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Abstract Booklet

Panel 1 - Educational decisions over time	2
Panel 2 - Motivation and competence in higher education	4
Panel 3 - Motivation and competence in higher education Transition of migrant youth to upper-secondary education	7
Panel 4 - Academic careers	10
Panel 5 - Challenges in mixed methods research	14
Panel 6 - Visual data in mixed methods research	17
General reflections on mixed methods research	18
Panel 7 - Inequality and inclusion in children's education	20
Panel 8 - Diversity and social justice in higher education	23
Panel 9 - Mixed method vignette studies	27
Panel 10 - Getting ready for higher studies	31
Poster Presentations	34

Panel 1 - Educational decisions over time

When dreams (do not) come true: mixed- methods longitudinal research on young people's aspirations

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At the end of secondary general track schooling, young people experience an important transition; in Austria, they have to decide on further schooling or vocational training. Aspirations shape this transition and decisions herein. In this contribution, we explore patterns in formation, change or stability of educational and occupational aspirations.

In an analysis of three waves of standardized and qualitative interviews with independent samples, we explore young peoples' transitions from the lower secondary school. The core interest lies in the formation and embeddedness of educational and occupational orientation within participants' lifeworlds and progress over time. The exploratory longitudinal mixed-methods approach is based on adolescents attending Neue Mittelschule in Vienna, aged about 14 years in wave 1. Initially, separate analysis intertwined with joint interpretations and further data exploration leads to a circular analytical process. With qualitative longitudinal analyses, we developed a typology of young people's educational and occupational orientation processes over time. In a statistical analysis of three waves of the panel survey data with the same age group, we compare and integrate findings on stability and change of aspirations and analyze the influence of sociodemographic characteristics on these patterns. We integrate quantitative results on patterns of time for sub-groups and thematic analyses as well as case histories based on qualitative interviews. This exploratory longitudinal mixed methods research helped to untangle the multidimensional phenomenon of educational and occupational aspirations.

This example illustrates how MMLR can yield a more holistic, temporal and nuanced understanding of structure and agency. Based on our lessons learnt, we make suggestions for future research. MMLR has great potential but is comparatively rare, thus a fruitful area for future methodological research. More empirical best practice examples are needed.

Longitudinal mixed-methods analysis of tertiary students' study intentions

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Student dropout has been a matter of concern to educational policymakers and politicians since the establishment of formal education. Studies have succeeded in determining correlations between dropout and students' and institutions' background characteristics, while pedagogical and changeable factors have been lesser researched. This despite that Tinto's paradigmatic institutional departure model (introduced in 1987) proposes a correlation between dropout and students' institutional integration within a social and an academic system. Our theoretical origin is a newer revision of Tinto's model (Qvortrup & Lykkegaard, 2022) which adds a third institutional system 'teaching' to these two. Students' ongoing process of interacting with the three systems continually modify students' institutional integration and thus their study intentions (e.g., dropout considerations). To capture these ongoing interactions, we conducted a longitudinal study addressing the research questions:

- How does students' study intentions evolve over the course of tertiary education?
- What reasons for changes in study intentions can be found in students' accounts of teaching, the social and the academic system?

For answering the first research question, we collected longitudinal survey and register data from all students at Humanities at University of Southern Denmark matriculating in 2017-2019 half-yearly until they were no longer enrolled (i.e., graduated or dropped out). Register data included students' study progression (i.e., dropped out, enrolled, graduated) and surveys included scales addressing students' dropout intentions, and perception of the three institutional systems. Changes across time in students' study intentions are visualized using Sankey diagrams. Regression analysis was conducted to illustrate the relationship between study intentions and the three institutional systems (controlling for background variables).

For answering the second research question, 14 students were individually interviewed half-yearly throughout tertiary education. Each interview followed threads from previous interviews regarding students' accounts of their study intentions. Interviews were analyzed according to students' reasons for study intention changes, with a particular interest in the institutional systems.

We conduct mixed-method research to understand dropout in-breadth and in-depth. Our approach is, quantitatively variable-oriented (with a focus on study intention changes) and qualitatively case-oriented (with a focus on students' narratives). The study employs data integration (participants in the qualitative part are a subsample of the quantitative participants) as well as interpretation integration as narrative joint displays (see below).

Results are represented corresponding to the two research questions. First, we present the student cohorts' dynamic study intentions (quantitative) and illustrate narratives within different major paths (qualitative). We illustrate pathways for one student that graduates, one that drop out and one that shifts to another tertiary education. Second, we present results from regression analysis (quantitative) showing to what extent we can predict students' study intentions from their perception of the three institutional systems, finally we show how the three systems affects the above students' narratives (qualitative).

Qvortrup, A., & Lykkegaard, E. (2022). Study environment factors associated with retention in higher education. *Higher Education Pedagogies*, 7(1), 37-64.
Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*: ERIC.

Panel 2 - Motivation and competence in higher education

Mixing digital behavioral data, survey data and a qualitative panel: understanding learning behavior and motivation from three angles

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Why are the motivated the successful in our classes? How does motivation change (due to learning successes)? And how can student motivation be consciously changed to take advantage of this relationship? These and similar questions were investigated in a research project using the example of a statistics course for bachelor students in the social sciences. The digital behavioral data from the learning app used in the course are available of 703 students for this purpose. The students were also asked to participate in a survey at four points in time and it is possible to match some register data from the university IT. This creates a research setting that first combines different quantitative data forms and approaches of analysis. At the same time, 14 of the students participated in a qualitative interview panel with four measurement points.

Using expectancy value theory (EVT) and control value theory (CVT) and these data collections, it could be shown that motivated students are somewhat more engaged in learning, but also distribute their learning better, which is a successful learning strategy. In addition, the high school grade point average reveals a partial spurious correlation between motivation and learning success. Moreover, student motivation at the end of the course is more predictive of success than motivation at the beginning of the course. In the qualitative analysis of the development of motivation, case studies and qualitative content analysis show that the value assigned to the learning object statistics has the highest

importance and varies differently in different sub-dimensions. This way, it can be shown that teachers can influence the learning success of their students both in the meta-control of the learning processes and via meta-communication on the learning object.

In the presentation, the conducted research and its results will be briefly presented and discussed. In particular, however, the added value of the different forms of data used will be highlighted. The focus will be on the linking of the data. While the different quantitative data sources could be linked on an individual level, this was not the case for the qualitative data. The presentation will highlight which insights can nevertheless be gained from the mixture of methods and discuss what additional information a linkage of the qualitative data with the quantitative data could bring.

Communicative competences in higher education management: results from a German mixed methods project

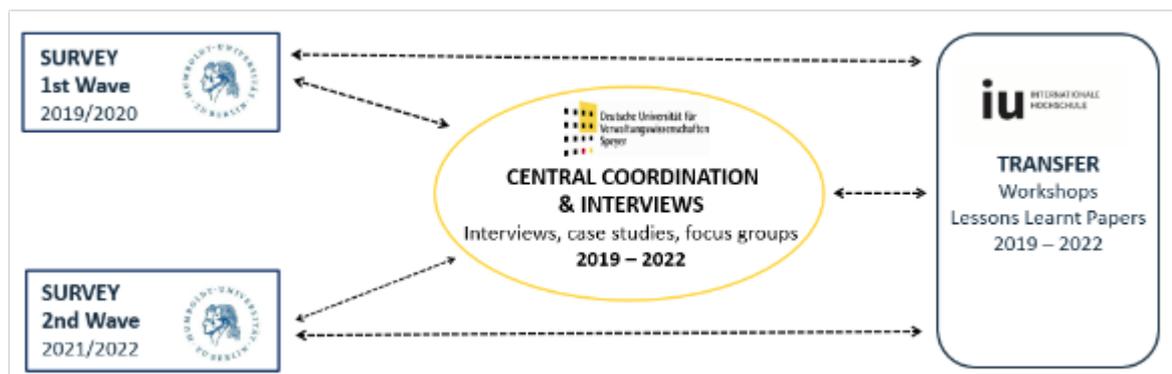
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In many countries, higher education (HE) managers represent an important and well-established group of staff (Kerridge & Scott 2018). In Germany, however, they belong to a group still in a process of development and growth (Kehm 2013, Krempkow et al. 2021). Therefore, in Germany along with other European countries, qualifications and careers of HE managers are not yet strictly defined and are rather diverse.

The project KaWuM – Career Paths and Qualification Requirements in Higher Education Management - was a collaborative three-year research project funded by the German Federal Ministry of Education and Science (BMBF) from 2019 to 2022 that collected data on career paths, competences, qualifications, perceived professionalisation and organisational development by using a multi-step mixed-methods approach (Kelle 2019). First, a large quantitative online-survey (N=1.380) was carried out. Second, these quantitative results were complemented by qualitative methods including interviews, focus groups, case studies and institutional documentary research exploring HE management in greater detail to deepen and better understand individual results. In the third phase, a second survey (N=1.236) took up questions from the first survey allowing for a longitudinal and even panel observation, but also added questions originating from the qualitative results (Legewie & Tucci 2016). The whole process was supported by transfer workshops in which results from both data sources were discussed and validated by practitioners from the field.



In this paper, we explore one particular aspect of our findings. Using the analysis of required communicative competences in German HE management, we aim to exemplify a successful mixed methods research approach. In the first wave of the online-survey, respondents were asked to rate the extent to which 40 different competences were required in their current job – some of them stemming from the area of communicative competences. In the subsequent qualitative interviews, participants were also asked which competences were particularly important to their areas of employment. Communication was mentioned most frequently in the interviews. In 197 paragraphs nine different aspects of specific communication requirements in HE management could be identified from the transcripts. The insights into the specific communicative qualification requirements gained through the interviews were integrated into the extensive item battery in the second survey wave, so that this was expanded by five items relating to the special communication competences in HE management. The extraction from the interviews was approved in the second survey: these items received high and very high consent and also correlate highly. This shows how theory-building and diverse data sources can mutually improve each other (Hoelscher 2017).

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Panel 3 - Motivation and competence in higher education Transition of migrant youth to upper-secondary education

Overcoming the limitations of quantitative research: discrimination in transition to vocational education and training (VET)

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Many young migrants experience unequal opportunities in Germany (El-Mafaalani, 2018, p. 102f). Vocational education research has so far focused in particular on statistical discrimination, while there is a lack of empirical studies in the educational context with regard to subjective experiences of discrimination from migrants' perspective (Horr et al., 2020, p. 5). Subjective experiences do not necessarily coincide with objectively measurable inequalities (Ette et al., 2021, p. 28; Straub et al., 2021, p. 143). For those affected, the experienced situation is usually more important than the actual discrimination (Ette et al., 2021, p. 28).

Based on these considerations, the quantitative study to which this contribution refers examines the differences in adolescents' perceptions of personal discrimination according to ethnic group membership. The aim is to answer the question of how young people's perceptions of personal ethnic discrimination differ according to their group of origin. Logistic regression models and marginal effects were calculated using data from Starting Cohort 4 of the National Educational Panel Study¹ (N = 1,421). The results show that Turkish migrants (N = 307) perceive more personal discrimination when looking for an apprenticeship position than Polish (N = 131), ex-Yugoslavian (N = 141), and ex-Soviet (N = 296) adolescents. Furthermore, there is a greater gender difference in the Turkish group than in the other groups of origin, which is not significant but noticeable.

This purely quantitative approach has some important limitations, which are typical of the limitations of many studies using secondary data sets such as the NEPS. In our presentation, we will discuss these limitations, as well as related opportunities to extend the study in a mixed methods approach, on three levels:

(1) Theory: At the individual level of perceived discrimination, there is currently a lack of theories that could be explored using a qualitative approach. Qualitative research methods that aim to enrich and generate theory are particularly suited to this purpose. An example of this is the documentary method, which explicitly aims to generate theory (Bohnsack, 2014, p. 32).

This paper uses data from the National Educational Panel Study (NEPS; see Blossfeld & Roßbach, 2019). The NEPS is carried out by the Leibniz Institute for Educational Trajectories (LifBi, Germany) in cooperation with a nationwide network.

(2) Operationalization: Given the original research question of how young people perceive discrimination, the operationalization in the NEPS data seems rather vague. Various questions arise: Are the items suitable for getting an idea of perceived discrimination? What is actually being asked and does it interfere with other aspects? All in all, the question is: Do the available variables allow to say something about the actual question asked? In other words, is there a match between the research question and the variables available. In a secondary analysis it is not possible to change the operationalization, but it is possible to identify existing difficulties. This is a typical issue when working with secondary data sets, which is often mentioned in the limitation of secondary data. Qualitative analyses allow us to think further at this point. Once the limitations have been identified, in-depth analyses (including standard methods such as thinking aloud) can be used to explore what the question represents, what needs to be taken into account in future operationalization, and so on.

The NEPS can serve as an example of how researchers can get an overview of the theoretical background of items, find appropriate items, and help design questionnaires. Qualitative approaches open up the possibility of widening the view once it has been narrowed down to one variable. This can also be used to explore the extent to which other datasets (e.g. ADIAB data from the IAB for income or labor market data from the SOEP), might be more appropriate and could be used.

(3) Results: Based on the results, substantive tracks can be found that can be pursued further and are interesting for mixed-method approaches. In the sample study, especially the role of gender and more precise information on the perception of discrimination that goes beyond the frequency of occurrence are clues for further research. At this point, qualitative data can provide in depth perspectives or even complementary insights. In this way, the quantitative study provides an insight that is reduced in complexity and reveals patterns and striking aspects that can then be explored in greater depth in the qualitative studies.

This contribution reflects on the chances and limitations of quantitative research, especially with secondary data sets, on perceptions of discrimination in the transition to VET, discusses remaining questions to be tackled and suggests the potential of mixed methods approaches on three levels.

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Immigrant youth's transition into upper secondary education in Austria: a mixed-methods analysis using register data and qualitative interviews

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Moving from lower secondary into upper secondary education marks a decisive transition in young people's educational trajectories. Attributed primarily to a so-called immigrant optimism (Kao & Tienda 1995), previous studies find that students with an immigrant background are more likely to pursue academic tracks rather than entering the vocational education and training (VET) system compared to their native peers, once socioeconomic status and prior school achievements are accounted for (Dollmann 2017; Tjaden & Hunkler 2017; Tjaden & Scharenberg 2017). However, further research is needed to develop a better understanding of how and why such ethnic choice effects might vary between different groups of students with an immigrant background and depending on the context in which educational choices are made.

The central interest of this doctoral research project is to analyse the explanatory mechanisms and decision-making processes underlying differences in youth with an immigrant background's transition rates into upper secondary education in Austria. Characterised by its strong and differentiated VET sector comprising several types of company-based and school-based VET options at the upper secondary level, Austria's stratified education system is a particularly interesting case for this analysis (Dorninger & Gramlinger 2019; Lassnigg 2016).

The first pillar of the empirical research design is a quantitative analysis based on a longitudinal dataset that integrates various administrative registers to cover the educational trajectories of a full cohort of students. Making use of this rich data, pathways into and through upper secondary education will be mapped using sequence analysis. Building on these descriptive results, multi-level regression analysis will be performed to investigate to what extent individual factors (e.g., parental education, gender, and country of origin) as well as school-level and regional context variables can explain differences in immigrant students' transition patterns into and through upper secondary education.

In a subsequent qualitative study, problem-centred interviews will be conducted with immigrant students in the final year of their compulsory education as well as significant others (e.g., teachers, counsellors, and parents) involved in these students' educational decisions. A thematic analysis of the qualitative interview material will focus on the perceived barriers and aspirations that drive immigrant students' decision-making between different general or vocational upper secondary education tracks.

This doctoral research project relies on a mixed methods approach for the purpose of complementing and enhancing the results from one method with another (Bryman 2006; Greene et al. 1989). Based on a high number of cases and extensive information provided through register data, the quantitative analysis will reveal differences in immigrant students' transition patterns and generate empirical knowledge on a complex interplay of different explanatory variables. Following a sequential mixed methods design (Kuckartz 2017), these quantitative findings will guide the design and sampling strategies of the qualitative study, which will yield deeper insights into how and why educational choices are made from the perspectives of immigrant students and the people involved in their educational transitions.

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Panel 4 - Academic careers

Am I too old? Motives and perceived ageism in the “race for tenure”.

A mixed-method pre-study for an upcoming grant proposal

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Research topic and project context

Pursuing research as a profession should be marked by universalism and not depend on a scholar's personal or social attributes, such as gender, nationality, religion, or class membership. Research shows that women and scholars with a migration background often find it hard to succeed, whereas, surprisingly, a scholar's age is a seldom researched topic. It should be noted that, besides one's

chronological age, every Ph.D. graduate also has an academic age; that is the time that has passed since the attainment of the Ph.D. A scholar's academic age is not mandatorily linked to chronological age, making it possible that two Ph.D. graduates have the same academic age, but were born years apart. When looking at chronological age as a source of unequal treatment in labour markets ('ageism') (Butler, 1969), a rich body of research can be found (Naegele et al., 2018, 2020). Nevertheless, it hasn't been explored much in the context of the so-called "race for tenure".

Specification of the research question

The effects of ageism on the individual are well documented, especially with regard to motivation (Rothermund et al., 2021) and career development (Swift, 2017). Ageism can reduce job satisfaction and undermine people's motivation to depart on or stay in career tracks, which are perceived to be reserved for a specific age group. The latter relates to chrononormative expectations of what career (step) is appropriate at what age and which competencies are assigned to a specific age group. Paradoxically, although a higher age is generally associated with a higher level of competency, scholars who finish their Ph.D.s in their 40s are often viewed as too old to start a research career afterward (Ordemann & Naegele, forthcoming). As discrimination based on age can comprise all kinds of practices and institutional structures, some more obvious than others, being exposed to ageist stereotyping could affect one's motivation to stay in academia, ultimately hampering with career advancement. Against this background, the following research questions arise:

Research Questions:

- 1a) What are the motives to start and stay in a scientific career?
- 1b) How was this affected by perceived age discrimination?

Motivation for mixed methods research

The paper builds upon and extends findings from a recently accepted research article², that compare paths into tenure of younger Ph.D. graduates to those 40 years and older, using data from the DZHW Ph.D. Panel 2014. We find that Ph.D.s aged 40+ achieve tenured position faster than their younger counterparts, but they do so in different positions (e.g. University of Applied Science instead of University). To further investigate these age group specific differences and since the DZWH Ph.D. Panel does not enquire further about experience made with ageist stereotyping and/or unequal treatment based on age, a qualitative exploration of the role that chronological age might play in the "race for tenure" appears necessary. The pre-study, which we will present in Hannover, focusses on scholars' motives to pursue, and stay in a scientific career and can be understood as preliminary work for a grant proposal, planned for 2024.

Data and methods (with an emphasis on how and why data, methods, and results are integrated)

The pre-study utilising sequential explanatory mixed method design (quant → qual), which will be explained in more detail in the following.

² Ordemann, J. & Naegele, L.: Forty and over the academic hill? Biological and academic age and the race for tenure. *Soziale Welt* (forthcoming).

Quantitative Study:

The objective of the quantitative study is to further investigate the motive to pursue a Ph.D. and to remain in science afterward for Ph.D. graduates aged 40 years and older compared to those who are younger. Based on data from the DZHW Ph.D. Panel 2014 we first estimate multinomial logistic regression on a battery of motives why a person chooses to attain a Ph.D. followed by logistic panel regressions on how the motive to remain in science changes over time. Our analyses are adjusted by gender, migration background, Ph.D. grade, and academic productivity factors. Preliminary findings show that older Ph.D. graduates have a stronger motive to remain in science: Although both groups adjust their motives over the time that they remain in science, older Ph.D. graduates retain stronger motives than younger ones.

Qualitative Study:

The subsequent qualitative study applies focus group interviews, with scholars who received their Ph.D. after forty years of age and now work in academia. For the initial focus group (F1), which is planned for early September 2023, a snowball sampling was implemented to recruit 5-7 participants. The interview will be recorded, transcribed, and analysed using qualitative content analysis (Kuckartz, 2014, 2018) and the MAXQDA programme. The results of the quantitative study will inform/be integrated in the interview guideline of the focus group.

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Scientific mentoring for early career clinician scientists: the mentors' and protégés' perspective on mentors' roles and functions

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While mentors can have positive impacts on their protégés, the benefits of mentoring depend on the roles and functions mentors fulfil (Bäker, Muschallik & Pull, 2018; Kram, 1985; Long & McGinnis,

1985). One influential theoretical concept differentiates between career functions and psychosocial functions of mentors – two dimensions that have been tested and supported empirically with the Mentor-Role-Instrument (MRI) (Ragins & McFarlin, 1990; Schneider, 2009) (cf. Table A1). Career functions serve the purpose of preparing and assisting protégés in their professional growth, e.g., through coaching or sponsorship. Psychological functions focus on enhancing protégés' self-confidence and identity in their professional role, e.g., by assuming the role of friends or parents (Kram, 1985).

Although data suggests that mentoring plays a crucial role in academic careers (e.g., Epstein & Elhalaby, 2023; Meschitti & Lawton Smith, 2017; Muschallik & Pull, 2015; Schriever & Grainger, 2019), the MRI has been only applied in a few higher education settings. We combine quantitative and qualitative research methods to a) gain a deeper understanding of mentors' roles and functions of the MRI for the specific mentoring setting of academic medicine, and b) to contrast mentors' and protégés' perspective on mentors' roles and functions.

Our data stems from an evaluation study of programs at a large university hospital in Germany that support early career scientists, who intend to pursue a double career as both physician and scientist (“clinician scientists”; Hendriks, Simons, & Reinhart, 2019; Vignola-Gagne, 2014). The programs include mandatory mentoring by at least two mentors. We collected survey data from the participating protégés (N=40) using the MRI (Ragins & McFarlin, 1990; Schneider, 2009) and additionally interviewed a selection of their scientific mentors (N=11). In the interviews, the mentors were asked to rank the mentoring roles and functions (cf. Table A2) according to their perceived importance. The interviews were analyzed following Kuckartz's qualitative content analysis (2016, 2019). For the quantitative survey data, we carried out descriptive analyses of protégés' responses to the MRI.

The results indicate that there is a high degree of similarity between mentors' perceived importance of mentoring roles and the roles protégés' reported that their mentors actually fulfil. Both career and psychosocial functions were perceived as important for mentoring early career clinician scientists, however some roles appeared to be crucial, e.g., assigning challenging tasks and acting as a coach (career functions) and providing acceptance and counseling (psychosocial functions). While many roles of the MRI were supported, some of the functions were perceived as less important by the mentors. This applied particularly to the psychosocial function “social” (i.e., joint social activities) and “parent” (i.e., taking on a parental role). While some protégés also gave high ratings for these two functions in the online survey, they overall received the lowest average approval. Our findings suggest that incorporating the perspectives of mentors and protégés contributes to a deeper understanding of how mentoring is conducted and what roles and functions mentors should focus on when mentoring early career (clinician) scientists.

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Panel 5 - Challenges in mixed methods research

The need for a complex mixed methods approach and the associated pitfalls: a discussion based on a project on the implementation of the structured doctorate in Austria

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In this proposal, we present a MM-study to discuss the opportunities, limitations, and pain points in conducting a MM-study and data integration. The study deals with the implementation of the structured doctorate at Austrian universities (project runtime: December 2022-October 2023). The aim of the study, funded by the Austrian ministry for education, science and research (BMBWF) is to derive recommendations for the qualitative expansion of structured doctoral training.

We aim to answer: What has changed quantitatively and qualitatively in the doctorate as a result of the measures introduced? To what extent has structured doctoral training been adopted for all doctoral studies and where are the universities currently on the way to a comprehensive implementation of structured doctoral training and in which direction should further development be pursued?

In order to be able to map the current state of implementation, a complex mixed methods design was developed, which is composed of parallel and explanatory sequential designs (Guetternan & Fetter 2018; Leech & Onwuegbuzie, 2009; Teddlie & Tashakkori, 2011; Timans, Wouters & Heilbron, 2019), including the following methods:

(1) **Desk Research:** All documents relevant to the topic – from the Austrian and the European context – are evaluated.

(2) **Data from uni:data.** Uni:data is a platform, hosted by the BMBWF, that collects data reported by public universities, such as the number of students, number and type of employees, etc. Indicators of the strategic goal setting of doctoral studies, such as degrees and duration of study by the Ministry, are analyzed for our study.

(3) **Data from the APIKS Austria project** (<https://www.donau-uni.ac.at/apiks>): This is a secondary analysis of data from N = 1,029 doctoral students who was collected in 2021 within the international study APIKS (The Academic Profession in the Knowledge Society) and provided information in relation to their doctoral studies, working conditions and career related aspects.

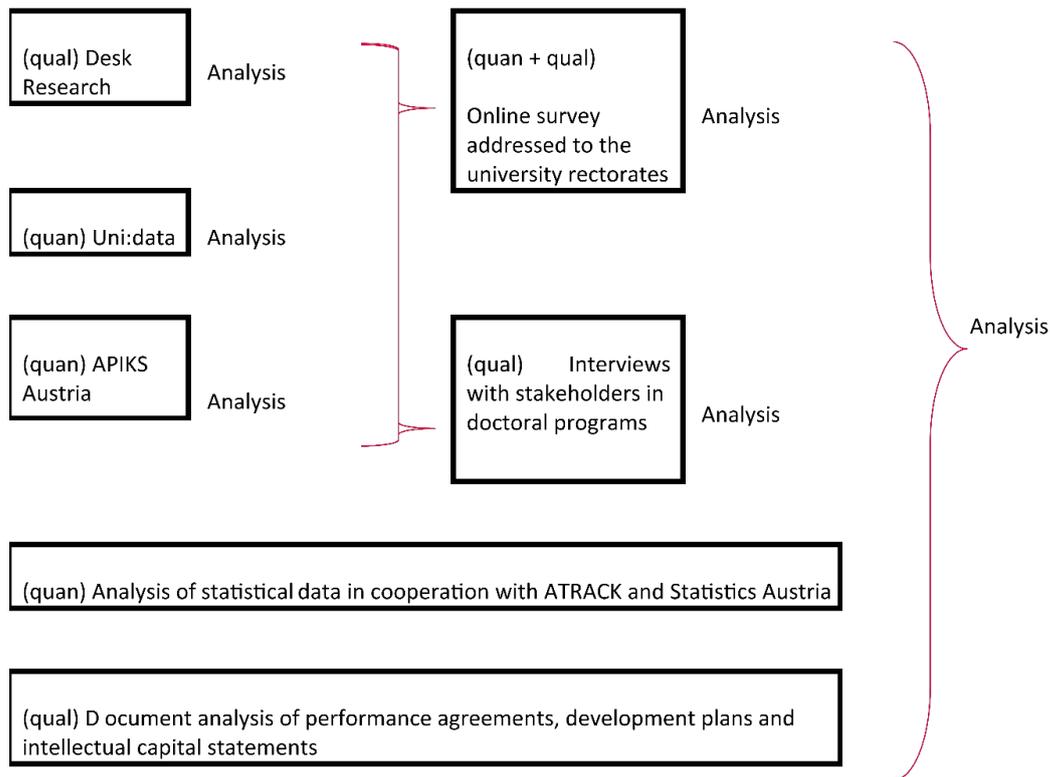
(4) **Online survey addressed to the university rectorates:** It summarizes the implementation of the further development of the doctoral studies and answers the question to what extent the structured doctoral training was implemented for all doctoral studies.

(5) **Document analysis of performance agreements, development plans and intellectual capital statements:** Statements on plan initiatives, objectives and implementation results with regard to doctoral studies are examined with text mining.

(6) **Interviews with stakeholders in doctoral programs:** Qualitative semi-structured interviews with stakeholders in five structured doctoral programs are carried out in order to get a comprehensive picture of doctoral training.

(7) **Career data in cooperation with ATRACK/Statistics Austria:** The ATRACK (graduate tracking) project was developed jointly by all public universities and offers the possibility of statistically evaluating the career start and career progression of graduates and university dropouts and gives us the opportunity to follow the career of doctorate graduates.

The following graphical representation illustrates the design:



The approaches differ in terms of the kind of data collected and the methods of analysis. We will discuss the design as an example on how different methods work together to create “a whole picture”, but also cause problems of data analysis and data integration due to the different nature of data and the different target groups and time perspectives addressed.

APIKS Austria – The Academic Profession in the Knowledge-Based Society. Online: <https://www.donau-uni.ac.at/apiks>

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Panel 6 - Visual data in mixed methods research

Using deep neural networks, qualitative content analysis, and multiple factor analysis to analyze the visual embedding of different (minority-) groups in Youtube videos of US-universities

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University of Kassel

Mixed methods approaches are employed in higher education research, for instance, to examine the association between material resources, university rank, and covered research topics (Beyer 2021; Wieczorek et al. 2023), student learning strategies and student success (Biner et al. 2020), or the experiences of disadvantaged social groups on campus (Goldberg et al. 2019; Johnson and Strayhorn 2022). Most often, the focus of these studies is on the integration of qualitative approaches rather than on the combination of qualitative and quantitative methods. In this context, the database comprises mostly of text as data, such as interviews or documents, while visual forms of data, like images or videos, remain largely unused.

This is even more surprising given the fact that the so-called "visual turn" has already been proclaimed in institutionalist-oriented organizational research (Drori et al. 2016; Boxenbaum et al. 2018). Against this backdrop, the contribution at hand addresses this research gap by exploring how videos can be incorporated into mixed-methods higher education research. To this end, the paper examines 450 Youtube promotional videos from U.S. universities. More specifically, the contribution addresses the following research questions:

1. To what extent are different minorities (e.g., African Americans) portrayed separately by gender at universities of different rank?
2. In what situations (e.g., research, teaching, sports, party life) are different groups embedded in the videos?

In order to answer these questions, the project firstly relies on Convolutional Neural Networks (RetinaFace and DeepFace) for face-recognition and the extraction of information on gender and ethnicity in the university Youtube-videos. Second, deductive qualitative content analysis (Schneijderberg et al. 2022, 120-142) is employed to encode the situations and objects depicted. A resolution of one frame per second for a maximum of sixty seconds per video is chosen, resulting in a corpus of approximately 20000 videoframes. Finally, the video information is brought into dialogue with data on university level using multiple factor analysis (Escofier and Pages 1994). This includes financial endowment, student body composition, and faculty, as well as research profiles extracted from Web of Science data using PCA.

Preliminary results indicate that in the videos of high-ranking elite universities, predominantly white males (and in some cases females) dominate in research contexts, while minorities remain primarily in the role of face for students on campus and in recreational activities. For mid- to lower-ranked universities, the composition tends to become more diverse, but focuses on seminar contexts for female faculty and on sports as well as campus recreational activities for minority members. Last, differences emerge in the representation of university buildings. Elite universities usually show aerial views of the campus and demonstrate their status through the architecture used, while other university types either lack this or focus on landscapes or urban centers in which the universities are located.

General reflections on mixed methods research

Validity criteria for mixed methods research: going beyond the combinatory approach

Judith Schoonenboom

University of Vienna

The current “combinatory” approach to mixed methods research design focuses on how to design various forms of “mixing,” that is, combinations of one qualitative and one quantitative research component. Here is an example:

[Part I] In a randomized controlled trial in primary schools in rural Kenya, Glewwe et al. (2009) found that providing textbooks did not raise the average quantitative test scores. Qualitative observations showed that textbooks did not have an effect because most children could not read their textbooks, which were in English, their third language.

Part I of this study fulfills current validity criteria for mixed methods research because:

- it has a rationale for combining qualitative and quantitative research components (Greene et al., 1989), namely, “using qualitative observations to explain the lack of a quantitative effect,”
- connects different qualitative and quantitative components: qualitative and quantitative methods are combined, as well as the conclusions from applying these methods (Teddlie & Tashakkori, 2009), and
- integrates quantitative and qualitative conclusions: because indicates that the qualitative conclusion forms an explanation for the quantitative conclusion (Bryman, 2007).

However, Part I suffers from an important problem: It is incomplete. Here is Part II:

[Part II] A reanalysis of the quantitative data showed that the textbooks did have an effect on students with high pre-test scores but not on the other students.

Part II shows that the real problem in Kenyan primary schools are unequal foreign language abilities and not a general inability of Kenyan primary school children to read their textbooks. Thus, without Part II, the example study would provide potentially misleading information to stakeholders and policymakers.

The reasons Part I is not identified as incomplete in the combinatory approach are directly related to its focus on the combination of qualitative and quantitative components. The analysis in Part II involves the creation, indeed the emergence, of two different perspectives: the perspective of students with high pre-test scores and the perspective of the other students. This happens within one quantitative data analysis. Such an analysis, however, is invisible to the combinatory approach, which focuses on combinations of one quantitative and one qualitative method. Consequently, the significant contribution of quantitative subgroup analysis within mixed methods research cannot be studied using the combinatory approach.

More generally, the combinatory approach cannot be used to investigate those important problems of mixed methods research design that are not directly related to combining qualitative and quantitative components. Furthermore, it cannot be used to investigate the generalizability of mixed methods validity criteria to multimethod research, which includes more than one qualitative or quantitative method, but not both.

In this presentation, I will introduce a developmental approach to mixed methods research design that focuses on development and emergence of research elements. I will show how validity criteria derived from this developmental approach will lead to different outcomes than current validity criteria, and have the ability to address the problems with the combinatory approach, including the incompleteness of Part I of the example.

Panel 7 - Inequality and inclusion in children's education

Researching processes of social inequality in early childhood education and care? Possibilities and limits of qualitative multilevel analyses

Sylvia Nienhaus

University of Bochum

Education is not only relevant upon entry into school, but already in kindergarten (AutorInnengruppe Bildungsberichterstattung 2022). This development can be seen in the legal framing of early education, which is intended to favour the targeted promotion of school-relevant competences (JMK, KMK & JFMK 2004-2022). Whether the focus on or promotion of early education in day-care centres can actually contribute to more equal opportunities or whether, for example, an individual attribution of (in-)competence by educators and a resulting unequal treatment of children (Nienhaus 2021) might not even have the opposite effect is the central question of my research project, which I am working on with a focus on social-emotional development - an area of pre-school competences that (with appropriate support) promises positive educational outcomes (Wiedebusch & Franek 2019).

Following a model of qualitative multilevel analysis (Hummrich & Kramer 2018), which focuses on hierarchical levels and their interactions and aims to capture multidimensional research phenomena by integrating different qualitative or even mixed methods approaches (Nienhaus & Stoltenhoff 2022), I conducted semi-structured interviews with representatives of educational service providers, educators and parents and participated in compulsory parent-educator meetings with regard to the educationally relevant development of 3- to 6-year-olds in Lower Saxony and Schleswig-Holstein. I analyse the data collected in this way in a content analytical, reconstructive way based on deductively as well as inductively generated categories (Kuckartz & Rädiker 2022) with regard to (non-)fit relationships of perspectives on education that are specific to educational service providers, educators and parents.

Initial results from the interviews with representatives of educational service providers (Nienhaus 2022) show that social-emotional development is seen as central to children's educational outcomes not only in research but also in practice. However, since social-emotional development appears to be difficult to grasp and has an impact on other areas of pre-school competences, the question arises as to how individual support can be provided here - a question that is not insignificant if one assumes that socio-cultural differences exist in social-emotional development (Bittlingmayer & Bauer 2008).

Against this background, I would like to present results from the mentioned mono-methodical (qualitative-reconstructive) project in my paper presentation, discuss to what extent it is possible to reconstruct divergent perspectives on education of representatives of educational service providers, educators and parents and how it is possible to set them in relation to each other with regard to (non-)fitting perspectives by means of qualitative multilevel analysis. Doing so I would like to show

that social inequality as a cross-level phenomenon, i.e. spanning the micro, meso and macro levels of society, seems to be particularly easy to grasp through qualitative multilevel analysis and can complement quantitative approaches to researching social inequality by focusing on social inequality processes (e.g. discrimination) productively linking determinants (e.g. migration background) and dimensions of social inequality (e.g. educational disadvantage) in order to explain social inequality (Solga, Berger & Powell 2009). Therefore, I would like to discuss mixed methods in educational research in my paper presentation by addressing the question if and how mixed or multi methods approaches could enrich a specific empirical analysis mentioned in the call for papers.

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A cross-cultural study of teachers' attitudes towards inclusive education for exceptional children between Poland and Indonesia: mixed method analysis

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Pedagogical University of Cracow

The teacher's attitude is the main factor in the success of inclusive education practices around the world. The current project focuses on teachers' attitudes toward inclusive education for exceptional children from a cross-cultural perspective. Inclusive education refers to the practice of ensuring that all students, regardless of their abilities, are given equal opportunities to learn and participate in school. This includes exceptional children, who may have disabilities or special needs. By examining the attitudes of teachers towards inclusive education for exceptional children, this project contributes to the larger discourse on disability and inclusion. It brings attention to the role that teachers play in shaping the experiences of exceptional children in school and the larger society.

The current study aims to (1) find the cross-countries differences between Indonesia and Poland in the level of teachers' attitudes towards inclusive education, (2) find the most important predictors of positive attitudes, and (3) make some practice recommendations for tertiary education in Indonesia to develop personal resources of students preparing for the teaching profession. The research questions are (1) Which independent variables are significantly related to attitudes toward inclusive education? (2) Which independent variables are the strongest predictor of positive attitudes toward inclusive education? (3) Which differences are related to differences in the national context? And (4) What suggestions can be given to prepare teachers' soft skills related to a positive attitude toward inclusive education?

This study includes 927 teachers from Indonesia and Poland using a mixed-method approach. This study utilizes the surveys such as the multidimensional attitudes toward inclusive education scale (MATIES), autism spectrum quotient (AQ), empathy quotient (EQ), and the Rosenberg self-esteem scale (SES). The semi-structured interviews have been conducted voluntarily for 27 teachers. Descriptive and inferential techniques were used to identify the correlation between teachers' demographic factors, such as teachers' school type, education background, gender, contact with disabilities, period of work, to their attitudes toward children with disabilities. For the qualitative aspect of this study, Reflective Thematic Analysis (Braun & Clarke, 2019) was employed to investigate aspects where the quantitative stage did not provide comprehensive insights into teachers' attitudes toward inclusion. This strategy facilitated a more profound understanding of teachers' attitudes and experiences dealing with inclusive education in both Poland and Indonesia.

The expected result will suggest to Indonesia and Poland prepare teachers with soft skills related to a positive attitude toward inclusive education. The research was reviewed and given a favorable opinion

by the Educational Research Ethics Committee, Institute of Psychology, Pedagogical University of Krakow.

Panel 8 - Diversity and social justice in higher education

Critical-reflective processing of diversity constructions in primary teacher education

Alexandra Madl

PH Tirol

The ongoing mixed methods research project is situated at the interface of intersectional, reflective gender and diversity research and higher education research. It is intended to provide information on how diversity (gender, race, class, ability, sexual orientation, care responsibility as an open list) among students, diversity-sensitivity and inclusion in primary teacher education are negotiated - in terms of educational policy, at university as an organization and at an individual level in the teaching and study life. Recommendations for development in primary teacher education should be derived.

The research process follows the idea of *Reflexive Diversitätsforschung* (Bührmann 2019, 2020, 2021), the essential part of which is a multi-method approach in order to do justice to the complexity of the research subject and the various perspectives associated. In this project the MMD opens up possibilities to address the micro, meso and macro level and considers the perspectives of several stakeholders (Bührmann 2020; Syed und Özbilgin 2009). It prevents a radical simplification of complex relationships, since it captures cross-context patterns as a variety of perspectives and complexity can be integrated (Greene 2005). Construction and design characteristics follow the discussions and explanations of Creswell und Plano Clark (2018) and Schoonenboom et al. (2018).

Quantitative data on the student population is available. The survey is based on *Studierendensozialerhebung* (Unger et al. 2019), DIVAL study (Beck et al. 2014), PISA study (Mang et al. 2019) and Human Values Scale HVS/ESS (Schwartz et al. 2015), parts of FIT-Choice scale (Watt et al. 2012) and COACTIV scale (Baumert et al. 2008). This submits data on conditions, recruitment methods, goals and beliefs about study and work, demographic data and social characteristics. Data management and evaluation are carried out with SPSS.

Qualitative data is generated in interviews: problem-centered interviews (Witzel 1985, 2000; Witzel und Reiter 2012) with students and expert interviews (Bogner et al. 2014; Meuser und Nagel 1991,

2010, 2013) with lecturers and leadership. Narrated practices and (participant) observations are collected as ethnographic data (Meyer 2022; Thomas 2019). For recommendations for university development in accordance with national and organizational strategies and concepts, documents as objectifications of practices (Hoffmann 2018), "die wiederum Praktiken anleiten oder verhindern sollen" (Bührmann 2020, S. 109), are analyzed.

Constructivist Grounded Theory methodology (Charmaz 2017a, 2017b; Charmaz und Belgrave 2019; Charmaz und Thornberg 2021) is used for evaluation of all qualitative data. Within the GT, Charmaz is characterized by the fact that she provides specific methodological suggestions for the analysis of different types of data. CGT is particularly useful for diversity research and questions of social inequality (Charmaz 2020), as it explicitly intends to "position research in relation to the social circumstances affecting it" (Charmaz 2011, S. 188). CGT draws on sensitizing concepts and disciplinary perspectives right from the start of the research project (Hohage 2016). Charmaz sees the research process as an interactive manufacturing process (Equit und Hohage 2016; Charmaz 2014), so to meet the demands of a reflective research approach (Mey und Mruck 2011).

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Inequalities in access to higher education from a comparative social justice perspective: a mixed-methods study

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This paper draws attention to the crucial importance of the social justice perspectives for understanding inequalities in access to and participation in higher education (HE). Social justice in HE has gained prominence among both researchers and policy makers mainly due to two worldwide trends – the massification of HE and its development as a key ‘player’ in contemporary knowledge-driven societies.

Against this background, the paper aims at providing refined theoretical and evidence-based insights into our understanding of social justice in HE. It conceptualises social justice in HE as a multi-dimensional phenomenon which is context and time-specific. Synthesising ideas from John Rawls’ (1999 [1971]) theory of ‘justice as fairness’ and Amartya Sen’s (1999; 2009) capability approach we argue that social justice regarding access to and participation in HE has a multi-dimensional character, and we define the most prominent of these dimensions to be the inclusion and fairness aspects, social justice for whom, social justice where, and social justice in relation to what (Boyadjieva & Ilieva-Trichkova 2021).

These theoretical conceptualisations are accompanied by empirical evidence for three of these dimensions – ‘inclusion of who’, ‘fairness for whom’ and ‘social justice in relation to what’. Empirically, we applied a mixed-methods approach, by combining latest available data from the European Social Survey, EUROSTUDENT, the Bulgarian University Ranking System, and qualitative data from in-depth interviews with students carried out in 2021-2023 in Bulgaria. We have used different types of measures in order to assess the three aspects of social equity in HE described above: index of inclusion in HE; index of fairness in HE, and complementary measurement of access in relation to what. To analyse the access in relation to what aspect, we applied one of the measures of social equity in HE (Usher & Medow 2010) for different professional fields of study and for a low level of father’s education or a high level of father’s education. We used data from students’ survey only for Bulgaria and selected five fields: (1) pedagogy; (2) economics; (3) management and administration; (4) general engineering, and (5) medicine, dentistry, and pharmacology. As for the qualitative data we applied thematic analysis.

The results show that countries differ in terms of the inclusiveness and fairness of HE for students of different social backgrounds and that the most inclusive countries are not always the fairest, and vice versa. Regarding access in relation to what, preliminary findings show that the group of people with a father with an HE degree was overrepresented in all fields studied. Nevertheless, we observe considerable differences across fields. Pedagogy could be considered as the fairest field in terms of

representation of students from both low and high educational backgrounds, whereas medicine, dentistry, and pharmacology could be considered as least fair by the same criteria. We then expand our research insight into the meaning of these findings for individual student participation in HE by analysing qualitative data from student interviews, thus allowing us to overcome some of the 'blindness' of quantitative data and make student voices heard.

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Panel 9 - Mixed method vignette studies

Teacher expectations and student participation: using qualitative inquiry to design case vignettes in a quantitative experimental factorial survey

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In recent years, experimental methods in survey research have been receiving increased attention, and researchers are starting to see the huge potential of case vignettes to measure important impact factors and model the complexity of professional judgments (Wallander & Laanemets, 2017). Several recent studies have applied case vignettes as part of a factorial survey design to answer research questions in social science, educational and social psychological research (Hanimann, 2023; Heyder & Kessels, 2015; Wallander & Blomqvist, 2019; Walther et al., 2022). In the field of teacher expectancies research, several studies have used case vignettes to measure the impact of student characteristics on teacher expectations of students (Geven et al., 2021; Heyder & Kessels, 2015). When designing case vignettes, an important concern is their ecological validity, which is their potential to generalize to natural (everyday life) settings. Several recent studies using case vignettes suggest that they need to be carefully designed for the target population and the educational context to provide ecologically valid results (Geven et al., 2021; Hainmueller et al., 2015; Krolak-Schwerdt et al., 2018).

I discuss the integration of qualitative findings in a quantitative design, based on my PhD project. My project can be characterised as having a sequential mixed-method approach (Bryman, 2016) and

investigates the formation of teacher expectations about students' academic performance (Wang, 2018). I have conducted a qualitative observational study of student participation in classroom teaching at four different public Danish compulsory schools. The aim of the study was to gather empirical data to inform the design of case vignettes in a quantitative experimental factorial survey study. The factorial survey study will investigate student participation as an impact factor on the formation of teachers' expectations towards academic performance, and the possibility of latent bias in teacher expectations (Aydin & Ok, 2022; Murdock-Perriera & Sedlacek, 2018).

I present qualitative findings that suggest that vignettes, in the context of my study, can advantageously be informed by qualitative inquiry to improve ecological validity. Teachers' interpretations and reactions to student behaviour were observed to change according to highly volatile expectation structures enacted by teachers throughout the course of a lesson. These expectation structures were often unspoken and not always explicit to the outsider. Instructional approach and activity type emerged in the qualitative data as important contextualising elements of student classroom behaviour and engagement during lessons. Also, students participated very differently even if part of the same instructional and socioemotional environment.

Conclusively, I argue that participation is a very complex phenomenon and consider the implications of my qualitative findings on my design of case vignettes in my experimental factorial survey. My analyses suggest it is meaningful to define different modes of participation as factor levels and crucial to properly contextualise participation by also experimentally varying instructional approach and the activity type as factor levels when conducting a experimental factorial survey.

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Are mathematics pre-service teachers' error diagnostic competencies dependent on their beliefs? A mixed-methods study on the relationship between affect and situation-specific skills

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Recent models of teacher competence and its relevance for classroom practice in mathematics educational research assume a continuous concept of competence that encompasses both cognitive and affective dispositions of teachers, such as their knowledge and beliefs, and the performance of teachers, i.e. their observable actions in the classroom. In between, it is assumed, mediate so-called situation-specific skills that encompass aspects of classroom perception, interpretation, and decision-making and that teachers can situationally draw upon in specific varying demanding situations of teaching (Blömeke et al., 2015).

Previous analytical approaches to teacher competence research attempted to measure different dispositional constructs of teacher competence, such as knowledge or beliefs, each analytically separate from the other, and to contextualize different constructs in order to reach conclusions about the structures of professional teacher competencies. With new, situationally oriented survey methods (e.g. by video-vignettes), however, it is now possible to examine teacher competencies in a way that is more closely aligned with professional practice, although structural relationships between dispositional and situational aspects of competence have not yet been clearly clarified, since dispositional and situational aspects of teacher competence may be of different natures.

Therefore, the study presented here integratively investigates possible relationships between mathematics pre-service teachers' (cross-situational) dispositional beliefs and their situationally measured error diagnostic competence, which as a situation-specific skill includes aspects of error perception as well as interpretation and decision making.

The integrative research question of the study is therefore as follows: How are pre-service teachers' cross-situational beliefs about mathematics and the teaching and learning of mathematics related to their situational diagnostic error competence? The hypotheses guiding the

analyses relate to the fact that, according to the assumptions of the competence models, dispositional beliefs should guide situation-specific skills and also lead to the suggestion of actions congruent with them, i.e., that situational action is to some extent dependent on cross-situational beliefs.

The empirical contribution is based on a parallel mixed-methods study in which 179 mathematics pre-service teachers (PSTs) analyzed video vignettes of students' activities on mathematics outdoor activities (Buchholtz, 2021a) in an online survey. PSTs had to check the mathematizations made by the students in interaction with the real objects for mathematical correctness. Student errors first had to be perceived and interpreted regarding possible causes, and options for action had to be generated by evaluating a teacher's intervention shown in the video and describing alternative actions in written responses. The evaluation of the data is methodically oriented towards qualitative content analysis. In addition, the online survey included a quantitative Likert scale-based standardized questionnaire on (cross-situational) beliefs about mathematics and the teaching and learning of mathematics. The methodological approach to analyzing the quantitative data was via factor analyses.

First qualitative results showed different patterns of situational error-diagnostic competence across the whole sample, which can be seen for example in pre-service teachers' varying orientation in perceptions and interpretations of different kind of errors (e.g. a stronger orientation towards measurement errors, erroneous conceptions or errors in mathematical formulas) but also in different ways of dealing with errors situationally (e.g. explaining errors to students in the situation or giving impulses for self-recognition of the error). In terms of cross-situational beliefs, in the quantitative results the overall sample showed a strong preference among pre-service teachers of constructivist and dynamic-oriented beliefs.

The approach to method integration and identification of meta-inferences is now not to evaluate the different aspects of teacher competence separately for the total sample, but to select PSTs with specific dispositional belief profiles (static-dynamic; constructivist-transmission-oriented) and to examine their situationally elicited responses to error-diagnostic competence in more detail. The integration is guided by the assumption that dispositional cross-situational beliefs are manifested in PSTs' practically-oriented situation-specific skills, i.e., that students' beliefs influence their specific perception, interpretation, and decision-making in classroom situations. The specific added value of methods integration is the complementarity of approaches (Buchholtz, 2020). Overall, the mixed methods research design can contribute to clarifying the complex relationships between dispositional and situational aspects of teacher competence.

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Panel 10 - Getting ready for higher studies

Through the vocational pathway to higher education?

A mixed methods study investigating vocational schools' support of their heterogeneous learners

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Vocational school types with acquisition of higher education entrance certificates (HEEC) have been institutionalized in a wider scope during the educational expansion processes in the 1960s/70s and exist with little consideration alongside the traditional routes to higher education (HE). They serve as gathering places, especially for non-privileged students who could not follow the linear path to HEEC. The contribution focuses on the question of how those schools bring non-privileged students to HE.

While there is initial evidence that vocational school types show different potentials to reduce social inequality at transition to HE (Schindler, 2014), a systematic analysis of the different school type effects and the schools' institutional and organizational support structures and practices is missing. Existing quantitative data sources lack an appropriate number of students or analyse a limited number of school types in specific federal states. Qualitative studies miss finding general patterns. To explore the research topic in more width and depth, the project uses a mixed-methods approach.

My dissertation project joins a broad amount of research investigating socially unequal transitions to HE, with a specific interest in institutional and organizational contexts. In these contexts, vocational schools are understood as institutions of permeability. Hence, the concept of institutional permeability of Bernhard (2017) is used as the conceptual framework of my qualitative data analysis. It argues that granting formal access to HE is not sufficient for socially equal transitions to HE, but a supportive context at school and a difference-sensibility towards the heterogeneous needs of learners.

I will present the mixed-methods design of the research project and extend it by focusing on a result-based integration of the quantitative and qualitative findings. The project followed an explanatory sequential design: We used the results of our quantitative data analyses as the basis for selecting cases for our qualitative data collection. First, we performed multinomial logistic regressions with data of the DZHW panel of school leavers with a HEEC and found general patterns of study intentions among students of different vocational school types. Second, we selected three school types (*Berufliches Gymnasium/BG*, *Fachoberschule/FOS*, *Berufsoberschule/BOS*) in Lower Saxony and conducted over 60 interviews at nine schools with the schools' personnel about the structures and pedagogical practices used to support the transition to HE. The interviews were analysed using qualitative content analysis following Gläser and Laudel (2010).

The results showed that FOS students are internally heterogeneous in terms of their previous vocational experience. While the quantitative results showed a rather high intention to study, but also for VET, the qualitative analyses explained the finding insofar as these groups of students are treated very differently internally. Teachers often prefer that students begin vocational training after graduation, which is also considered as good preparation for HE. Thus, an important finding is that vocational qualification should be controlled for in analyses of FOS students. We found fewer differential findings for the BG and BOS. Overall, the mixed-methods analyses turn out to be enriching for the research field, but can only partially address the problems of quantitative research.

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(In)equality and (in)visibility at the gateway to higher education: refugees in the world of study preparation programs for international students in Germany

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In order to enroll in a degree program in Germany, international students are generally required to demonstrate German language proficiency at level C1 of the Common European Framework of Reference for Languages (CEFR) and the equivalence of their higher education entrance qualification to the German Abitur. These achievements can be acquired after entering Germany through long-established institutional educational pathways including preparatory courses at so-called ‘Studienkollegs’ and language centers of the higher education institutions (HEI). Refugees intending to take up university degree programs in Germany must generally prove that they meet the same formal requirements as other international applicants with non-EU passports. Therefore, in the years after 2015, the federal and state governments have massively funded the expansion of course places for refugees in study preparation programs (DAAD, 2020), with the federal government's ‘Integra’ program alone receiving well over 100 million euros to date. The BMBF-funded research project ‘Pathways of Refugees to German Universities’ (WeGe) investigated the conditions for successful study preparation and university access for refugees in Germany using a mixed methods approach

(Grüttner et al., 2020; 2021). We conducted expert interviews with teaching and management staff at HEIs. Episodic interviews and quantitative surveys among participants of study preparation courses captured their respective perspectives. In addition, the survey questionnaire included an open-ended question to allow for feedback or to add individual perspectives and pressing issues. Our paper examines how refugee stigma renders invisible the structural barriers faced by refugee students, thus reinforcing inequalities in the chances of success in study preparation. We draw on the sociology of conventions (Boltanski & Thévenot, 2007) and relate it to the concept of stigma (Goffman, 1963) to theorize the connection between (in)visibility and (in)equality of refugee students at HEIs. Therefore, we incorporate a notion of moral positionings (Langenhove & Harré, 1999) and symmetric and asymmetric visibility (Krüger & Hesselmann, 2020). We reconstruct intersecting convention-based moral contexts, the world of study preparation and the world of asylum. A plurality of conventions is governing what is communicable and by whom in each world, and (a)symmetric visibility constellations tend to make refugee students' needs invisible. Qualitative content analysis of open-ended statements and the quantitative data produce divergent results and reveal how stigma undermines the addressability of refugee students' experiences by the HEIs as well as the capability of refugee students to raise their voices. We discuss implications for pedagogical categorization practices (Horvath, 2019) and for organizational responsiveness in the implementation of study preparation programs for refugee students at HEIs in Germany.

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Poster Presentations

Mixed Methods AI Skills Gap Analysis for Vocational Education and Training (VET)

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Artificial intelligence (AI) is one of the most dominant topics in education and workplace training. Specifically, the skills required for the 21st century workforce to leverage the opportunities AI presents are constantly being defined, refined and changing in this rapidly evolving space. The AI4VET4AI project is an EU funded Center of Vocational Excellence (CoVE) which aims to establish a transnational European platform for vocational education and training (VET) excellence. This platform aims to contribute to the digital transformation of the EU labor market by introducing innovative teaching content and methods into vocational education and training (VET) curricula across 11 European countries. The primary goal is to support and foster the growth of a skilled workforce in the field of artificial intelligence (AI).

As part of the AI4VET4AI project, a skills gap analysis is required to identify what sets of AI related skills the VET system needs to be training the future workforce in. This led to the development of seven research questions:

RQ1: What are the current skill gaps at the intersection of AI related skills and VET?

RQ2: What AI skills are in increasing demand from 2020 onwards, for VET students or graduates in the labor marketplace?

RQ3: Which occupations are going to need an AI skilled, VET qualified workforce, the most in the next 10 years?

RQ4: What skills belong to the AI literacy skill set?

RQ5: Are there any country or regional differences in the AI skills gap by occupation?

RQ6: What methods can be implemented to provide ongoing and adaptive recommendations for the development of state of the art AI skills curricula?

RQ7: What are the most effective methods for disseminating AI teaching materials?

To address the research questions, three independent research methods are used to establish converging evidence on what AI related skills are required to meet future labor market demand. The first method is a systematic literature review, which is augmented to include a systematic data review (RQ1-5). The second method is a traditional labor market survey on VET related occupations and their training needs (RQ1-7). The survey target groups include both VET trainers/teachers and industry employers (HR or Product line managers). Using the ESCO framework to link occupations to skills,

this quantitative survey is expected to capture the labor market demand for AI related skills across multiple industries and countries. Finally, the Delphi technique will be used to engage experts on where they see the future of AI in the workplace, and help define what AI related skills are going to be most important over the next 10 to 20 years (RQ3-7). It is expected that these three independent methods can then be combined to identify converging evidence as to what skills are most important for VET education in the near future, providing a foundation for curriculum development across the EU.