AND 4TH INDUSTRIAL REVOLUTION

✓ AI's potential to **augment** human capabilities and fill skill gaps

→ "A system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation"  
(Kaplan e Haenlein, 2019)



# A GREAT DILEMMA

Will AI be used to “**augment**” human labour or to “**automate**” it? (Brynjolfsson, 2022)

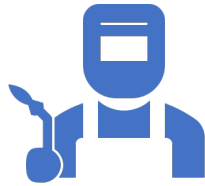
- In the first case, humans can do things they could not do without AI and **complement** each other
- In the second case, AI will **replace** humans.



# SKILL GAP AND SKILL SHORTAGE



The **skills required** by the job market but currently not possessed by the workforce



The **scarcity of skilled workers** in a specific field, which can be due to several factors



Skill gap as a consequence of tools to address skill shortage



# RESEARCH QUESTION

How does artificial intelligence address the  
skill gap?

And the skill shortage?





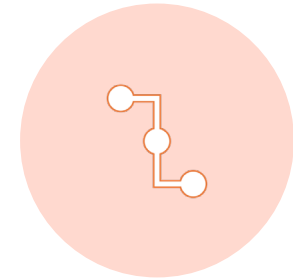
# SYSTEMATIC LITERATURE REVIEW



- ✓ Rooted in **intellectual capital** theory to comprehensively understand how AI can serve as a transformative tool in **mitigating skills shortages**, investigating both advantages and critical aspects



# INTELLECTUAL CAPITAL



THE SET OF **INTANGIBLE ASSETS** OF A FIRM  
OR ORGANISATION

(EDVINSSON & MALONE, 1997 IN  
BUENECHEA-ELBERDIN, 2017, P.2)

THE PROCESS OF  
EFFECTIVELY UTILISING  
**KNOWLEDGE**

(DING, 2010)

**human**  
capital

**structural**  
capital, (aka  
resource or  
organisa-  
tional capital)

**relational**  
capital (aka  
social or  
customer  
capital)

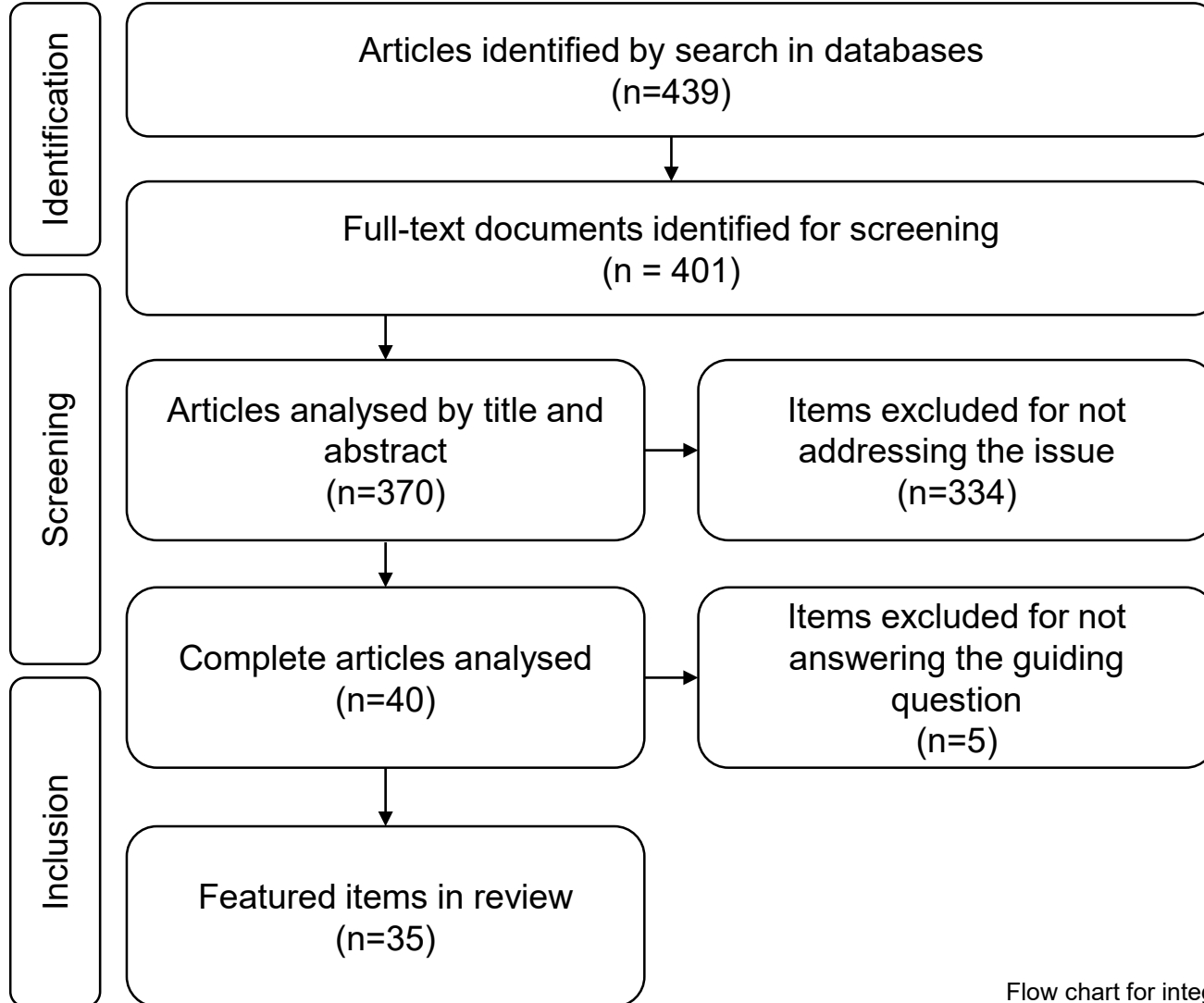
**technological**  
capital,  
spiritual capital  
(Khalique et al.,  
2013).





# DATA COLLECTION

## AND INCLUSION CRITERIA



"Artificial Intelligence"  
AND "skill\* shortage"  
OR "skill\* gap"

### Inclusion criteria:

Book chapters, **peer-reviewed** articles and conferences proceeding in Google Scholar, Web of Science and Scopus databases.

IC1: Discusses AI's potential to reduce skills shortages in the work environment.

IC2: Discusses AI's potential to augment workers' skills.

IC3: Reports on case studies using AI in the working environment to support workers.

EC1: Mentions the skills gap as a threat brought by AI, but not whether AI can help to close this skills gap.

EC2: Focuses on the skills gap, which is unrelated to AI.

EC3: Focuses on closing the skills gap and AI through new teaching and learning methods in the education sector.

# RESULTS



SKILL  
SHORTAGE



SKILL GAP



RISKS



BENEFITS



PROCESS  
IMPLICATIONS



PRODUCTIVIT  
Y

# RESULTS: AI AS A TOOL FOR SKILL SHORTAGE



AI Enhances  
**Workforce**  
Productivity and  
Upskilling



Supports and  
compensates for an  
**Ageing Global**  
**Workforce**



Addresses  
**Educational**  
**Mismatches**



# RESULTS: AI AND SKILL GAP



**Skill Disruption** due to Technological Advancements: deskillling, re-skilling, up-skilling



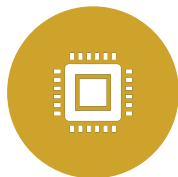
AI assists healthcare practitioners but **cannot replace the essential human elements** of the clinician-patient relationship



Critical thinking, problem-solving, and digital **skills are becoming more crucial**



New **job requirements** in cybersecurity, analytics, AI, and programming



Critical lack of AI specialists and a **slow adaptation of educational systems** to the demands of emerging technologies



# RESULTS: RISKS

Job security

Lack of adequate infrastructure and workforce training

Worker deskilling, unhealthy dependence on technology

Inequalities, especially in underprivileged regions

AI's "black box" nature: transparency and accountability, cybersecurity

High cost, especially in industries with low profit margins

Individual autonomy and human decision-making capabilities

Ethics, Governance, Privacy

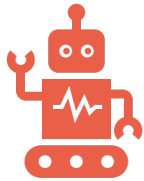


# SCHWARZENEGGER



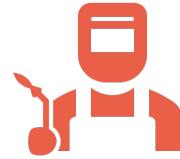
© Western Production of a James Cameron Film. Arnold Schwarzenegger "The Terminator" Michael Biehn, Linda Hamilton. Director of Photography Adam Greenberg. Executive Producers John Daly and Derek Gibson. Written by James Cameron. Produced by James Cameron. Released by Rank Film Distributors

# RESULTS: BENEFITS



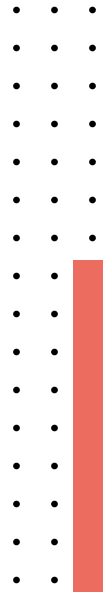
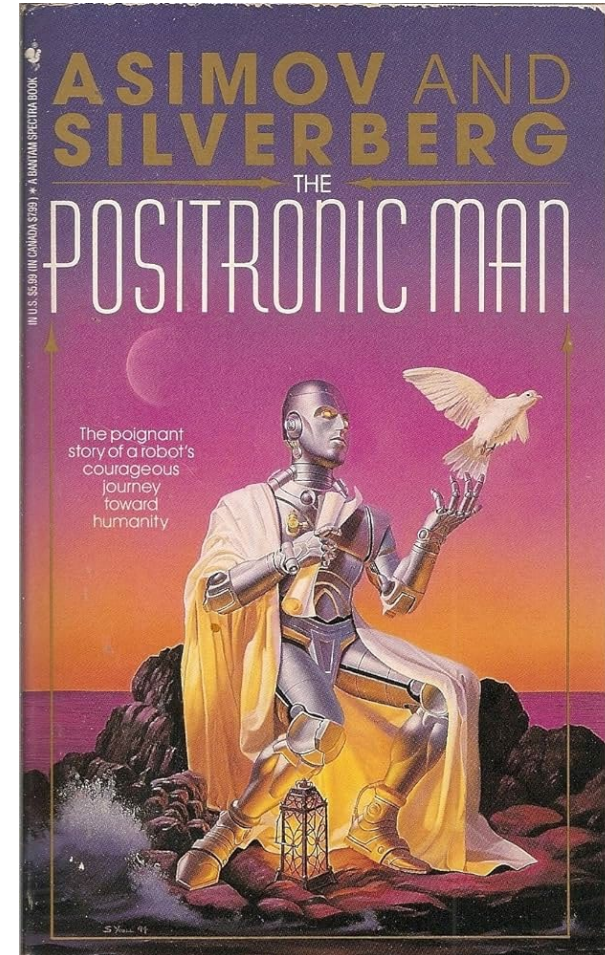
## General Benefits of AI and Automation:

- Increased productivity, safety, and quality.
- Reduced costs and production times.
- Impacts all economic sectors, notably in construction, manufacturing, and healthcare.



## Job Market and Work Conditions:

- AI technologies substitute some jobs but also create new opportunities.
- AI improves work and safety conditions, particularly with smart wearables enhancing occupational health and safety in manufacturing.



# RESULTS: BENEFITS



## Construction Sector

Optimized operations, enhanced productivity, and efficiency.  
 Reduces transportation and material costs.  
 Improves worker safety through monitoring and alert systems.  
 Augments skills  
 Addresses labor shortages



## Healthcare Sector

Developed countries: +efficiency  
 Less developed countries: addresses skill gaps and doctor shortages.  
 Aids training.  
 Improved diagnostics and treatments



## Agricultural Sector

AI-driven precision technologies tailor crop and animal treatments, enhancing environmental resilience.



## Auditing and Finance

AI increases the effectiveness and efficiency of decision-making.  
 Boosts trust in audit results and persuasiveness.



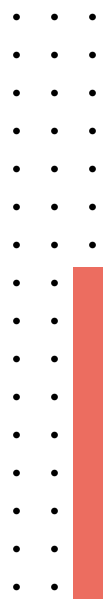
## Human Resource Management

Analyzes vast data sets  
 Improves recruitment, performance evaluations, and organizational learning  
 Machine learning algorithms provide personalized training programs, optimizing workforce development.

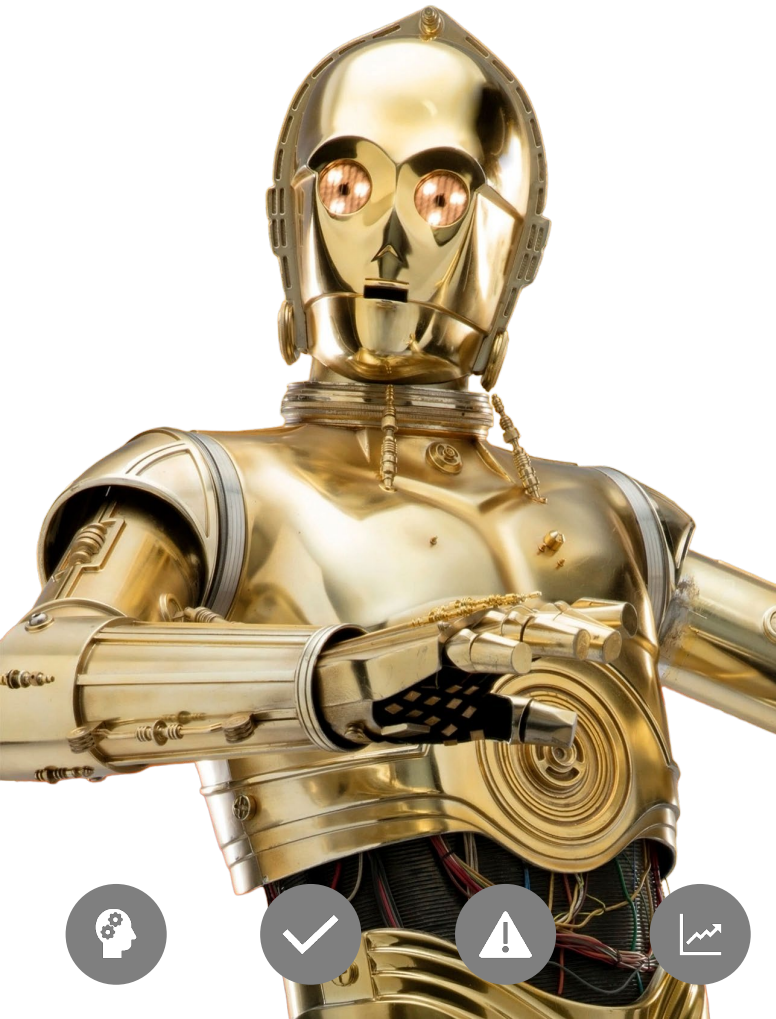


## Organizational Performance

AI facilitates value creation through enhanced collaboration and more efficient job activities.  
 Speeds up decision-making processes across various sectors.



# RESULTS: PROCESS IMPLICATIONS OF AI



- **Transforms** internal processes
- SME → **automation**, data-centric technologies, and advanced AI methods
- Health sector → **faster** screening and increased **efficiency**
- Task design, employee **engagement**, and overall workplace processes
- Generative AI tools **replace** or **complement** traditional tasks
- Greater **access** to information and democratization of higher-order skills, enhancing the quality and creativity of work outputs
- Increased **interaction** among employees





# RESULTS: AI AND PRODUCTIVITY

- **Enhanced** decision-making
- Manual tasks **automation** (i.e. in HR talent sourcing and payroll management)
- In construction: AI **overcomes** traditional limitations (improved safety, better design processes)
- In accounting: AI **reduces** error risks, and assists in strategic financial planning
- In healthcare: AI **streamlines** diagnostic processes and addresses skill shortages





# TAKE AWAYS & RECOMMENDATIONS



## **Strategic Management of AI:**

AI presents both opportunities and risks that need careful management → maximize AI's benefits while minimizing social and economic risks.

## **Upskilling and Reskilling:**

Continuous education and training are essential to prevent social crises and **increase** **reduce** inequality.

Strong emphasis on developing education programs to meet current and future organizational needs.

## **Collaboration is Key:**

Collaboration between academia and industry to develop relevant educational programs.

Cooperation between the private and public to address AI challenges and mitigating risks.

## **AI as an Asset in Intellectual Capital:**

AI is increasingly becoming a valuable asset in the intellectual capital discourse.

There is a need to rethink intellectual capital theory to include the cognitive capabilities of AI systems





# TAKE AWAYS & RECOMMENDATIONS

## **AI's Role in Workforce Dynamics:**

AI often augments human capabilities rather than replacing jobs outright, leading to newly configured roles and redesigned processes.

AI can help mitigate skill shortages by enhancing productivity and automating repetitive tasks.

## **Broader Implications and Concerns:**

AI applications range from construction to healthcare, improving safety, efficiency, and care.

Concerns include job polarization, ethical issues, and cybersecurity risks.

## **Proactive Strategies and Inclusive Policies:**

Long-term initiatives should focus on leveraging AI responsibly to address the skill shortage crisis effectively.

Policies and strategies need to promote inclusivity and resilience in the future workforce, tackling inequalities exacerbated by AI adoption.



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# **WHO ASPIRES TO GO AND WHY – AN ANALYSIS AMONG TURKISH UNIVERSITY STUDENTS**

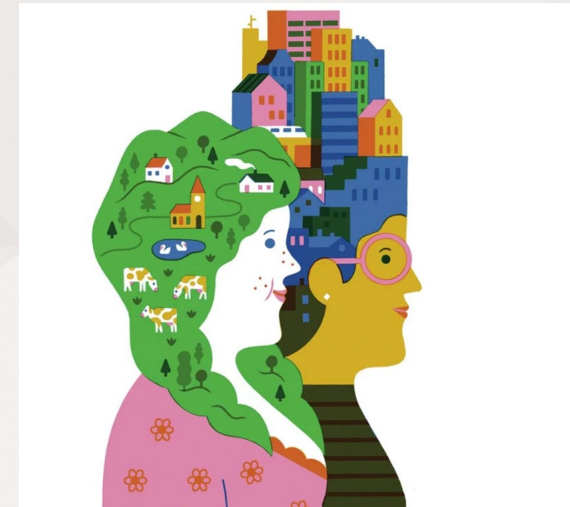
**Dr. Nilgün Dağlar-Sezer, Selin Karaca Varinlioğlu, Merve Ahter Dede, Alper Engin,  
Prof. Dr. Dilek Zamantılı Nayır, Prof. Dr. Vivian Carstensen, Turkish-German  
University/Turkey and HSBI/Germany**

**12:10-12:30 Uhr**

# WHO ASPIRES TO GO AND WHY – AN ANALYSIS AMONG TURKISH UNIVERSITY STUDENTS

3rd Bielefeld International Conference on Applied Business (BiCAB)  
“Skills shortage- approaches and solutions from universities, companies  
and politics”  
17 May 2024  
Bielefeld University of Applied Sciences and Arts, Bielefeld, Germany

Nilgün Dağlar Sezer (Bielefeld University of Applied Sciences and Arts)  
Selin Karaca Varinlioğlu (Turkish-German University)  
Merve Ahter Dede (Turkish-German University)  
Alper Engin (Turkish-German University)  
Dilek Zamantılı Nayır (Turkish-German University)  
Vivian Carstensen (Bielefeld University of Applied Sciences and Arts)



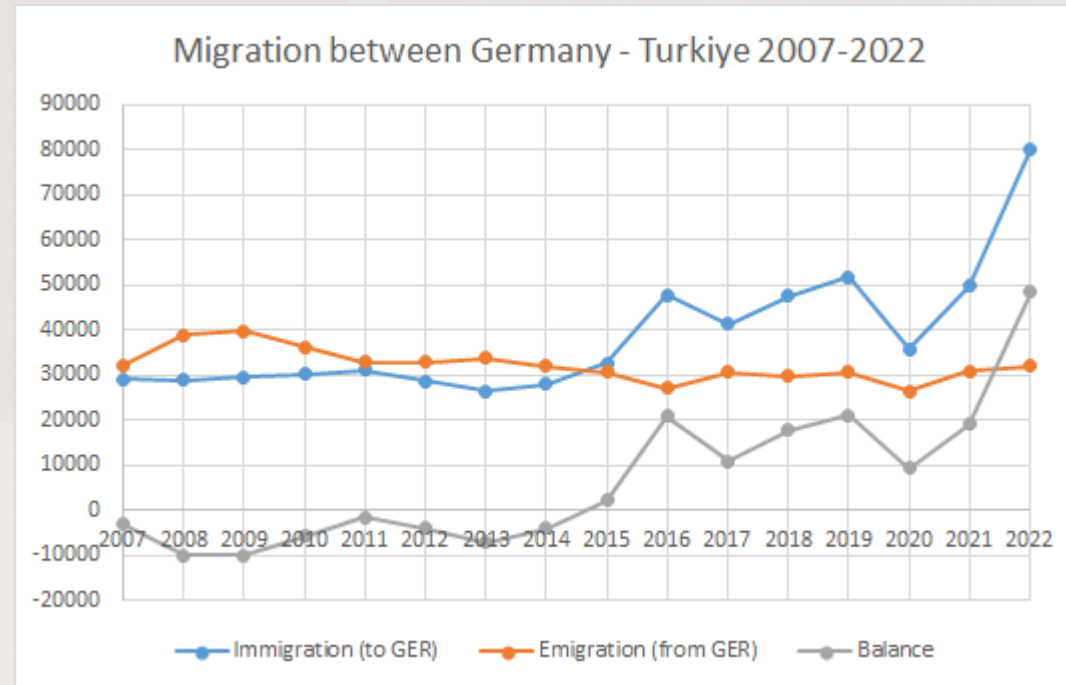
Personalities; © Till Hafenbrak für  
Psychologie Heute

# Agenda

- Introduction
- This paper
- Expats, Migration & Personality
- Methodology
- Findings
- Conclusion

# Introduction

- International Migration
- Migration between  
Turkiye and Germany:  
different time periods  
(Kesici 2021)
- Migration now: more  
towards Germany than  
Turkiye



(Source: own graphic; data: Federal Office of Statistics Germany: Migration Reports 2007-2022)



picture 1: Arrival of Turkish Migrants in 1964, Dortmund (source: Spiegel); picture 2: "Returner's table Istanbul" 2014 (source piyasa.de) picture 3: Sahsenem Korkmaz, Dilon Turkek and Firdevs Nur Atas, new in Germany/Munich as carers (source: Abendzeitung 2023)



## **This paper**

- **The paper focuses on the association between traits such as personal initiative, flexibility and risk attitude on expatriation and entrepreneurial intentions**
- **certain personality characteristics may find it difficult to adjust to their expatriation experience**
- **they consequently decide to return to their home country, while others may even start their own business**

# Expats, Migration & Personality

# The Types of Expatriates

- **Self-initiated expatriates** are individuals who independently choose to pursue a job abroad in order to take charge of their careers, generally driven by personal and life-oriented motivations, rather than through corporate assignment
- **Assigned expatriates** refer to employees who live temporarily outside their country of birth or citizenship to fulfill an organizational purpose, being relocated to another country by their company

# Dynamics of Migration

- **Turkish high-skilled migrants are seen as key potential contributors to the German economy, yet migration is a complex life event filled with challenges that necessitate both the right skills and personal traits for successful integration**
- **Research on the migration of highly skilled workers is diverse, covering topics from entrepreneurial effects to the personal, economic, and sociopolitical factors that influence the desire to work abroad**

# Personality Trait

<b>Personality Trait</b>	<b>Explanation</b>
<b>Personal Initiative</b>	Individuals who desire to establish their own businesses tend to be more willing to move.
<b>Flexibility</b>	Individuals who are good at adapting to new and changing environments tend to move and live in another country.
<b>Risk-Taking Propensity</b>	People who are more likely to take risks may find it easier to make choices like moving and living in another country.
<b>Openness</b>	Being open to new experiences make it easier to adapt to different cultures ad lifestyles which can influence the decision to move abroad.
<b>Emotional Resilience</b>	The ability to cope with challenges during the migration process can determine the success of long-term living abroad.

# Methodology

## Purpose

- **The study aims to examine the expatriation intentions of Turkish university students, focusing on how personality traits, entrepreneurial intentions, and demographic characteristics influence their willingness to relocate abroad.**
- **This study identifies key personality and demographic factors that influence Turkish university students' decisions to expatriate, thus providing valuable insights into migration patterns and workforce development in Germany.**

# Survey

- **The sample for the study consists of university students in Turkey at various educational levels—bachelor's, master's, and PhD.**
- **The survey incorporates ten scales to evaluate variables like geographic and job-related mobility, entrepreneurial mindset, proactive personality, coping flexibility, worry tendencies, self-efficacy, sensation seeking, and the Big Five personality traits.**
- **Responses were collected using a 5-point Likert scale, with some items being reverse-scored to enhance reliability.**



# Sample characteristics

*Table 4. Sample Characteristics*

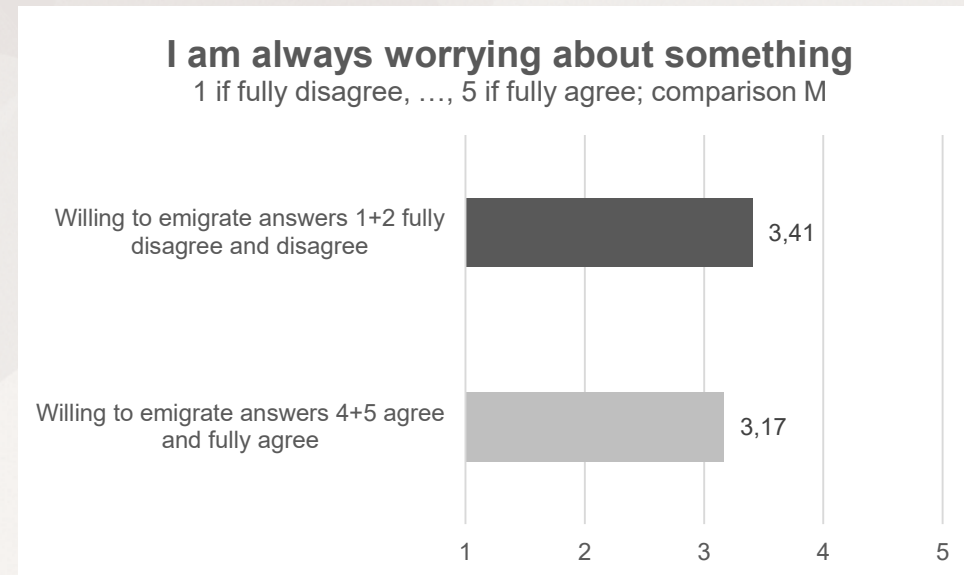
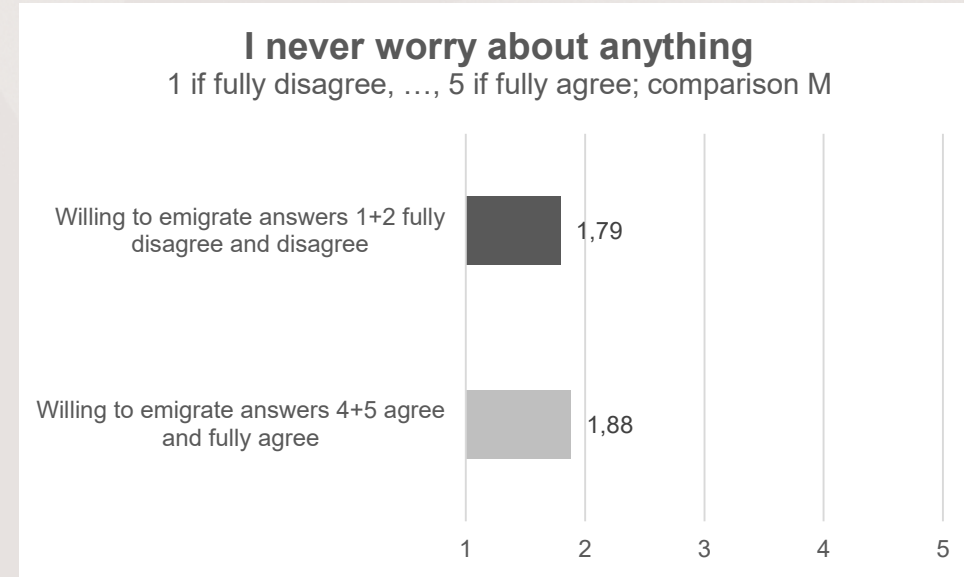
<i>Variable (N=310)</i>	<i>characteristic expression</i>	<i>n</i>	<i>percent</i>
<i>graduate from?</i>	<i>Anadolu/Fen lisesi</i>	217	70.0
	<i>Özel lise</i>	35	11.3
	<i>İmam Hatip Lisesi</i>	21	6.8
<i>Gender</i>	<i>Female</i>	177	57.1
<i>Age (M=21.45)</i>	18,19,20,21,22,23,24	298	96.1
<i>Grow up in...</i>	<i>Large city</i>	229	73.9
<i>Ever gone abroad?</i>	no	182	58.7
<i>Close family members abroad?</i>	yes	206	66.5

*Source: own data*

# Findings

## Comparison risk aversion proxy / (un)willing to emigrate

- hypotheses: young highly qualified people are more willing to gain experience abroad if they have certain characteristics
- In particular, the risk aversion proxy differs between those willing and unwilling to emigrate



## Findings: Big Five personality traits and expatriation

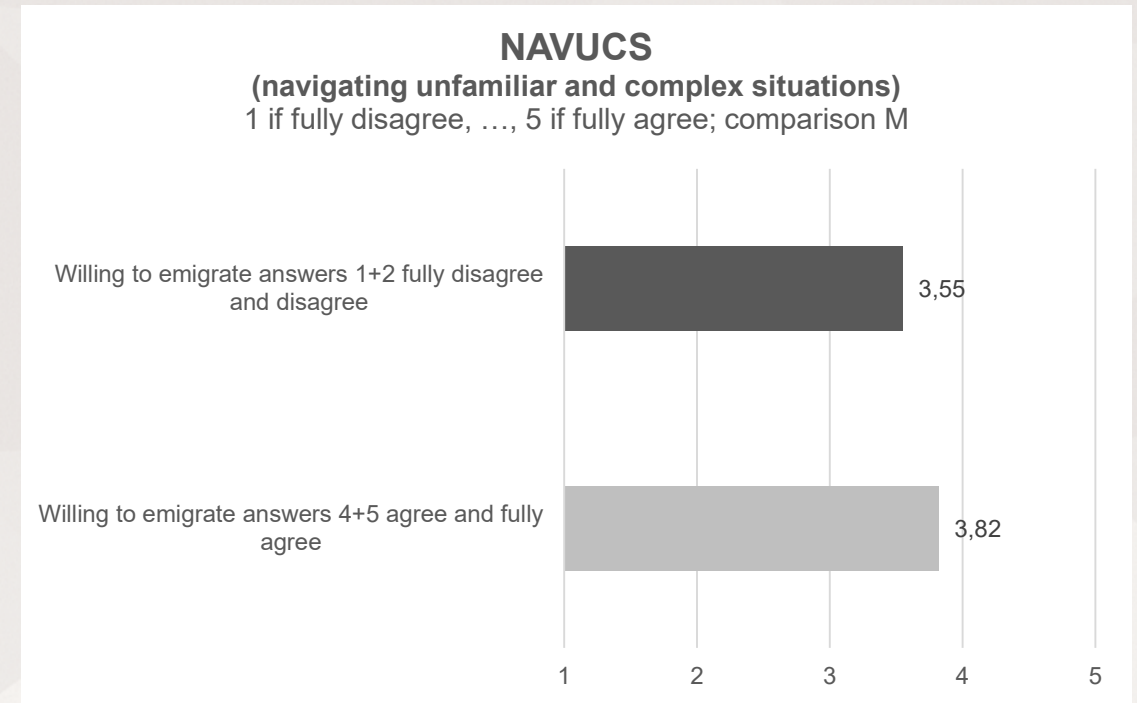
- Consistent with previous studies **openness is positively associated** with the willingness to temporarily move to a European country (expat2:  $\rho=0.12$ , 5% significance level)
- Likewise **agreeableness is positively associated** with permanent migration intentions (expat1:  $\rho=0.14$ , 5% significance level)
- Unlike previous studies, no significant correlation was detected between emotional stability and international mobility
- **female students seem to be more willing to temporarily migrate to Europe than their male peers** ( $\rho=0.14$ , 5% sign.)

## Findings: Big Five personality traits and entrepreneurial intentions

- **Extraversion**, however, is positively linked to all three proxies for entrepreneurial intentions (5% significance level, respectively)
  - strongest correlation for the “running my own business” variable (entrepr3,  $\rho=0.3$ )
- As expected, **risk aversion is negatively associated with entrepreneurial intentions** ( $\rho=0.21$ , 5% sign.) whilst risk seeking behavior is positively associated ( $\rho=0.11$ , 5% sign.)
- **Women** less likely to report intentions to start their own businesses ( $\rho=0.3$ , 5% sign.)

# NAVUCS

- navucs (Carstensen/ Dağlar-Sezer 2024) is significantly and positively associated to the entrepreneurial aspirations variables
- this can also be recognised when comparing the mean values (s. figure)



## Conclusion

- Aim: to examine the expatriation intentions of Turkish university students, focusing on how personality traits, entrepreneurial intentions, and demographic characteristics influence their willingness to relocate abroad
- Open mindedness, agreeableness and a high NAVUCS-score are related to more willingness to move
- Women have a different typology in the context of personality, migration and the idea of starting an own business
  - More willing to emigrate; less willing to start an own business
- personality traits have a central influence on the intention to migrate
- how these are related to the external circumstances of migration would be an interesting follow-up question

# Thanks for your attention

**3rd Bielefeld International Conference on Applied Business (BiCAB) on  
“Skills shortage- approaches and solutions from universities, companies and politics”**

**17 May 2024**

**Bielefeld University of Applied Sciences and Arts, Bielefeld, Germany**



# NAVUCS question:

**“I perceive the challenges of new or unfamiliar situations as an opportunity to try out new terrain.”**

3rd Bielefeld International Conference on Applied Business (BiCAB) on  
“Skills shortage- approaches and solutions from universities, companies and politics”

17 May 2024

Bielefeld University of Applied Sciences and Arts, Bielefeld, Germany

# **„IF YOU CAN'T GET NEW PEOPLE, AT LEAST DON'T SNUB THE ONES YOU HAVE“ – ORGANIZATIONAL CYNICISM OF EMPLOYEES IN TIMES OF SKILLS AND LABOUR SHORTAGE**

**Prof. Dr. Jan Schilling, HSBI/Germany**

**12:30-12:50 Uhr**



**“If you can’t get new people, at least don’t snub the ones you have” – Organizational cynicism of employees in times of skills and labor shortage**

Jan Schilling

Bielefeld International Conference  
on Applied Business (BiCAB)  
17th May 2024

[jan.schilling@hsbi.de](mailto:jan.schilling@hsbi.de)

# ORGANIZATIONAL CYNICISM AND THE LABOR MARKET



- Industries desperately searching for employees in the “**war for talents**” (Kochhan et al., 2021)
- **Study** on how to **attract personnel** (representative sample of 11.600 German companies; Kossler et al., 2017): 32 % of all positions are filled via **personal contacts and recommendations of the employees** (in small companies: 47 %)
- **Importance of minimizing cynical beliefs:**
  - Cynical employees are more likely to **leave the organization** (Chiaburu et al., 2013; Cordes & Dougherty, 1993)
  - Cynical employees will most certainly not recommend it, but rather **contribute to a negative public reputation**

# ORGANIZATIONAL CYNICISM



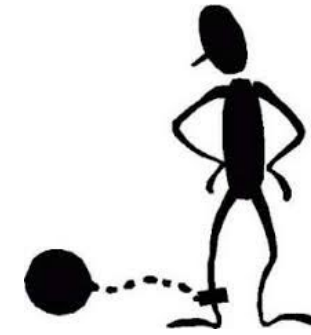
## I **Definition:** “a negative attitude toward one’s employing organization, comprising three dimensions:

- (1) a belief that the organization **lacks integrity**;
- (2) **negative affect** toward the organization; and
- (3) tendencies to **disparaging and critical behaviors** toward the organization that are consistent with these beliefs and affect”  
(Dean, Brandes & Dharwadkar, 1998, p. 345)

## I **Pervasiveness:**

- **40% of all employees** are estimated to be at least partly cynical (Feierabend & Pfombeck, 2018)
- 40 percent of the employees had **cynical thoughts** at least sometimes, 19 percent experienced **cynical emotions**, and 60 percent showed some form of **cynical behaviors**

# ANTECEDENTS OF ORGANIZATIONAL CYNICISM



- **Perceived injustice and broken psychological contracts** (e.g. Andersson & Bateman, 1997; Chiaburu et al., 2013; Fitzgerald, 2002; Hartl, 2008; James, 2005)
- **Lack of employee participation** (e.g. Chiaburu et al., 2013; Hartl, 2008; James, 2005; Mehlmann, 2008).
- **Cynical behaviour of colleagues** (e.g. Kuo et al., 2013; Wilkerson et al., 2008) and **negative behaviour of supervisors**: authoritarian (Jiang et al. 2017), exploitative (Elsaied, 2022) or toxic leadership (Dobbs & Do, 2022)
- **work-related stress** (Chiaburu et al., 2013) and **conflicts** (e.g. role and value conflicts; Naus et al., 2007)

# CONSEQUENCES OF ORGANIZATIONAL CYNICISM



## I Attitudinal consequences:

- **Lower optimism** (Eaton, 2000), **emotional exhaustion** and **burnout** (Johnson & O'Leary-Kelly, 2003; Pugh et al., 2003),
- **Lower motivation and higher job dissatisfaction** (Chiaburu et al., 2013; Johnson & O'Leary-Kelly, 2003; Scott & Zweig, 2008)

## I Behavioural consequences:

- **Less engagement and lower levels of performance** (Brandes et al., 1999; Chiaburu et al., 2013; Hartl, 2008)
- **Deviant** (Afshan et al., 2021; Jiang et al., 2017), **counterproductive work behavior** (Eaton, 2000; Evans et al., 2011; Shahzad & Mahmood, 2012)
- **Higher levels of absenteeism and turnover intention** (Chiaburu et al., 2013; Cordes & Dougherty, 1993)



## AIM UND METHOD OF THE STUDY

- **Aim of the study:** broaden our knowledge on the relationships and implications of the three facets of organizational cynicism
- **Online-questionnaire** distributed to persons working in a medium-sized real-estate company
- **Items and scales:**
  - **Demographic questions** (gender, age, organizational tenure, leadership position, and department)
  - **Organizational cynicism scale** (Abhari & Schilling, 2007)
  - **Other scales:** Trust (Albrecht und Sevastos, 1999), affective commitment (Schmidt, Hollmann & Sodenkamp, 1998), procedural and distributive justice (Colquitt, 2001), Strain (Mohr et al., 2006), Organizational citizenship behaviour (Staufenbiehl & Hartz, 2000),





## MAIN FINDINGS

- **Trust** is negatively related to the cognitive facet of organizational cynicism, and also the behavioral facet
- **Organizational commitment** is not predicted by affective organizational cynicism in general, only the feelings of shame and anxiousness
- **Distributive justice** is predicted by affective organizational cynicism, but not by the cognitive facet
- **Procedural justice** is related to the cognitive and behavioral facet of organizational cynicism
- **Psychological strain** is related to affective organizational cynicism, but not the other two facets
- **Organizational Citizenship Behavior** can be predicted by the cognitive, but not the behavioral facet



## DISCUSSION

- Results underline the **importance of investigating the three facets** of organizational cynicism as they show differential relations with important workplace variables
- **Cognitive cynicism** as the core feature: close relationships with trust, affective commitment, procedural justice, and OCB
- **Affective cynicism** (especially shame and anxiousness) particularly important for affective commitment, stress and perceptions of distributive justice
- **Behavioral cynicism** showed negative relations with procedural justice (informal critique of feeling neglected in organizational decision processes)



## PRACTICAL IMPLICATIONS

**Organizational cynicism** undermines the chance of employees recommending new talent for the organization

- **Align words and deeds** and be open about the reasons decisions or strategies are changed
- **Create opportunities** for top management to talk directly to employees from all levels to build up personal trust
- **Show and develop constructive leadership behavior** (positive role modelling, communicating meaning) to prevent negative feelings (shame and anxiousness)
- **Find constructive ways** on how to deal with cynical behavior like sarcastic humor, harsh criticism and cynical nonverbal behavior to prevent a cynical climate

# Thank you!

**Kontakt:**

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# *LUNCH BREAK*

**12:50-13:40 Uhr**




**SESSION 2 CHAIR: PROF. DR. DILEK ZAMANTILI NAYIR,  
TURKISH-GERMAN UNIVERSITY/TURKEY**

# **“HADI, GIDELIM!” - EVALUATING THE ATTRACTIVENESS OF JOB OFFERS ABROAD: INSIGHTS FROM TURKEY**

**Prof. Dr. Moritz Botts, Melih Pehlivan, Hilmi Berkay Abbasoğlu, Turkish-German  
University/Turkey**

**13:40-14:00 Uhr**



# “Hadi, gidelim!” - Evaluating the Attractiveness of Job Offers Abroad: Insights from Turkey

Moritz M. BOTTES   Melih PEHLİVAN   H. Berkay ABBASOĞLU

TÜRK-ALMAN ÜNİVERSİTESİ

İKTİSADİ VE İDARİ BİLİMLER FAKÜLTESİ

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## Agenda

- > Current Challenges
- > Theoretical Basis
- > Methodology
- > Results
- > Discussion

# Current Challenges

- Only **17.3%** of respondents reported feeling **happy**. The majority, comprising **52.5%**, described themselves as moderately happy, while **30.1%** considered themselves **unhappy**. The most prominent aspiration for the future is to **achieve a good life (46.7%)**.
- A significant proportion, **63%** of young people, expressed a desire to **live in another country** if given the opportunity. The top five preferred countries are as follows:

▶ Germany	<b>14.5%</b>
▶ USA	<b>13.8%</b>
▶ UK	<b>9.8%</b>
▶ Canada	<b>7.0%</b>
▶ Norway	<b>6.7%</b>



**63%**



**14.5%**



**17.3%**



**30.1%**



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## Current Challenges

---

- > With a lack of skilled workers, Germany tries to attract employees from abroad (Rahner, 2011)
- > Germany is an attractive work destination for Turks (Halm & Thränhardt, 2009; Konrad Adenauer Stiftung, 2023)
- > Competition between countries (see picture) and between employers



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Apply now

Picture Source: [www.facebook.com](http://www.facebook.com)

# Theoretical Basis

---

- > **Behavioral Economics/ Institutional Constraints:** Job decisions use limited number of cues (Baum & Kabst, 2013b; Petry, Treisch, & Peters, 2022).
- > **Signaling Theory:** Companies send hard (instrumental) and soft (symbolic) cues to prospective employees (Baum & Kabst, 2013a; Froese, Vo, & Garrett, 2010; Petry et al., 2022).
  - > **Experiences:** Previous migration leads to lower role of symbolic cues (Baláž, Williams, & Fifeková, 2016 ).
  - > **Employer Branding:** Companies can actively manage their signals (Backhaus & Tikoo, 2004).
  - > **Country Image:** Target country evaluation is influenced by country of origin effect (Froese et al., 2010) or even stereotypes (Zamantılı Nayır & Durmuşoğlu, 2008).

## Priming Experiment

- > **Positive Manipulation:** translated text from the website of Austrian Business Agency
- > **Negative Manipulation:** translated text from the website of Österreichische Botschaft Dakar (Senegal)
- > **Control:** no text

*Original texts are shown on the next slides.*

## LIVING &amp; WORKING

# Job search in Austria

Austria's unemployment rate is one of the lowest in the European Union. Nevertheless, due to the country's flourishing economy, the number of vacant positions is continually increasing. The chances of quickly finding a good job in Austria are very high.

© Rainer Berg / Westend61

## The job market in Austria

**Top career opportunities are offered to talented international specialists, especially in up-and-coming industries such as information and communications technology, electronics, electrical engineering and life sciences.**

A list of shortage occupations on a national and regional level is published each year. At present the list encompasses more than 100 professions. Third country nationals belonging to these specified occupational groups can submit an application for the Red-White-Red Card, taking advantage of simplified requirements for [skilled workers in shortage occupations](#).

[Einreise und Aufenthalt](#)

[Studieren in Österreich](#)

**Arbeiten in Österreich**

[Deutsch lernen](#)

[Über Österreich](#)

## Arbeiten in Österreich

Nicht-EU Bürger benötigen eine Arbeits- und Aufenthaltserlaubnis für alle Arten von Beschäftigung, einschließlich der Au pair-Anstellungen, es sei denn, Sie wollen weniger als 6 Monate in Österreich verbringen. Dann brauchen Sie eine Arbeitsbewilligung und ein Visum.

**Achtung:** Die Arbeitsbewilligung muss vom zukünftigen Arbeitgeber in Österreich und **vor** der Einreise des Antragstellers beantragt werden. Die Arbeitsbewilligung wird nicht während Besuchsreisen nach Österreich erteilt. Die Arbeitsbewilligung berechtigt nicht automatisch zum Aufenthalt in Österreich. Die Botschaft hat keine gesetzliche Kompetenz, Arbeitsplätze in Österreich zu vermitteln.

Für Nicht-EU-Bürger gilt das [Ausländerbeschäftigungsgesetz](#) (Bundesgesetz vom 20. März 1975, BGBl. Nr. 218). Eine Beschäftigungsbewilligung wird vom österreichischen Dienstgeber beantragt und ausschließlich vom Arbeitsmarktservice Österreich (AMS) erteilt. Voraussetzungen für die Erteilung einer Beschäftigungsbewilligung (bzw. in deren Vorfeld der Einzelsicherungsbescheinigung) sind gem. § 4 AuslBG eine entsprechende Lage und Entwicklung auf dem Arbeitsmarkt, die die Beschäftigung eines Ausländers erst zulässt, und die Wahrung wichtiger öffentlicher oder gesamtwirtschaftlicher Interessen. Dazu kommt noch die Bestimmung über die Bundeshöchstzahl gem. § 12a AuslBG.

Die österreichische Arbeitsmarktverwaltung ist bestrebt, die Ausländerbeschäftigung weitgehend auf den derzeitigen Stand zu beschränken, um für Inländer, jugendliche Ausländer der zweiten Generation und arbeitslose Ausländer der älteren Generation, die schon lange in Österreich leben, zusätzliche Arbeitsplätze bereitstellen zu können.

### Zum Thema

**WEB: Arbeitsmarktservice (AMS) →**  
[ams.at](#)

**INFO: Bundesministerium für Inneres →**  
[bmi.gv.at](#)

**WEB: Berufsanerkennung →**  
[berufsanerkennung.at](#)

**WEB: Leben und Arbeiten in Österreich**  
**→** [migration.gv.at](#)

**INFO: Punkterechner →** [migration.gv.at](#)

**WEB: Künstlermobilität →** [artist-mobility.at](#)

**WEB: Österreichischer  
Integrationsfonds →**  
[integrationsfonds.at](#)

# Discrete Choice Experiment

Attributes	Levels			
<b>Country</b>	Germany	Austria	Netherlands	Hungary
<b>Advancement Opportunity</b>	yes	no		
<b>Monthly Net Wage</b>	1,500 €	2,000 €	2,500 €	
<b>Working Hours per Week</b>	40h	45h	40h + overtime	
<b>Length of Contract</b>	1 year	3 years	unlimited	
<b>Company Culture</b>	competitive	family like	structured	



# Results

---

- > Strong effect of higher wages, followed by advancement option, and company culture
- > Country preference: Netherlands > Germany > Austria > Hungary, a negative manipulation leads to a stronger effect for Germany and no effect for Austria
- > Short contract has negative effect
- > No effect of working hours
  
- > No effects for migration experience, intention to work abroad, or demographic variables (age, gender, study field)

Table 2 *Binomial Regression on the Preference for Job Offers*

Variables	<i>Coeff.</i>	<i>SE</i>	<i>Marginal Effect</i>	<i>SE</i>
Intercept	0.123	0.227		
Germany	0.692***	0.183	0.144***	0.335
Austria	0.352†	0.181	0.074*	0.038
Netherlands	0.753***	0.187	0.157***	0.037
Advancement	0.969***	0.130	0.211***	0.027
1,500 € pM	-1.373***	0.161	-0.295***	0.031
2,000 € pM	-0.571***	0.157	-0.128***	0.031
40h pW	0.189	0.159	0.040	0.034
45h pW	0.095	0.157	0.020	0.033
1 year	-0.348*	0.159	-0.074*	0.034
3 years	-0.191	0.156	-0.040	0.044
Competitive	-0.794***	0.159	-0.170***	0.033
Family	-0.187	0.160	-0.039	0.033

Note: Significance levels are †  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

# Results

# Results

Table 4 *Comparison of Priming Experiment*

Variables	Positive Manipulation		Negative Manipulation		Control Group	
	<i>Coeff.</i>	<i>SE</i>	<i>Coeff.</i>	<i>SE</i>	<i>Coeff.</i>	<i>SE</i>
Germany	0.353	0.379	0.951**	0.337	0.900**	0.324
Austria	0.271	0.322	0.095	0.321	0.721*	0.344
Netherlands	0.593†	0.305	0.392	0.330	1.166***	0.341

## Discussion

---

- > Negative priming had clear effects
- > Country effect exists, though surprisingly little interaction with experiences
- > Instrumental attributes (wages, contract length) had stronger effects than symbolic attributes (advancement, stress)
- > Companies can calculate how much each attribute is “worth”

**Thank you very much  
for your attention!**

**Dr. Moritz M. BOTTS, Assistant Prof. of  
Marketing**

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# **DIGITAL TRANSFORMATION AND SKILLS SHORTAGE AS A HEN-EGG PROBLEM: COMPARISON OF GERMANY AND TURKEY**

**Prof. Dr. Müge Klein, Umut Ejder Halhallı, Prof. Dr. Sven Packmohr, Turkish-German  
University/Turkey and Malmö University/Sweden**

**14:00-14:20 Uhr**

# DIGITAL TRANSFORMATION AND SKILLS SHORTAGE AS A HEN-EGG PROBLEM: COMPARISON OF GERMANY AND TÜRKİYE

KLEIN (Turkish-German University), HALHALLI (Turkish-German University), PACKMOHR (Malmö University)

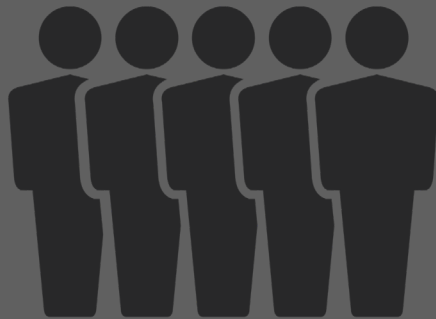
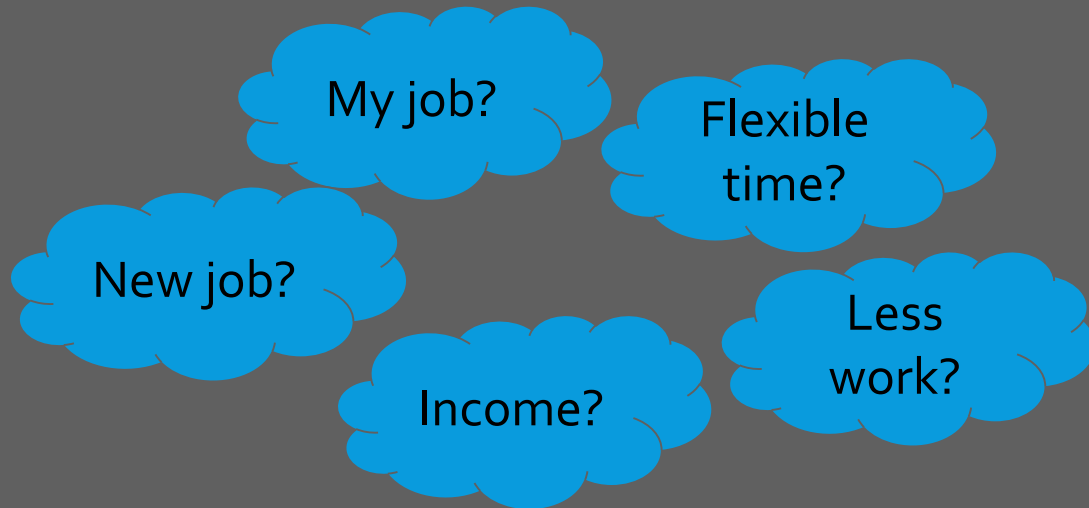
# AGENDA

- DIGITAL TRANSFORMATION & SKILLS SHORTAGE
- STUDY
- DATA COLLECTION
- DATA ANALYSIS
- FINDINGS

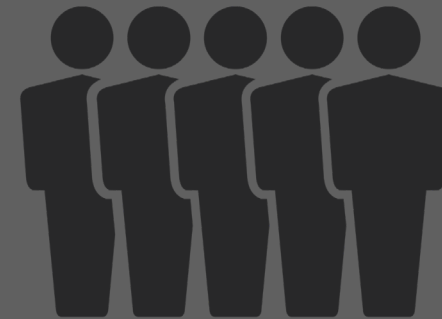
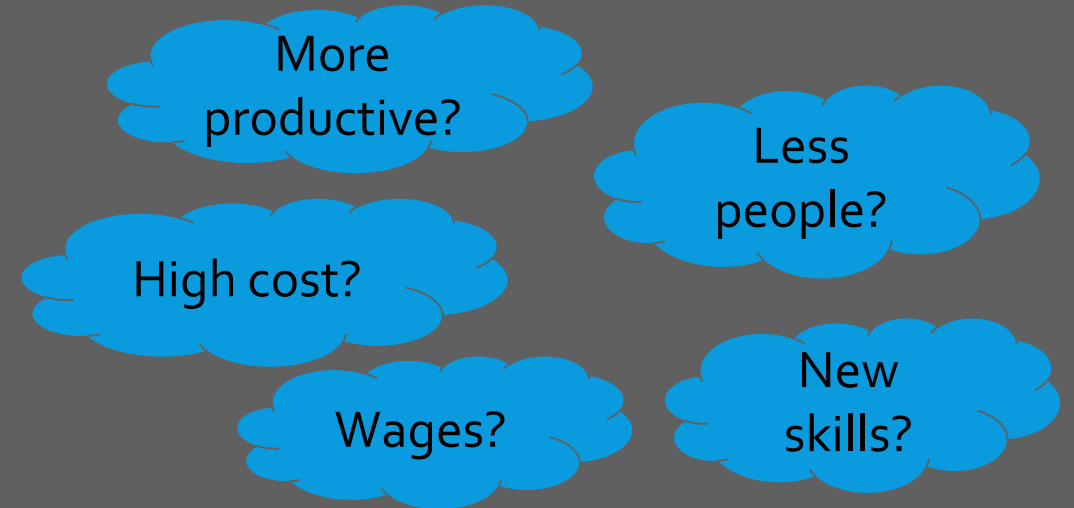


# DIGITAL TRANSFORMATION & SKILLS SHORTAGE

Divide of Two Thought Worlds



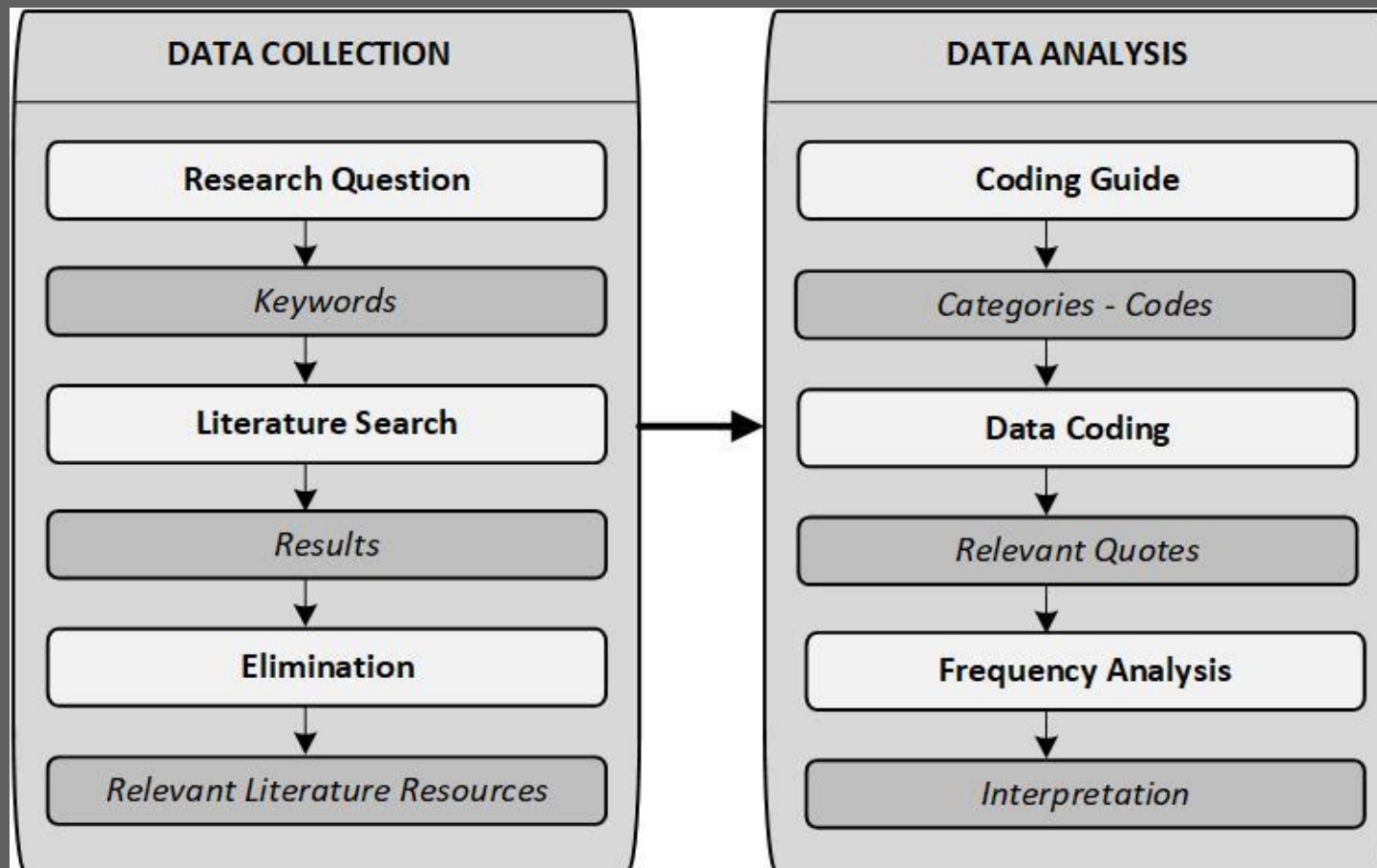
EMPLOYEES



EMPLOYER

# STUDY

## Deductive Content Analysis based on Literature Review



# DATA COLLECTION

## Research Question

*"Is Digital Transformation a cause or a solution of the skills shortage problem? Is there a difference on this issue between Türkiye and Germany according to literature's view?"*

# DATA COLLECTION

## Literature Search

- Google.Scholar database
- Combination of **11** keywords from **2** search clouds
- In **3** languages (ENG, GER, TUR)
- Limited to
  - title
  - time period **after 2010**

	Search Cloud DIGITALIZATION		Search Cloud SKILLS SHORTAGE
D1	Digitalization	S1	Unemployment
D2	Industry 4.0	S2	Employment
D3	Digital Transformation	S3	Workforce
D4	Artificial Intelligence	S4	Labor
D5	Technology	S5	Skills
D6	Automation		

# DATA COLLECTION

## Elimination

### ➤ Technical:

- Direct downloadable
- Journals, book chapters, reports, theses

### ➤ Contextual:

- Title  Abstract  Conclusion
- Perspectives about German and Turkish labor markets

Search	n	Search	n	Search	n	Search	n	Search	n	N
D1S1	2	D1S2	4	D1S3	3	D1S4	6	D1S5	1	16
D2S1	1	D2S2	7	D2S3	7	D2S4	2	D2S5	2	19
D3S1	1	D3S2	1	D3S3	0	D3S4	1	D3S5	1	4
D4S1	0	D4S2	0	D4S3	0	D4S4	1	D4S5	1	2
D5S1	2	D5S2	5	D5S3	0	D5S4	1	D5S5	0	8
D6S1	0	D6S2	0	D6S3	1	D6S4	0	D6S5	1	2
N	6		17		11		11		6	51

# DATA ANALYSIS

## Coding Guide

CRITERIA	CODE	EXAMPLE QUOTE
<b>1. DT as Solution for SkSh</b>		
1.1 Augmented work efficiency	Labor saving Labor substitution Productivity Unemployment	<i>“Many automation technologies are explicitly aimed to substitute cheaper capital (machines) in a range of tasks performed by humans.” (Acemoğlu et al., 2018)</i>
1.2 Better training for work	Training Education Learning	<i>“Today, blue collar employees will be transformed into knowledge workers simultaneously with various trainings in industry 4.0.” (Kurt, 2019)</i>
1.3 Better work-life balance	Flexible work Flexible organization Private life Work-life balance	<i>“Flexible work organization is promoted to enable all workers to continue professional development more effectively and have a better work-life balance. The relevant technologies will also allow older workers to extend their working lives and remain productive longer” (Xu, 2021)</i>

# DATA ANALYSIS

## Coding Guide

CRITERIA	CODE	EXAMPLE QUOTE
<b>2. DT as Cause for SkSh</b>		
2.1 New skills requirement	New skills Demand for skilled labor New requirements	<i>“Work environment is quickly changing due to technological advancements and Industry 4.0 is transforming jobs and required skills.” (Pereira et al., 2017)</i>
2.2 New jobs	New tasks New jobs New business models Other employment Increase of employment	<i>“There is agreement among the participants that Industry 4.0 technologies would not only eliminate jobs but also create new ones” (Bonekamp &amp; Sure, 2015).</i>
2.3 Income inequalities	Wages Income Inequality	<i>“However, it becomes evident that a growing number of researchers view the implications of Industry 4.0 technologies ... addressing consequences ... with reference to implications for social welfare and tax systems which may be completely reviewed in order to compensate for lost job income and balance off growing inequality” (Bonekamp &amp; Sure, 2015).</i>

# DATA ANALYSIS

## Data Coding

STUDY	QUOTES	CODING	
Ada, İliç & Saġnak, 2021	<i>"HR managers must pay attention to technical skills, ... more than the other criteria throughout the recruitment process in Industry 4.0 era."</i>	2.1	TR
Arntz et al., 2018	<i>"...companies that are already users of such technologies are more likely to see opportunities to increase productivity, better meet individual customer requirements and offer new products or services..."</i>	1.1	GER
	<i>"Overall, technological change is accompanied by weakly positive employment effects."</i>	2.2	
	<i>"Corporate investment in new technologies has also boosted inequality over the last five years by increasing employment and wages in high-wage occupations and sectors significantly..."</i>	2.3	
...	...	...	...
Karaaslan, 2021	<i>"By 2025, it is estimated that the time spent by humans and machines on current tasks in the workplace will be equal."</i>	1.1	TR
	<i>"Unskilled workers... are much less likely to receive training through their employers than workers who are not at risk of automation."</i>	1.2	
	<i>"Half of the current workforce needs to update their skills in the next five years."</i>	2.1	
	<i>"It is estimated that by 2025, 85 million jobs could be displaced... and 97 million new roles could emerge..."</i>	2.2	
...	...	...	...



# DATA ANALYSIS

## Frequency Analysis

CRITERIA	FREQUENCY	
	GERMANY	TÜRKİYE
<b>1. Solution – less skills shortage</b>	<b>15</b>	<b>14</b>
1.1 Augmented work efficiency	9	11
1.2 Better training for work	0	3
1.3 Better work-life balance	6	0
<b>2. Cause – more skills shortage</b>	<b>28</b>	<b>32</b>
2.1 New skills requirement	16	17
2.2 New job opportunities	8	13
2.3 Income inequalities	4	2

# FINDINGS

- **Digital Transformation** is seen more as a **cause** than a **solution** to **Skill Shortage** problem
- On a general level, there is **little difference** between perspectives of **Türkiye** and **Germany**
- Noticeable differences in specific aspects:
  - **Better training for work** more in **Türkiye**
  - **Enhanced work-life balance** more in **Germany**
  - **New job opportunities** more in **Türkiye**

	GERMANY	TÜRKİYE
<b>1. Solution – less skills shortage</b>	<b>15</b>	<b>14</b>
1.2 Better training for work	0	3
1.3 Better work-life balance	6	0
<b>2. Cause – more skills shortage</b>	<b>28</b>	<b>32</b>
2.2 New job opportunities	8	13

# THANKS FOR YOUR ATTENTION

KLEIN (Turkish-German University), HALHALLI (Turkish-German University), PACKMOHR (Malmö University)



Bielefeld International Conference on Applied Business (BICAB) on  
“Skills shortage- approaches and solutions from universities, companies and politics”  
17 May 2024, Hochschule Bielefeld, Bielefeld, Germany

# **DIGITALIZATION AS AN ANSWER TO SKILLS SHORTAGES? CHANGING PROCESSES AND REQUIREMENTS IN ACCOUNTING AND AUDITING AND THE IMPACT ON UNIVERSITY EDUCATION**

**Prof. Dr. Tim Kampe, HSBI/Germany**

**14:20-14:40 Uhr**



# Digitalization as an answer to skills shortages?

Changing processes and requirements in accounting and auditing and the impact on university education

Prof. Dr. Tim Kampe, Bielefeld School of Business

Bielefeld International Conference on Applied Business (BiCAB), 17.05.2024

# Digitalization as an answer to skills shortages? - Agenda

1. Introduction, objectives and methods
2. Status of digitalization in accounting
3. Purchase-to-pay or invoice-to-pay process without digitalization
4. Invoice-to-pay process after digitalization
5. Effects and status of digitalization in auditing
6. Discussion: Impact on university education
7. Conclusion

# 1. Introduction, objectives and methods

## Background

- Large (Big 4) Auditing Firms (Deloitte, PWC, KPMG, EY) were long among the **most attractive employers** in graduate surveys, but interest in the Big 4 as employers has *declined sharply* over the past 20 years
- The **image and reputation** of the auditing profession has suffered considerably as a result of recent accounting scandals
- A job in accounting or auditing is nowadays considered rather **boring and monotonous** by graduates



Auditing firms are desperately looking for young talent and accounting positions remain vacant for a long time

## Objectives

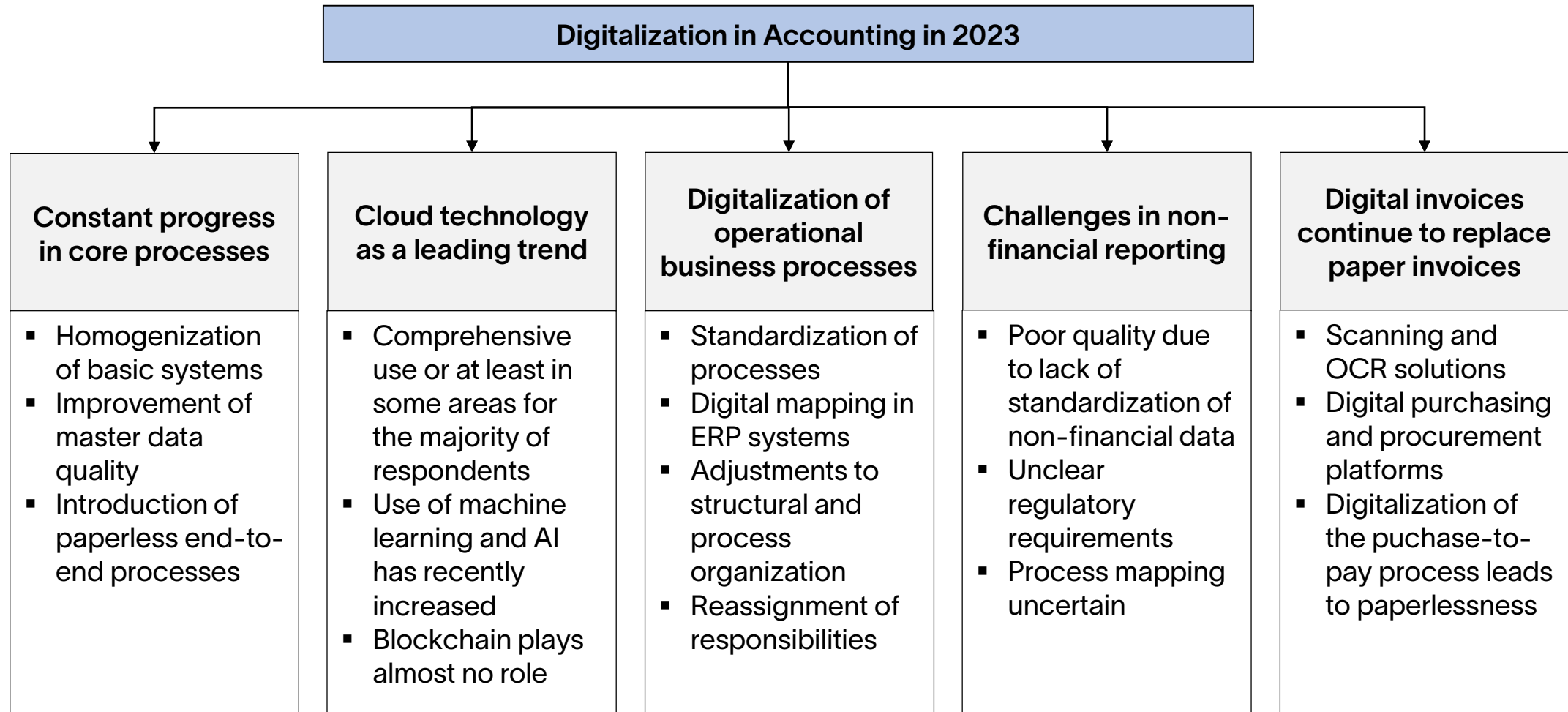
- Is digitalization a possible answer to skills shortage?
- If so, what does that mean for those working in accounting and auditing? What are the consequences for university education?

## (Mixed) Methods

- Extensive literature review with reference to existing **studies** (esp. KPMG, PWC, Deloitte)
- Synthetic and personal experience
- Qualitative empirical approach (12 expert **interviews** with auditors from East-Westphalia region)

Sources: Bleiber, 2023; Demelius et al, 2023; Hossenfelder, 2020, p. 241; Kampe, 2011, p. 96; Kreher et al, 2024; Mujkanovic, 2014, p. 25; Prümm et al, 2023

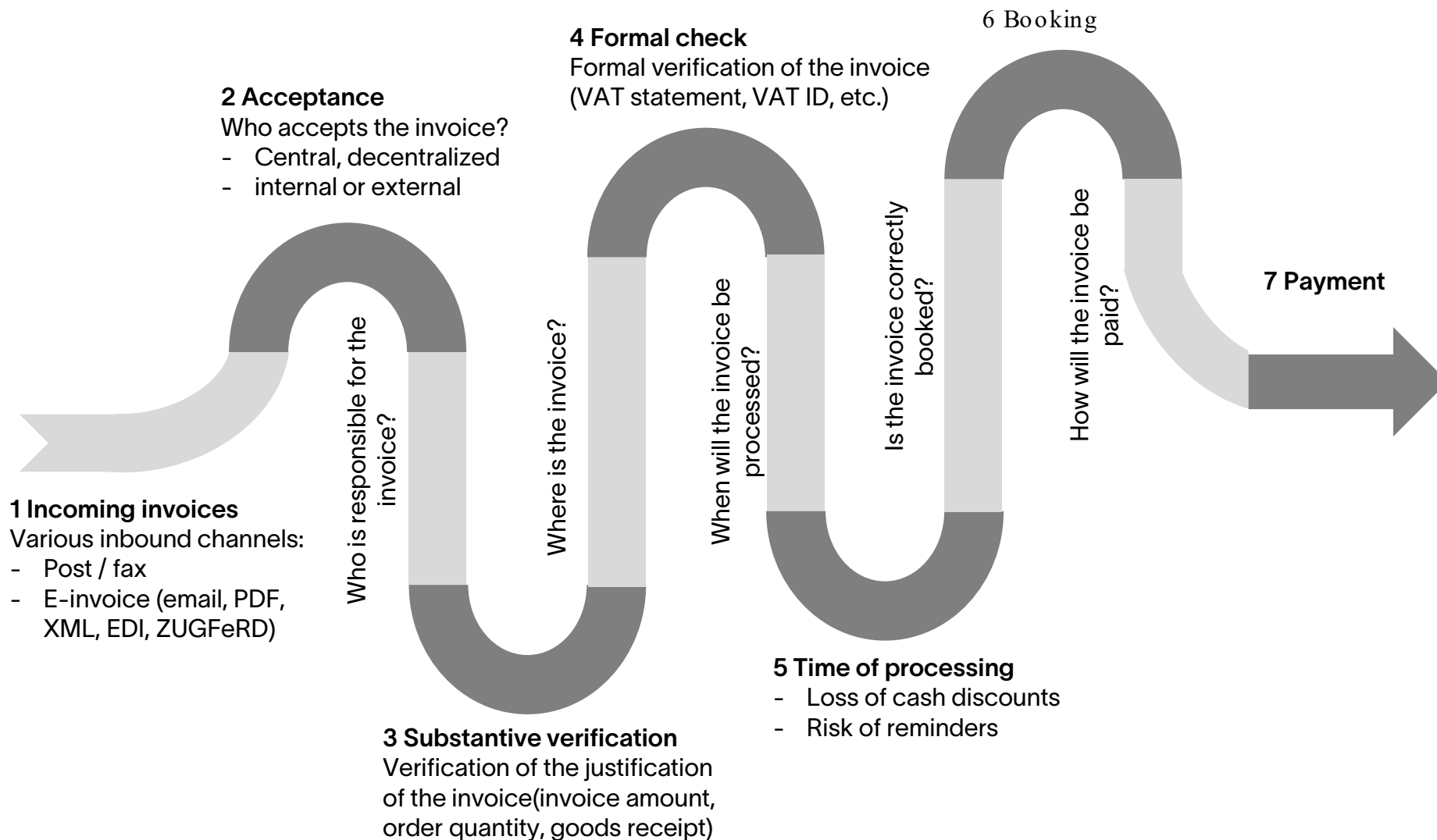
## 2. Status of Digitalization in Accounting



Sources: Bruckner, 2019, p. 237; Demelius et al, 2023; Kreher et al, 2021; Kreher et al, 2022; Kreher et al, 2024; Prümml et al, 2023

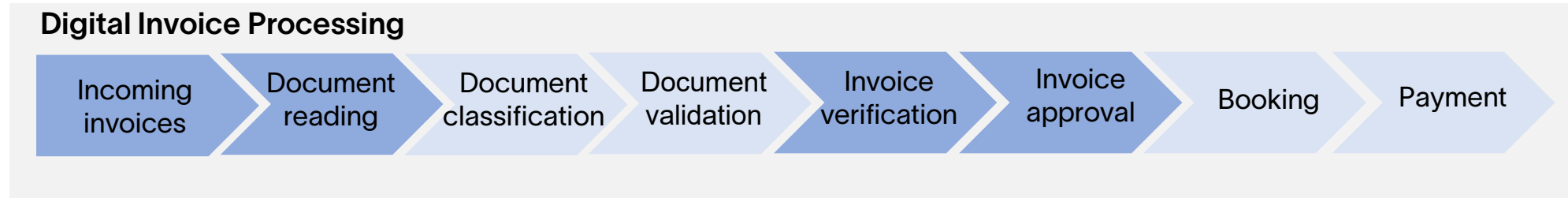


# 3. Purchase-to-pay or Invoice-to-pay Process without Digitalization



Sources: modified from Diehm & Benzinger, 2018, p. 842

## 4. Invoice-to-pay Process after Digitalization



Assessment of the future by the Institute for Employment Research (IAB)

### Automatability in the occupation Accountant



As things stand today, all of the 7 core tasks in this occupation can be automated.

NOTE: The use of digital technologies often creates new opportunities. Task profiles are in change, occupations do rarely disappear completely.

This does not mean that your (desired) occupation will be automated actually. Human work can, for example, be more flexible, more economical or of better quality.

New technologies in your (desired) occupation

Sources: process modified from Diehm & Benzinger, 2018, p. 843; IAB, 2024a; see also Dengler & Matthes, 2018; Reuschenbach et al, 2020, p. 147

# 5. Effects and Status of Digitalization in Auditing

## Digitalization of the audit

- **Reduction** of audit effort for automated processes and process-integrated controls (fewer samples and a smaller sample size)
- **"Big data"** analyses of large volumes of data in a short period of time
- Stronger integration of data analytical procedures into the **risk-oriented audit approach**
- Audit of the **population** instead of sampling
- **"Continuous auditing"** enables time equalization
- ...

## Digitalization in the own practice

- Working papers generally only digital and (even) greater use of **mobile** devices
- Wide use of **cloud services**, **AI** is used selectively
- **"New Work"** - worldwide access to data possible
- Increasing **specialization**, esp. with regard to IT audits
- Creation of centralized / outsourced **shared service centers**
- ...

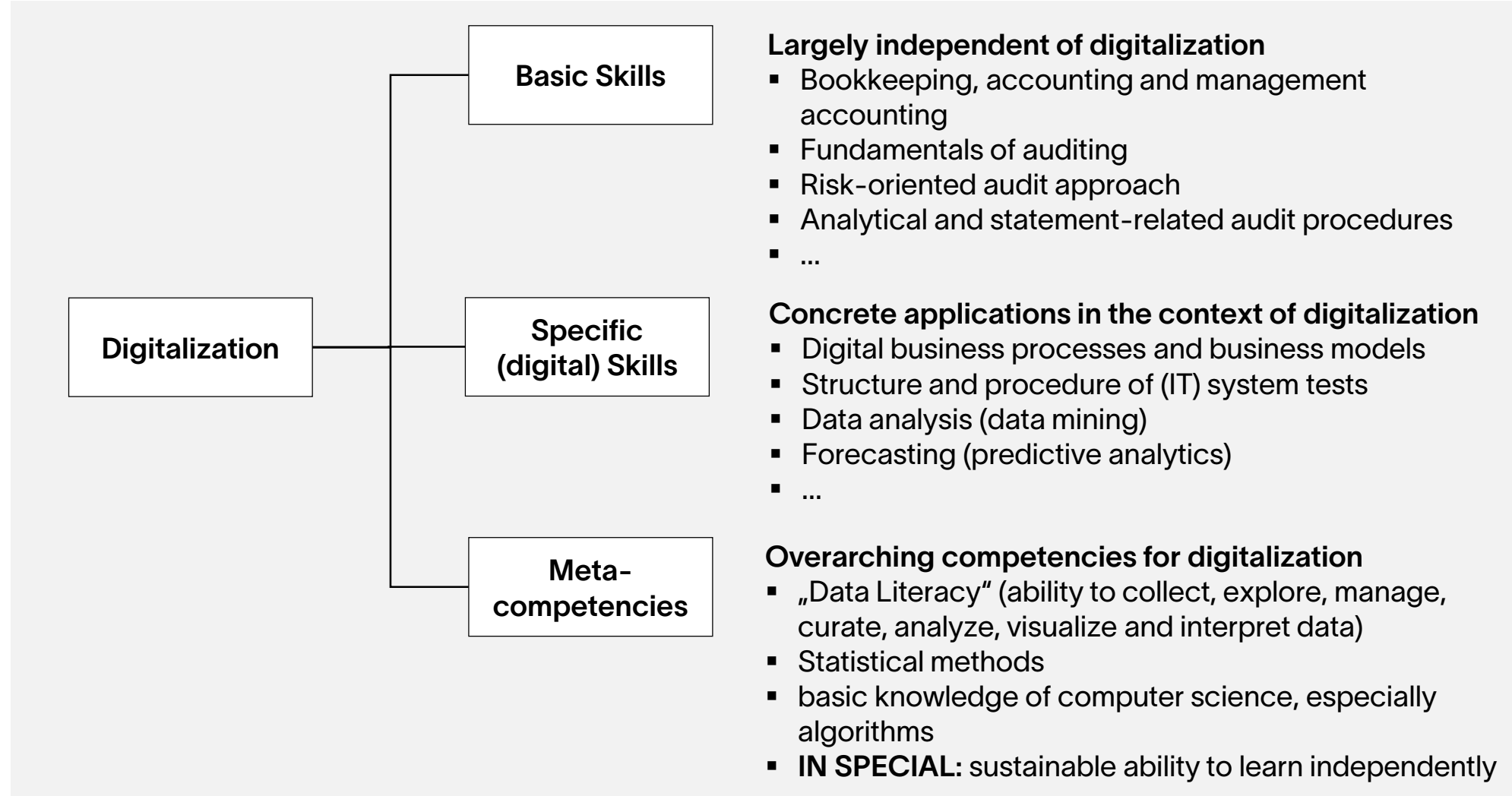
Automatability of auditing  
"only" 67 % according to IAB

## Opportunities for new services through digitalization

- **Support** with adjustments to clients' systems and internal processes
- Use of data analyses also for **business consulting** (weak points, visualizations, benchmarking)
- Auditing the regularity, security and compliance of **IT systems**
- Advice in the context of **outsourcing** / auditing the internal control system at service companies
- ...

Sources: Blum, 2020, p. 277; Boritz & Stratopoulos, 2023, p. 2; Bruckner, 2019, pp. 235, 242; Downar & Fischer, 2019, pp. 762, 763; Feld & Pöhlmann, 2017; IAB, 2024b; Langhein et al, 2018, p. 420-421; Marten & Harder, 2019, p. 767; Odenthal & Odenthal, 2023, p. 358; Weißenberger et al, 2019, p. 1121

## 6. Discussion: Impact on University Education



Sources: Bravidor et al, 2020, p. 293; Bruckner, 2019, p. 243; Kesten, 2019, p. 47; Klein & Küst, 2020, p. 94; Leitner-Hanetseder et al, 2022, 199; Marten et al, 2017, p. 1239; Stifterverband, 2024; Vanini, 2019, p. 59; Weißenberger et al., 2019, p. 1124

# 7. Conclusion

- **Routine** activities in accounting and auditing have been or are being **automated**. This is leading to a decrease in the quantity of manpower required while the quality of activities is increasing.
- Digitalization therefore appears to be a possible and **necessary strategy** for companies. This means that the demands on the **skills** of those working there (in the future) are **increasing**.
- Universities must not only react to digitalization, but **actively shape** it.
- Digitalization is not an end in itself - regardless of the progressive penetration, certain **basic skills** remain that must be taught.
- In addition, there should (also) be a focus on digitalization in the specialization modules (so-called "**hybrid knowledge**" or interface knowledge).
- However, certain **meta-skills** (especially in data analysis, statistics, computer science) can only be taught across modules or disciplines.
- Further development requires increased **cooperation** within and outside the university, as the skills are urgently needed in the practice of accounting and the auditing profession.
- **Skill-based recruiting** is another option, where relevant previous experience in accounting and auditing is dispensed with, thereby increasing the talent pool.

# References

- Bleiber, R. (2023, 6th November). Fachkräftemangel im Rechnungswesen. [https://www.haufe.de/finance/steuern-finanzen/fachkraeftemangel-im-rechnungswesen\\_190\\_606244.html](https://www.haufe.de/finance/steuern-finanzen/fachkraeftemangel-im-rechnungswesen_190_606244.html)
- Blum, A. (2020). Continuous Audit. In: Preus, P. (Ed.). Accounting und Taxation 4.0. Digitalisierung und Automatisierung im Rechnungswesen, 265-278
- Boritz, J. E., & Stratopoulos, T. C. (2023). AI and the Accounting Profession: Views from Industry and Academia. Journal of Information Systems. 37(3), 1-9. <https://doi.org/10.2308/ISYS-2023-054>
- Bravidor, M., Förster, G., & Weißenberger, B. E. (2020). Berufsstand 4.0: Wirtschaftsprüfer und Steuerberater zwischen Fachexpertise, IT und Datenanalyse. Ansätze für die Ausbildung künftiger Wirtschaftsprüfer und Steuerberater an Hochschulen und in der Praxis. WPg – Die Wirtschaftsprüfung, 73(5), 287-293
- Bruckner, A. (2019). Abschlussprüfung in der digitalen Welt – Prüfungsprozesse und Geschäftsmodell. In: Fink, C.; Kunath, O. (Eds.). Digitale Transformation im Finanz- und Rechnungswesen, Stuttgart: Schäffer-Poeschel, 235-249
- Demelius, K., Viveros, N., Herrmann, M., & Wolfsberger, J. (2023). Automatisierung und Digitalisierung im Rechnungswesen 2023. Eine Studie von Deloitte Österreich. Wien: Deloitte. <https://www2.deloitte.com/content/dam/Deloitte/at/Documents/presse/at-digitalisierung-im-rechnungswesen-2023.pdf>
- Dengler, K., & Matthes, B. (2018). Substituierbarkeitspotenziale von Berufen: Wenige Berufsbilder halten mit der Digitalisierung Schritt. IAB-Kurzbericht 4/2018, Nürnberg
- Diehm, J., & Benzinger, L. (2018). Digital Finance: Digitale Rechnungsverarbeitung und Workflows als Basis für ein Rechnungswesen 4.0. Der Betrieb, 74(15), 841-847
- Downar, B., & Fischer, D. (2019). Wirtschaftsprüfung im Zeitalter der Digitalisierung. In Obermaier, R. (Ed.). Handbuch Industrie 4.0 und Digitale Transformation -Betriebswirtschaftliche, technische und rechtliche Herausforderungen. Wiesbaden: Gabler Verlag, 753-779
- Feld, K.-P., & Pöhlmann, A. (2017). Digitalisierung. Eine Bestandsaufnahme für den Wirtschaftsprüfer. IDW Life, 04/2017, 356-362
- Hossenfelder, J. (2020). Audit 2.0 – Der Wirtschaftsprüfer der Zukunft. In: Preus, P. (Ed.). Accounting und Taxation 4.0. Digitalisierung und Automatisierung im Rechnungswesen, 241-246
- IAB (2024a, 12th January). Will Digital Technologies Change Your Job? Automatability in the occupation Accountant. <https://job-futuromat.iab.de/en/>
- IAB (2024b, 12th January). Will Digital Technologies Change Your Job? Automatability in the occupation Auditor. <https://job-futuromat.iab.de/en/>

# References

- Kampe, T. (2011). Führung von Wirtschaftsprüfungsgesellschaften: Intellectual Capital als Rahmenkonzept des strategischen Managements in Professional Service Firms. Wiesbaden: Gabler Verlag. <https://doi.org/10.1007/978-3-8349-6129-7>
- Kesten, R. (2019). Digitalisierung in Rechnungswesen und Controlling und ihre Folgen für die Hochschullehre: Chancen und Herausforderungen. *Controller Magazin*, 44(6), 44-49
- Klein, J., & Küst, C. (2020). Wie die Digitalisierung im Rechnungswesen die Aufgaben und Anforderungen an die Mitarbeiter/-innen verändert. In: Berding, F., Jahncke, H., & Slopinski, A. (eds) *Moderner Rechnungswesenunterricht 2020*. Wiesbaden: Springer VS, 83-97. [https://doi.org/10.1007/978-3-658-31146-9\\_5](https://doi.org/10.1007/978-3-658-31146-9_5)
- Kreher, M., Eichner, V., Sellhorn, T., Hess, T., & Köster, A., Weiß, K. (2021). *Digitalization in Accounting 2021 Study*. Berlin: KPMG. <https://hub.kpmg.de/digitalization-in-accounting-2021>
- Kreher, M., Winkler, M., Sellhorn, T., Hess, T., & Köster, A. (2022). *Digitalization in Accounting: 2022/2023 edition*. Study. Berlin: KPMG. <https://hub.kpmg.de/digitalisation-in-accounting-2022>
- Kreher, M., Winkler, M., Sellhorn, T., Hess, T., Sehn, V. & Meythaler, A. (2024). *Digitalisierung im Rechnungswesen. Studienausgabe 2023/2024*. Berlin: KPMG. <https://hub.kpmg.de/de/digitalisierung-im-rechnungswesen>
- Langhein, J., Kiesow, A., Strobel, C., & Thomas, O. (2018). Digitale Wirtschaftsprüfung – Make or Buy? *HMD*, 55(5), 412-426. <https://doi.org/10.1365/s40702-018-0408-8>
- Leitner-Hanetseder, S., Eisl, C., Knoll, C., & Koislgruber, M. (2022) Neue Berufsfelder im Rechnungswesen: Die Stellenprofile des Business Data Analyst und Business Data Scientist. *zfo - Zeitschrift Führung und Organisation*, 91(3), 198-203
- Marten, K.-U., Czupalla, K., & Harder, R. (2017). Digitalisierung in der Wirtschaftsprüfung und in der Internen Revision. Herausforderungen für die Aus- und Weiterbildung, *WPg – Die Wirtschaftsprüfung*, 70(21), 1233-1241
- Marten, K.-U., & Harder, R. (2019). Digitalisierung in der Abschlussprüfung. Experteninterviews auf explorativer Basis, *WPg – Die Wirtschaftsprüfung*, 72(14), 761-769
- Mujkanovic, R. (2014). Warum merkt nur keiner, wie toll der WP-Beruf ist? Weshalb eine Imagekampagne allein nicht ausreichend ist. *WP-Praxis*, 3(1), 23-25
- Odenthal, R., & Odenthal, K. (2023). Mehr als ein neues Werkzeug. Generative KI-Techniken (ChatGPT) in der Prüfung. *WP Praxis*, 12(12), 358-367

# References

Prümm, D., Loitz, R., & Dittmar, H.-P. (2023). Digitalisierung im Finanz- und Rechnungswesen 2023 – und was sie für die Zukunft der Abschlussprüfung bedeutet: Befragungen zum Status quo und zur digitalen Weiterentwicklung. Frankfurt am Main: PricewaterhouseCoopers.  
<https://pages.pwc.de/digitalisierung-im-finanz-und-rewe-2023>

Reuschenbach, D., Beuckes, T., & Isensee, J. (2020). Intelligente Prozessautomatisierung im Accounting. In: Preus, P. (Ed.). Accounting und Taxation 4.0. Digitalisierung und Automatisierung im Rechnungswesen, 131-150

Stifterverband (2024, 14th April). Data Literacy Education. <https://www.stifterverband.org/data-literacy-education>

Vanini, U. (2019). Wie viel „Digitalisierung“ lernt man an Hochschulen? Controlling & Management Review, 63(6), 58-63

Weißberger, B. E., Förster, G., Wesser, M. B., & Bravidor, M. (2019). Wohin führt die Digitalisierung? Auswirkungen auf Wirtschaftsprüfung, Steuerberatung, Finanzfunktion und Hochschullehre. WPg – Die Wirtschaftsprüfung, 72(20), 1118-1124





**Thank you for your attention,  
questions and comments are very welcome!**

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# *COFFEE BREAK*

**14:40-15:00 Uhr**

# DISCUSSION FORUM WITH ALL PARTICIPANTS AND BRIEF SUMMARY

**15:00-15:45 Uhr**

## *EVALUATION*

! **Please participate:** The evaluation takes only 5 minutes!



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# AWARDING THE TWO BEST PAPER

15:45-16:00 Uhr



- Best Paper BiCAB 2023:** (from left) Prof. Dr. Ela Sibel Meydanoglu and doctoral student Ferhat Sayin from the Turkish German University and by Prof. Dr. Manuel Stegemann and doctoral student Eliza Starke from the HSBI



**Thank you for being here!!!**