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RESEARCH ARTICLE OPEN ACCESS

Young People as Actors in Their Occupational Careers: Effective Strategies to Increase the Chances of Entering an Attractive VET Programme After Leaving a General Education School in Germany

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ABSTRACT

This article focuses on the question of what strategies general education graduates can use to improve their chances of entering an attractive vocational education and training (VET) programme in Germany. We look, in particular, at grades in the school-leaving certificate and the additional acquisition of a higher qualification at a vocational school. By using a vignette study, we focus on the selection by companies that offer training. Our results show that excellent grades in the school-leaving certificate of graduates with only an intermediate school-leaving qualification or an entrance qualification for a university of applied sciences improve their chances of entering a VET programme in comparison to more highly qualified competitors with very poor grades. One far more effective way is to upgrade their qualification at a vocational school in combination with professional knowledge relevant to the field of the desired VET programme. In particular, this protects graduates with an intermediate school-leaving qualification from a devaluation of their qualification when applying for a VET programme with a high proportion of applicants who have a university entrance qualification. However, there is a negative effect on their chances if they upgrade their qualification in a vocational field that is not relevant to the desired VET programme. This indicates the importance of career counselling at schools.

1 | Introduction

At the beginning of an occupational career, little information about job applicants is available to employers. In countries with stratified school systems, this is, in particular, information that indicates the type of education (Allmendinger 1989; Di Stasio and van de Werfhorst 2016). In this article, we focus on entry into dual vocational education and training (dual VET) programmes, the completion of which is a key prerequisite for entering the labour market in countries, such as Switzerland and Germany. Completing an attractive dual VET programme is of great importance for future income levels and career opportunities and for minimizing unemployment risks (Korber and Oesch 2019; Forster and Bol 2018).

Places on attractive dual VET programmes with good future income opportunities are in demand, and applicants are expected to have favourable educational characteristics, such as a high-level educational qualification. To improve their chances, more and more students are completing their general schooling with the highest school-leaving qualification (Hadjar and Gross 2016), which in many countries is the higher education entrance qualification (HEEQ, corresponding to level 4 in the European Qualifications Framework). As a result of educational expansion, the recruitment requirements for attractive dual VET programmes have risen in terms of the level of school-leaving qualification (Klein 2013). In this article, we ask whether and how applicants who do not leave general schooling with a HEEQ can significantly improve their chances of being

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accepted for an attractive training programme. We, therefore, see young people without a HEEQ not as potential losers in educational expansion but rather as actors in their educational and occupational biographies.

To this end, we analyze characteristics that the applicants themselves can influence. These are the grades in the school-leaving certificate of general education, the subsequent attainment of a higher qualification at a VET school and the additional acquisition of vocational skills. In many countries—including Germany—graduates of general schooling can attend a VET school, where they can upgrade their qualifications and, at the same time, acquire vocational skills. In this article, we are interested in whether an applicant with a certain qualification from general schooling can improve his or her chances of being invited for an interview for an attractive dual VET programme by (a) achieving good grades in their general schooling, (b) upgrading their qualification at a VET school and (c) acquiring (as a further qualification) vocational knowledge at a VET school that is relevant to the subsequent VET programme. In this way, we attempt to provide insights into how applicants can improve their chances of gaining access to an attractive dual VET programme and derive implications for career guidance at schools. We use data from Germany, which is a country with an early stratification at the lower secondary level in the general school system, a strong opening via VET schools at the upper secondary level and a strong dual VET system (Cedefop and Federal Institute for Vocational Education and Training [BIBB] 2022).

Our study expands the state of existing research. In countries with a stratified school system, the school-leaving qualification obtained at the end of general schooling is very strongly linked to the choice of track after primary school. So far, there has been little systematic research on how applicants can improve the outcome of their first school-leaving qualification from general education (Protsch and Solga 2015; Nennstiel 2021; Fossati, Wilson, and Bonoli 2020; Schuchart and Schimke 2024). We ask not only what strategies represent an improvement compared with equally qualified applicants from general schooling but also what strategies reduce the gap between them and more highly qualified applicants. Although it has often been established that better grades and higher qualifications also lead to better chances of entering VET programmes, there is a lack of comparative analyses on the significance of educational characteristics. By using a vignette study, we are able to focus on selection by companies that offer training and systematically examine the effect of various education-related characteristics. There are only a few studies that examine the significance of school-leaving qualifications for entry into a VET programme and differentiate between self-selection by applicants and selection by companies (Schuchart and Schimke 2024; Fossati, Wilson, and Bonoli 2020; Protsch and Solga 2015). However, Protsch and Solga (2015) only refer to a single school type, and Fossati, Wilson, and Bonoli (2020) do not systematically investigate which educational strategies applicants can use to improve their chances of successfully entering a VET programme.

However, we analyze not only the effectiveness of individual strategies but also the conditions under which they are particularly effective. Supply-side characteristics have an influence on

how educational qualifications are interpreted by employers. In this article, we focus on the proportion of trainees with a HEEQ who are in a VET programme. The expansion in education has led to the displacement of less highly qualified applicants into less attractive VET programmes and occupations due to the increasing proportion of applicants with a HEEQ (Klein 2013). The higher the proportion of trainees in a VET programme with a university entrance qualification, the more difficult it should be for less highly qualified applicants to be admitted to this programme. As yet, there have been no studies that systematically investigate how applicants without a HEEQ from their general schooling can increase their chances of gaining a place on a highly attractive VET programme.

For this article, we use data from a vignette study of human resources (HRs) professionals in companies that offer VET programmes for occupations with a very good salary and career prospects. We focus on vignettes with profiles of applicants who have an intermediate school-leaving qualification (= “mittlerer Schulabschluss”) and a HEEQ (both “Fachhochschulreife” and “Abitur”) from their general schooling and applicants with a HEEQ gained later at a vocational school.

2 | Theoretical and Empirical Background

2.1 | Pathways to School Qualifications and Dual VET Programmes in Germany

Generally speaking, Germany has a two-tier general education school system. Depending on their performance at primary school, students usually move on to a school track that leads either to a HEEQ (e.g., at a “Gymnasium”, lasting 8 years) or to a type of school that leads to a qualification below HEEQ (e.g., at a “Sekundarschule”, lasting 5–6 years, see Figure 1). In the 2021 school year, 35% of students in Germany graduated from general schooling with a HEEQ and 42% with an intermediate qualification (German Federal Statistical Office 2022a, 2022b). This means that Germany is one of the countries with a rather low proportion of students who acquire a HEEQ at the end of compulsory schooling. For this reason, alternative pathways to HEEQ via vocationally oriented schools are of great importance.

After completing general schooling, students have the opportunity to upgrade their school qualification and acquire a HEEQ at a VET school (e.g., a “berufliches Gymnasium” or a “Fachoberschule”). In the programmes that lead to HEEQ, in addition to general school subjects, VET schools also teach vocational knowledge and provide practice in a vocational field, for example, “wood technology and construction” or “health and social services”. On entering a VET school to obtain a HEEQ, students choose a specific vocational field. Note that in these programmes, a full VET qualification (“Ausbildungsabschluss”) cannot be obtained. In the 2020 school year, 35% of all HEEQs were obtained at VET schools (German Federal Statistical Office 2022a, 2022b). VET schools, therefore, play a major role in upgrading intermediate school-leaving qualifications.

A distinction is made between two types of HEEQ, namely, a HEEQ that leads to a general university entrance qualification (= “Abitur”, HEEQ_{general}), which entitles a student to study at a

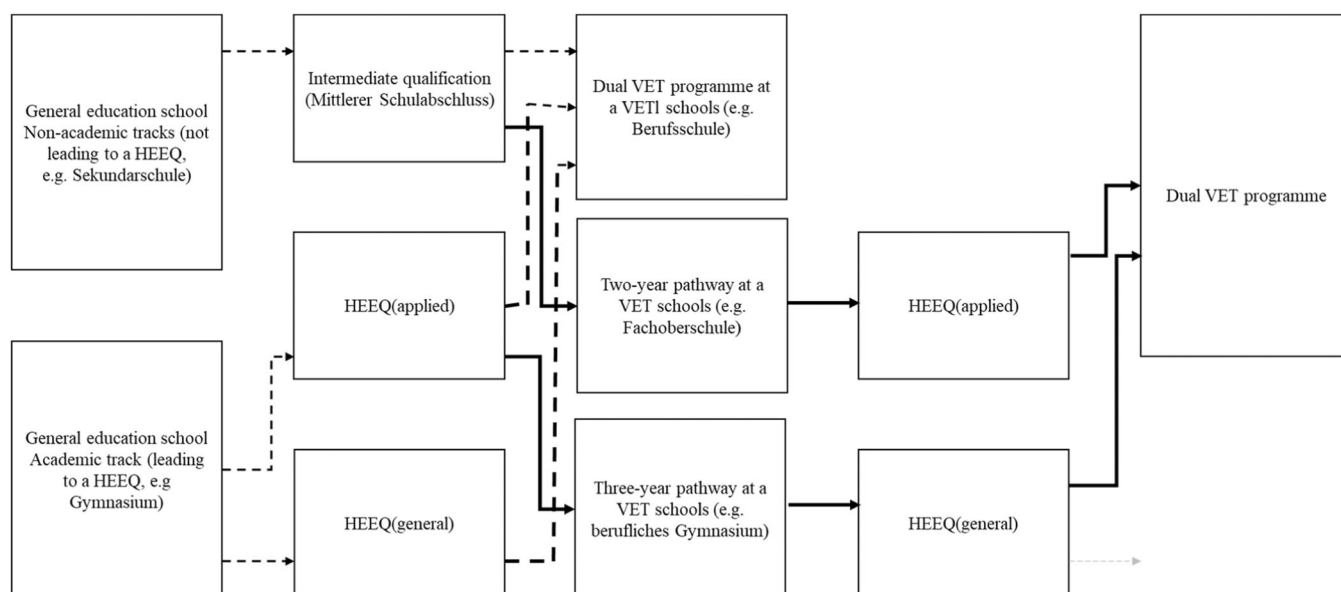


FIGURE 1 | Selected educational pathways to dual VET programmes in Germany. *Note:* This is a simplified representation. The names of the school types may differ in individual federal states. Only pathways relevant to the analyses in this article are shown here. Direct pathways from a general education school to a VET programme are shown by dotted lines. Pathways via a VET school that include upgrading to a higher school qualification are shown in solid lines. HEEQ_{applied}, higher education entrance qualification for a university of applied sciences; HEEQ_{general}, higher education entrance qualification for a university; HEEQ, higher education entrance qualification; VET, vocational education and training.

university, and a HEEQ that leads to a university of applied sciences (= “Fachhochschulreife”, HEEQ_{applied}). The HEEQ_{general} can be acquired in an academic track in general schooling, such as the Gymnasium and a 3-year programme at a VET school (e.g., a “berufliches Gymnasium”). The number of hours in general school subjects corresponds to the number of hours in these subjects at general education schools (Schuchart 2013). The HEEQ_{applied} can be obtained at VET schools in 2-year programmes. These programmes generally consist of a school-based part, which is only fully recognized after a vocational internship lasting 1 year (Kultusministerkonferenz 2001). At VET schools, the internship is part of the educational programme. In most German federal states, students can graduate with the school-based part of the HEEQ_{applied} after 1 or 2 years of senior classes in an academic track in general education (they leave school 1 or 2 years earlier than those who obtain a HEEQ_{general}). In this case, the internship must subsequently be completed to obtain a full HEEQ_{applied}. Compared with a HEEQ_{general} from general schooling, obtaining a full HEEQ_{applied}, therefore, means less general education but significantly more practical knowledge due to the internship.

After completing general schooling or VET schooling, graduates can apply for a dual VET programme regardless of the level of their school-leaving qualification. This usually lasts 3.5 years (shortening is possible under certain circumstances). A dual VET is characterized by the fact that learning and instruction at a vocational school (“Berufsschule”) take place parallel to practical training in a dual VET company. Prospective applicants must first apply to and be accepted by a company that offers training. The dual VET qualifications are recognized nationwide. Companies very often hire their own trainees after completion of the VET programme, and the unemployment rate among dual VET graduates is low (Protsch and Solga 2019;

Autor:innengruppe Bildungsberichterstattung 2022). Dual VET programmes also differ in terms of their subsequent salary and promotion opportunities. Although there are no formal selection criteria related to school qualifications, the proportion of trainees with a HEEQ is higher in attractive VET programmes than in less attractive VET programmes (e.g., the average entry salary of a bank clerk [70% of trainees with a HEEQ] is 2736 euros, but that of a salesperson [20% of trainees with a HEEQ] is 1938 euros).

2.2 | School-Leaving Certificates, Grades, Vocational Knowledge and Skills as Signals

In research on the selection decisions of companies, it has become widely accepted to see the information available in applications at the beginning of the selection process as “signals” (Fossati, Wilson, and Bonoli 2020; Protsch and Solga 2015; Van Belle et al. 2020). This is based on signalling theory (Spence 1974), which assumes that employers cannot know how productive applicants will really be. They, therefore, rely on information that signals their productivity—such as school-leaving certificates. Within the framework of labour queue theory, Thurow (1975) assumes that applicants do not yet have the necessary skills to perform a specific job and, therefore, first need to be trained. School-leaving qualifications are, therefore, signals of the “trainability” of applicants, that is, how quickly and how well they can cope with new challenges. Other authors assume that in addition to productivity and trainability, the educational information in applications signals noncognitive skills, such as performance-related attitudes and motivation (Van Belle et al. 2020).

In the following, we discuss school-leaving certificates, grades, vocational knowledge and skills as signals that are interpreted

by employers as indications of productivity, trainability and motivation. We then formulate hypotheses on how students with an intermediate school-leaving qualification or a HEEQ_{applied} from their general schooling can improve the signalling value of their application.

2.2.1 | School Certificate

School-leaving certificates serve (together with grades) as signals of productivity, trainability and noncognitive skills. Accordingly, school-leaving qualifications are associated with a successful entry into training programmes (Beicht and Walden 2014; Nennstiel 2021). Against this background, we formulate Hypothesis 1 as a starting point:

H1. *Applicants with a higher general schooling qualification are more likely to be invited for an interview than applicants with a lower general schooling qualification. Specifically, we assume that applicants with a HEEQ_{general} have better chances than applicants with a HEEQ_{applied} (only the school-based part of this qualification), while the latter have better chances than applicants with an intermediate qualification.*

2.2.2 | Vocational Knowledge and Skills

Students who leave general education with an intermediate qualification or a HEEQ_{applied} can upgrade their qualification by attending a VET school to earn a higher qualification. Compared with students who do not obtain this higher qualification, they thereby acquire additional general and vocational knowledge, which in turn should signal higher productivity and faster adaptation to practical requirements. This results in Hypothesis 2:

H2. *Compared with less highly qualified applicants from general schooling, those who have earned a higher school-leaving qualification at a VET school improve their chances of being invited for an interview. Specifically, we expect that applicants with a HEEQ_{applied} from a VET school will have better chances of being invited for an interview than applicants with an intermediate qualification from general schooling, and applicants with a HEEQ_{general} from a VET school will have better chances of being invited for an interview than applicants with a HEEQ_{applied} (school-based part of this qualification) from a general education school.*

Vocational knowledge and skills acquired at VET schools should be an advantage for dual VET applicants. However, this should specifically be the case if the qualification is acquired in the vocational field of the prospective dual VET programme. This assumption is supported by studies showing that the chances of entering a dual VET programme are higher if the vocational knowledge corresponds to the field of training (Rahn and Fuhrmann 2023). Studies on entering the labour market also show that relevant practical experience leads to a greater likelihood of being invited for an interview and being hired (Van Belle et al. 2020; Weiss, Klein, and Grauenhorst 2014; however, it must be mentioned that these studies do not focus

on school leavers). Against this background, we formulate the following hypothesis:

H3a. *Compared with equally qualified applicants from general education schools, applicants with qualifications from a VET school and vocational knowledge in the field of the VET programme they apply for have better chances of being invited for an interview.*

H3b. *Compared with equally qualified applicants from general education schools, applicants from VET schools who have not obtained their qualification in the field of the VET programme have only similar chances of being invited for interview.*

2.2.3 | Grades

Grades are a good signal for productivity (Nennstiel 2021), and better grades increase the probability of being invited to a job interview (Protsch and Solga 2015) and being admitted to a VET programme (Fossati, Wilson, and Bonoli 2020). When grades are controlled for, a higher school-leaving qualification continues to have a favourable effect (Fossati, Wilson, and Bonoli 2020; Nennstiel 2021; Protsch and Dieckhoff 2011). Good grades cannot compensate for the advantage of a higher school qualification but may reduce this advantage. This leads to Hypothesis 4:

H4. *Differences in the probability of being invited for an interview between lower-qualified applicants from a general education school and more highly qualified applicants from (a) a general education school, (b) a VET school together with vocational knowledge relevant to the field of the VET programme and (c) a VET school together with vocational knowledge not relevant to the field of the VET programme (as expected in Hypotheses 1 and 2) decrease with better grades in the school-leaving certificate of less well-qualified applicants.*

2.3 | Attractivity of the VET Programme and Its Significance for the Signalling Value of School Qualifications

The expansion of pathways to a HEEQ via VET schools has contributed over time to a significant increase in the proportion of school graduates with a HEEQ (Schuchart and Schimke 2019). A significant proportion of these graduates, particularly those from VET schools, enter dual VET programmes (Müller 2001). From the perspective of signalling theory, it is assumed that with increasing proportions of more highly qualified applicants, a higher school-leaving qualification no longer indicates that applicants have the same skills as before (Hämäläinen and Uusitalo 2008). This assumption has rarely been tested for school leavers with the aim of entering a VET programme (Schuchart and Schimke 2019). According to Thurow (1975), an oversupply of more highly qualified applicants leads to a displacement of poorly qualified applicants. Against this background, we expect:

H5. *Differences in the probability of being invited for interview between less well-qualified applicants from a general education school and more highly qualified applicants from (a) a general education school and (b) a VET school (as expected in Hypotheses 1 and 2) increase as the proportion of applicants with a HEEQ in a vocational programme increases.*

This hypothesis means that graduates of a general education school need a higher school-leaving qualification from a VET school to improve their chances of entering a highly attractive VET programme. But what are the chances for applicants with a qualification obtained at a VET school compared with equally qualified applicants who obtained this qualification at a general education school? The latter have shown that their cognitive skills were sufficient to obtain earlier in their school career a qualification, which the former obtained later in their school career at a VET school. In H3a, we expect—compared with equally qualified applicants from general schools—an advantage for applicants from vocational schools with vocational knowledge relevant to the VET programme they apply for, and with H3b, comparable chances for applicants from vocational schools with vocational knowledge not relevant to the VET programme they apply for. Against this background and considering the proportion of trainees with a HEEQ in a VET programme, we expect:

H6a. *Differences in the probability of being invited for an interview for a VET programme between equally qualified applicants from a general education school and from a VET school with relevant vocational knowledge and skills (as expected in Hypothesis 3a) decrease as the proportion of applicants with a HEEQ in the VET programme increases.*

H6b. *Differences in the probability of being invited for an interview for a VET programme between equally qualified applicants from a general education school and from a VET school but without relevant vocational knowledge and skills (as expected in Hypothesis 3b) increase as the proportion of applicants with a HEEQ in the VET programme increases.*

3 | Methodology

The hypotheses guiding the research are tested using a discrete choice experiment (DCE, Street and Burgess 2007). In a DCE, different vignettes (in our case of applicant profiles) are presented simultaneously, and the respondents have to select their preferred one. By experimentally varying the components of these alternatives, the weighting of the various characteristics in the decision process can be determined. In contrast to survey or observational data, this makes it possible to test causal relationships (Auspurg and Liebe 2011). The core of our DCE is selection based on short application profiles (= vignettes) for a fictitious place on a VET programme by recruiters.

3.1 | Sample Selection

The target population of the survey is HRs professionals whose tasks include the selection of trainees for at least one of the 10 VET occupations (see Table 1). Their contact information was

TABLE 1 | Characteristics of dual VET programmes.

Classification of occupations (KldB) 2010 (five-digit)	New trainees in 2021	Percentage of these with intermediate qualification	Percentage of these with HEEQ	Percentage of these with HEEQ (%)
22342	Carpenter ("Tischler/in")	8142	42	36
43102	IT specialist ("Fachinformatiker/in")	15,525	33	59
61212	Businessman/woman for wholesale and foreign trade management ("Kaufmann/Kauffrau für Groß- und Außenhandelsmanagement")	10,716	42	52
63222	Hotel specialist ("Hotelfachangestellte/r")	5610	38	30
71302	Industrial clerk ("Industriekaufmann/-kauffrau")	14,265	28	69
71402	Office management assistant ("Kaufmann/Kauffrau für Büromanagement")	22,845	48	39
72112	Bank clerk ("Bankkaufmann/-kauffrau")	7602	29	70
73112	Legal assistant ("Rechtsanwaltsfachangestellte/r")	3222	50	44
73212	Social security clerk ("Sozialversicherungsfachangestellte/r")	2388	31	69
81102	Medical assistant ("Medizinische/r Fachangestellte/r")	17,439	53	20

Abbreviations: HEEQ, higher education entrance qualification; IT, technology specialist; VET, vocational education and training.

obtained via their own job advertisements in the Federal Employment Agency's job search. The contact details were randomly collected from advertisements covering the 10 occupations in the period between June and December 2022. In Germany, more than 70% of companies use the (local) Federal Employment Agency for recruiting trainees, so the sampling procedure appears to reach a representative target group (Bundesinstitut für Berufsbildung 2015). In total, the targeted sample included 5590 contacts after adjustment for multiple entries. In mid-January 2023, the randomly selected HR professionals were invited by email to participate in the online survey, and after a 16-day field period, a total of 1308 participated (response rate, 23.4%). Respondents were informed that they could expect three decision scenarios, each with three short application profiles, as part of a survey, taking up approximately 5 min of their time. Following this experimental module, the respondents were asked to answer a few questions about themselves and their work context.

The selection of dual VET programmes was based on two criteria with the aim of mapping the labour-demand side of the German VET market for attractive VET programmes. Firstly, occupations were selected that are of quantitative significance for the German VET market. In total, the 10 selected occupations represent more than 27% of all new training contracts in 2021 (German Federal Statistical Office 2022a, 2022b). The second selection criterion was the composition of trainees based on their school-leaving qualifications. In the VET programmes, in the sample used for the analyses, most of the trainees have an intermediate school-leaving qualification or a HEEQ (= attractive VET programmes, see Table 1).

For our study, it is also important whether or not the school-leaving qualification acquired at a VET school included vocational knowledge relevant for the chosen VET programme. This classification was carried out a priori based on the federal state-specific training programmes and the professional focus of the occupation. This classification was evaluated by the respondents in the survey module. Each respondent who had seen at least one short profile with applicants from a VET school in the experimental module was asked to assess the relevance of the vocational knowledge in terms of the transferability of the acquired knowledge to the VET programme. If a respondent had seen more than one vignette with applications from a VET school, a simple random selection was made so that each respondent provided a maximum of one assessment. The evaluation of the classification shows results according to our expectations for each of the 10 training occupations and for each of the up to three types of VET school so that the prerequisites for the distinction between relevant and nonrelevant prior vocational knowledge and skills are met (see Table A1 in the appendix).

3.2 | Vignette Design

The profiles were based on written CVs—with a total of five characteristics (= factors) and varying characteristics (= levels)—and presented to the test subjects simultaneously in a choice set with three applicant profiles. The task was to select the most promising application.

The most important factor for this study is the school-leaving qualification in combination with the school type (general education school, VET school). Vocational knowledge and skills can only be acquired at a VET school. HR professionals saw the profiles of applicants with an intermediate-level qualification, a HEEQ_{applied} and a HEEQ_{general} who had acquired their qualifications at different general education school types and selected VET schools (see Table 2). To reduce the complexity of an international readership, we decided to combine the levels for the general education school types.¹ In the following, we refer to these applicant profiles: intermediate school qualification from a general education school (Realschule or Schule mit zwei Bildungsgängen or comprehensive school or Gymnasium), HEEQ_{applied} and HEEQ_{general} from a general education school (comprehensive school or Gymnasium), HEEQ_{applied} and HEEQ_{general} obtained at a VET school with vocational knowledge and skills acquired in a field (a) relevant or (b) not relevant to the desired VET programme.

The other two variables central to the analyses are the experimental factor grades and the proportion of trainees with a HEEQ in the VET programmes of the sample. In the vignette, HR professionals were informed whether the applicants had a grade point average of 1.3, 2.3 or 3.3. The proportion of trainees with a HEEQ was derived from data from the BIBB service DAZUBI.

Other characteristics relevant to selection decisions such as gender, age and immigration background were in addition varied experimentally in the short profiles (see Table 2). In the analyses, these experimental factors are treated as covariates and they are not dealt with separately in the presentation of results. An overview of the distribution in the sample can be found in Table 3.

The size of the vignette universes for creating the short profiles results from the Cartesian product of the factors and their characteristics. If all factor levels are combined with each other, the experimental part, therefore, consists of a total of 1092 profiles ($2 \times 2 \times 3 \times 7 \times 13$ levels) (see also Table 3). These vignettes were grouped into choice sets of three for the experiment. The choice-set universe results from the size of the vignette universe and the number of simultaneously presented alternative courses of action and can be calculated using the binomial coefficient (n over k). In the present experimental design, 216,432,580 different choice sets are conceivable if all possible vignette combinations are allowed in a choice set.² An experimental selection of the choice sets was, therefore, necessary before field use. For the fractionalization of the complete designs, 90 choice sets were selected in such a way that at the same time, all the central requirements for DCE designs were ensured as far as possible: (1) orthogonality, (2) balance of the factor levels and (3) minimal overlap of the factor levels within a set (Huber and Zwerina 1996; Auspurg and Liebe 2011). Design formation was carried out using the R package *idefix* (Traets, Sanchez, and Vandebroek 2020). A D-Bayesian error of 0.219 is reported for the final design.

Following the experimental selection of the choice sets, they were combined into 30 blocks of three. Each participant was randomly assigned to a block for the experimental part of the survey and, therefore, rated 3 choice sets with 9 vignettes in total. The order of the choice sets and the vignettes within the

TABLE 2 | Experimental factors.

Experimental factors	Factor levels
Gender	Female Male
Immigrant background	German first and last name German first name and Turkish last name German first name and Polish last name Turkish first and last name Polish first and last name Turkish first name and German last name Polish first name and German last name
School-leaving qualification and school type	Intermediate qualification/Gymnasium HEEQ_{applied}/Gymnasium HEEQ_{general}/Gymnasium Intermediate qualification/comprehensive school HEEQ_{applied}/comprehensive school HEEQ_{general}/comprehensive school Intermediate qualification/secondary school Intermediate qualification/vocationally oriented school ^a (not relevant) Intermediate qualification/vocationally oriented school ^a (relevant) HEEQ_{applied}/vocationally oriented school^b (not relevant) HEEQ_{applied}/vocationally oriented school^b (relevant) HEEQ_{general}/vocationally oriented school^c (not relevant) HEEQ_{general}/vocationally oriented school^c (relevant)
Grade point average	1.3 2.3 3.3
Age	Normal (16 years if qualification = intermediate qualification; 18 years if qualification = HEEQ _{applied} ; 19 years if qualification = HEEQ _{general}) Older (18 years if qualification = intermediate qualification; 20 years if qualification = HEEQ _{applied} ; 21 years if qualification = HEEQ _{general})

Note: Intermediate qualification (IQ), “Realschulabschluss”; HEEQ_{applied}, higher education entrance qualification for a university of applied sciences (“Fachhochschulreife”); HEEQ_{general}, general higher education entrance qualification (“Abitur”). Identical qualifications from general schools were aggregated to one category for all the following analyses, resulting in IQ/general school, HEEQ_{applied}/general school and HEEQ_{general}/general school.

General school, general education schools; VET school (relevant), VET schools that teach vocational knowledge and skills relevant to the field of the dual VET programme selected; VET school (not relevant), VET schools that teach vocational knowledge and skills not relevant to the field of the dual VET programme selected.

Results for variables reported in this article are highlighted in bold. The results for the other variables are not reported but are integrated into all the statistical models. There is, therefore, no effect on the quality of the experimental design.

Abbreviation: HEEQ, higher education entrance qualification.

^a“Berufsfachschule”.

^b“Fachoberschule”.

^c“Berufliches Gymnasium”.

sets were then randomized, and the respondents were asked to judge the second and third decision scenarios independently of the vignettes of the previous scenarios. Using this block structure, we can ensure that each choice set is assessed by different respondents a sufficient number of times and that no respondent characteristics are unintentionally confounded with vignette characteristics.

3.3 | Strategy of the Analyses

On the one hand, the experimental data has a multilevel structure, as respondents completed a total of three choice sets. On the other hand, the profiles are grouped within the choice sets, so the conditional group structure must be taken into account for the selection probability of individual profiles. To test the research

TABLE 3 | Sample descriptions.

Variables	Mean
<i>Information on the vignettes</i>	
School-leaving qualification and type of school	
Intermediate qualification/general school	0.228
HEEQ_{applied}/general school	0.159
HEEQ_{general}/general school	0.160
Intermediate qualification/vocationally oriented school ^a (not relevant)	0.078
Intermediate qualification/vocationally oriented school ^a (relevant)	0.059
HEEQ_{applied}/vocationally oriented school^b (not relevant)	0.080
HEEQ_{applied}/vocationally oriented school^b (relevant)	0.078
HEEQ_{general}/vocationally oriented school^c (not relevant)	0.076
HEEQ_{general}/vocationally oriented school^c (relevant)	0.081
Grade point average	
1.3	0.319
2.3	0.372
3.3	0.309
<i>Information on human resource professionals</i>	
Gender (1 = Female)	0.641
Age	
Under 30 years old	0.161
30 to under 40 years old	0.247
40 to under 50 years old	0.263
50 years and older	0.329
Recruitment experience (1 = Yes)	0.985
Company size	
Under 6 employees	0.063
6–50 employees	0.351
51–500 employees	0.413
501 and more employees	0.173
<i>N</i> _{vignettes}	11,469
<i>N</i> _{Human resource professionals}	1308

Note: Intermediate qualification (IQ, “Realschulabschluss”; HE EQ_{applied}, higher education entrance qualification for a university of applied sciences (“Fachhochschulreife”); HE EQ_{general}, general higher education entrance qualification (“Abitur”).

Intermediate qualification/general school is the aggregated category for vignettes with this qualification from a Gymnasium, a comprehensive school or a secondary school (“Schule mit mehreren Bildungsgängen”); HE EQ/general school is the aggregated category for vignettes with this qualification from a Gymnasium or a comprehensive school.

General school, general education schools; VET school (relevant), VET schools that teach vocational knowledge and skills relevant to the field of the dual VET programme selected; VET school (not relevant), VET schools that teach vocational knowledge and skills not relevant to the field of the dual VET programme selected.

Results for variables reported in this article are highlighted in bold. The results for the other variables are not reported but are integrated into all the statistical models. There is, therefore, no effect on the quality of the experimental design. Abbreviation: HE EQ, higher education entrance qualification.

^a“Berufsfachschule”.

^b“Fachoberschule”.

^c“Berufliches Gymnasium”.

hypotheses, conditional logit models with cluster-robust standard errors are calculated (Chamberlain 1980; McFadden 1974). The clogit routine from the Stata 17 statistical software is used for this purpose. When estimating the models for H1–H3, only the vignette characteristics are taken into account; the focus is on the experimental factor type of school-leaving qualification. These research hypotheses are tested using specific pairwise comparisons defined a priori. For reasons of interpretability, average marginal effects (AMEs) are reported (Breen, Karlson, and Holm 2018).

The analyses of Hypotheses 4a and 4b are special cases due to the simultaneous comparison of different qualifications with different grades in a nonlinear model. To deal with these interactions properly, we have to contrast the predicted probabilities and cannot draw on the AMEs. Unfortunately, the conditional likelihood approach does not provide estimations of the fixed effect, which is necessary to consistently calculate the model-derived probabilities (Chamberlain 1980; Kitazawa 2012). We address this problem by using simple (unconditional) logistic regression models and add the choice-set indicator—in which the dependencies of the vignettes are coded—as a multinomial control variable. Based on these estimates, we then calculate the predicted probabilities and carry out the statistical tests. The comparison between the model estimates (AME) using conditional and unconditional logistic models indicates only minor differences and can be found in the appendix (Table A2).

For Hypotheses 5 and 6, interaction effects with grades and proportion of trainees in a VET programme are calculated (AME) using the appropriate conditional logit framework and presented in a graph to illustrate potential differences in the effects over the distribution of trainees with HE EQ.

4 | Results

The selection frequencies of the short profiles for interview depending on school-leaving qualification and school type are shown in Figure 2. The first trends are already apparent here: Applicants with a qualification from a vocational school obtained in a professional field that is not relevant to the VET programme are chosen to have the lowest selection frequency. This applies to the HE EQ_{general} (17%) and the HE EQ_{applied} (14%). The highest selection frequency is for the HE EQ_{applied} (56%) and the HE EQ_{general} (58%) obtained at a VET school in a professional field relevant to the VET programme.

The results of testing Hypotheses 1–3 are shown in Table 4. An overview of all the model estimates can be found in the appendix (Table A2). Differences between the AMEs given in the tables and the frequencies arise from the fact that not every school-leaving qualification can be included in the 90 sets equally distributed with all the other qualifications, and there are slight correlations due to the fractionalized designs, with the result that all the experimental factors are only largely (but not completely) independent of each other. To ensure a bias-free estimation of the parameters of interest, the other experimental factors were therefore integrated as control variables. The tables are read as follows: In general, the probability is tested that a

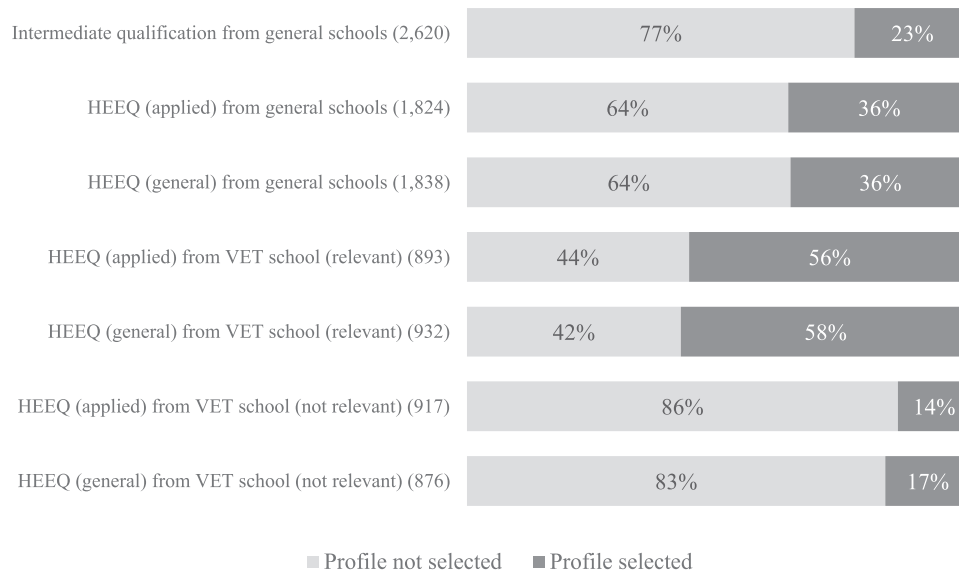


FIGURE 2 | Selection frequencies of individual profiles by school-leaving qualification and school type. *Note:* Absolute frequencies of vignettes with school-leaving qualifications and school types are given in brackets. HEEQ (applied): Higher education entrance qualification for a university of applied sciences. HEEQ (general): General higher education entrance qualification. General school: General education school. VET school (relevant): VET schools that teach vocational knowledge and skills relevant to the field of the dual VET programme selected. VET school (not relevant): VET schools that teach vocational knowledge and skills not relevant to the field of the dual VET programme selected. HEEQ, higher education entrance qualification; VET, vocational education and training.

vignette profile with a specific school-leaving qualification will be compared with another vignette profile with specific characteristics (see the columns under “Reference (...)”). The AMEs can be interpreted as percentage points when multiplied by 100.

Hypothesis 1: *We expect that among applicants from general education schools, a higher qualification leads to a greater probability of being invited for an interview than a lower qualification. To test this hypothesis, pair comparisons are carried out for a specific qualification with the next lower qualification. Applicants with a HEEQ_{applied} have a 19 percentage points better chance of being invited for an interview than applicants with an intermediate qualification. However, applicants with a HEEQ_{general} do not have a better chance than applicants with a HEEQ_{applied} but only a broadly similar chance. Although applicants with a HEEQ_{applied} have often attended school for 1 year less, this does not put them at any disadvantage. Hypothesis 1 is, therefore, only supported for the comparison of applicants with an intermediate qualification and those with a HEEQ_{applied} from a general education school.*

Hypothesis 2: *Here, we expect that applicants with a qualification from a VET school have a better chance of being invited for the interview than less highly qualified applicants from a general education school. This only applies to applicants who upgrade their qualifications obtained at a VET school in the professional field of the VET programme chosen. If this is the case, applicants with a HEEQ_{applied} have a better chance (AME = 0.48) than applicants with an intermediate qualification from a general education school, and applicants who upgrade to a HEEQ_{general} have better chances than applicants with a HEEQ_{applied} from a general education school (AME = 0.34). However, the opposite is the case if the VET school qualification is obtained in a professional field that does not correspond to the*

field of the VET programme chosen. In both cases, obtaining the VET school qualification is associated with disadvantages compared with applicants with a lower level of qualification from a general education school. This means that Hypothesis 2 cannot be confirmed in a general sense.

Hypothesis 3a: *This hypothesis assumes that the additional acquisition of professional knowledge relevant to the VET programme chosen represents an advantage compared with equally qualified applicants with only general school knowledge. This can be confirmed for applicants with a HEEQ_{applied} (AME = 0.33) as well as for applicants with a HEEQ_{general} (AME = 0.32). With Hypothesis 3b, we assumed that the acquisition of nonrelevant professional knowledge is at least not a disadvantage compared with just general knowledge. This hypothesis must be clearly rejected: Applicants with a HEEQ_{applied} (AME = -0.24) or a HEEQ_{general} (AME = -0.21) from a VET school who did not gain their qualification together with professional knowledge in the field of the desired VET programme are clearly at a disadvantage compared with equally qualified applicants from a general education school.*

An overview of the results for Hypotheses 4a–4c can be found in Table 5. Estimates and the results of the pairwise Wald tests are presented in Figures 3–5. With Hypotheses 4a–4c, we assume a reduction in the differences between differently qualified applicants with better grades. Hypothesis 4a (Figure 3a,b): Among applicants from a general education school, only those with an intermediate school-leaving qualification and an excellent GPA of 1.3 (predicted probability (PP) = 0.32) have significantly better chances of being invited for an interview than applicants with a HEEQ_{applied} and a GPA of 3.3 (PP = 0.16). Applicants with an intermediate qualification and a GPA of 2.3 have only a descriptive but not a significantly better chance than applicants

TABLE 4 | Overview of the results of H1–H3.

Hypothesis	Qualification and school type	Reference group qualification and school type					
		IQ from a general school		HEEQ _{applied} from a general school		HEEQ _{general} from a general school	
		AME	Std. Err.	AME	Std. Err.	AME	Std. Err.
H1	HEEQ _{applied} from a general school	0.192***	(0.030)	—	—	—	—
	HEEQ _{general} from a general school	—	—	0.015	(0.028)	—	—
H2	HEEQ _{applied} from a VET school (relevant)	0.478***	(0.026)	—	—	—	—
	HEEQ _{applied} from a VET school (not relevant)	−0.131***	(0.023)	—	—	—	—
H3	HEEQ _{general} from a VET school (relevant)	—	—	0.335***	(0.034)	—	—
	HEEQ _{general} from a VET school (not relevant)	—	—	−0.206***	(0.027)	—	—
	HEEQ _{applied} from a VET school (relevant)	—	—	0.330***	(0.037)	—	—
	HEEQ _{applied} from a VET school (not relevant)	—	—	−0.239***	(0.020)	—	—
	HEEQ _{general} from a VET school (relevant)	—	—	—	—	0.321***	(0.035)
	HEEQ _{general} from a VET school (not relevant)	—	—	—	—	−0.214***	(0.028)

Note: Intermediate qualification (IQ), “Realschulabschluss”; HEEQ_{applied}, higher education entrance qualification for a university of applied sciences (“Fachhochschulreife”); HEEQ_{general}, general higher education entrance qualification (“Abitur”).
General school, general education schools; VET school (relevant), VET schools that teach vocational knowledge and skills relevant to the field of the dual VET programme selected; VET school (not relevant), VET schools that teach vocational knowledge and skills not relevant to the field of the dual VET programme selected.
Results confirming the hypothesis are highlighted in bold.
Abbreviations: AME, average marginal effects; HEEQ, higher education entrance qualification; IQ, intermediate qualification; VET, vocational education and training.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

TABLE 5 | Overview of the results of H4a–H4c.

Hypothesis	Qualification and grade	Reference qualification and grade			
		IQ from a general school # 1.3	IQ from a general school # 2.3	HEEQ _{applied} from a general school # 1.3	HEEQ _{applied} from a general school # 2.3
H4a	HEEQ _{applied} from a general school # 1.3	↑	—	—	—
	HEEQ _{applied} from a general school # 2.3	↑	↑	—	—
	HEEQ _{applied} from a general school # 3.3	↓	○	—	—
	HEEQ _{general} from a general school # 1.3	—	—	○	—
	HEEQ _{general} from a general school # 2.3	—	—	○	○
	HEEQ _{general} from a general school # 3.3	—	—	↓	↓
	HEEQ _{applied} from a VET school (relevant) # 1.3	↑	—	—	—
H4b	HEEQ _{applied} from a VET school (relevant) # 2.3	↑	↑	—	—
	HEEQ _{applied} from a VET school (relevant) # 3.3	○	○	—	—
	HEEQ _{general} from a VET school (relevant) # 1.3	—	—	↑	—
	HEEQ _{general} from a VET school (relevant) # 2.3	—	—	↑	↑
	HEEQ _{general} from a VET school (relevant) # 3.3	—	—	○	○
	HEEQ _{applied} from a VET school (not relevant) # 1.3	↓	—	—	—
	HEEQ _{applied} from a VET school (not relevant) # 2.3	↓	↓	—	—
H4c	HEEQ _{applied} from a VET school (not relevant) # 3.3	↓	↓	—	—
	HEEQ _{general} from a VET school (not relevant) # 1.3	—	—	↑	—
	HEEQ _{general} from a VET school (not relevant) # 2.3	—	—	—	—
	HEEQ _{general} from a VET school (not relevant) # 3.3	—	—	↓	—

(Continues)

TABLE 5 | (Continued)

Hypothesis	Qualification and grade	Reference qualification and grade				
		IQ from a general school # 1.3	IQ from a general school # 2.3	HEEQ _{applied} from a general school # 1.3	HEEQ _{applied} from a general school # 2.3	
	HEEQ _{general} from a VET school (not relevant) # 2.3	—	—	→	→	
	HEEQ _{general} from a VET school (not relevant) # 3.3	—	—	→	→	

Note: Details of each statistical test can be found in Figures 3–5.

Abbreviations: HEEQ, higher education entrance qualification; IQ, intermediate qualification; VET, vocational education and training.

† Statistically significant advantage ($p < 0.05$) over reference.

↓ Statistically significant disadvantage ($p < 0.05$) against reference.

○ Statistically insignificant difference ($p \geq 0.05$).

with a HEEQ_{applied} and a poorer GPA (Figure 3b). Since there were no differences between applicants with a HEEQ_{applied} and a HEEQ_{general} from a general education school, we will only consider whether this result differs depending on the grade level (Figure 3c,d): Applicants with a HEEQ_{applied} and a very good (1.3, PP = 0.48) and good (2.3, PP = 0.49) GPA have a better chance of being invited for interview than applicants with a HEEQ_{general} and a GPA of 3.3 (PP = 0.18). In all, the results partly support Hypothesis 4a.

Hypothesis 4b: *We have seen that applicants from a general education school have significantly lower chances of being invited for interview compared with more highly qualified applicants with professional knowledge relevant to the chosen VET programme (see Hypothesis 2b). For applicants with an intermediate school-leaving qualification from a general education school, excellent or good grades lead to equal chances of being invited for interview compared with more highly qualified applicants from a VET school with a GPA of 3.3 (Figure 4a,b, the comparison is not statistically significant). Analogous similarities can be found for the comparison between applicants with a HEEQ_{applied} and better grades (GPA = 1.3/2.3) and applicants with a HEEQ_{general} and a GPA of 3.3 (Figure 4c,d). Hypothesis 4b is, therefore, again at least partly supported.*

Hypothesis 4c: *Our results have shown that applicants with a certain school-leaving qualification and professional knowledge acquired in a field not relevant to the chosen VET programme have significantly lower chances than less well-qualified applicants from a general education school. However, Hypothesis 4c predicted a decreasing advantage for better qualified applicants compared with less well-qualified applicants who have better grades. The prerequisite for Hypothesis 4c is therefore not true, and Hypothesis 4 and the tests are presented only for the sake of completeness (see Figure 5a–d).*

Hypothesis 5: *Here, we expect that differences in the probability of being invited for an interview between less well-qualified and more highly qualified applicants increase as the proportion of trainees with a HEEQ for a VET programme increases. Hypothesis 5a (differently qualified applicants from general education schools): As the proportion of trainees with a HEEQ obtained in a VET programme increases, the chances of applicants with a HEEQ_{applied} increase compared with those of applicants with an intermediate qualification (= zero line, Figure 6a). However, comparing applicants with a HEEQ_{general} and applicants with a HEEQ_{applied} from a general education school (zero line, Figure 6b), it is clear that the differences in the chances of being invited for interview do not change with an increase in the proportion of trainees with a HEEQ obtained in a VET programme. Hypothesis 5a is, therefore, only supported for applicants with an intermediate qualification. Hypothesis 5b (differently qualified applicants from a general education school and a VET school): The advantage of applicants with a HEEQ_{applied} with relevant professional knowledge compared with applicants with an intermediate qualification increases with an increase in the proportion of trainees with a HEEQ (Figure 6a). The disadvantage of applicants from a VET schools with knowledge in a nonrelevant field compared with applicants with an intermediate qualification decreases with an increase in*

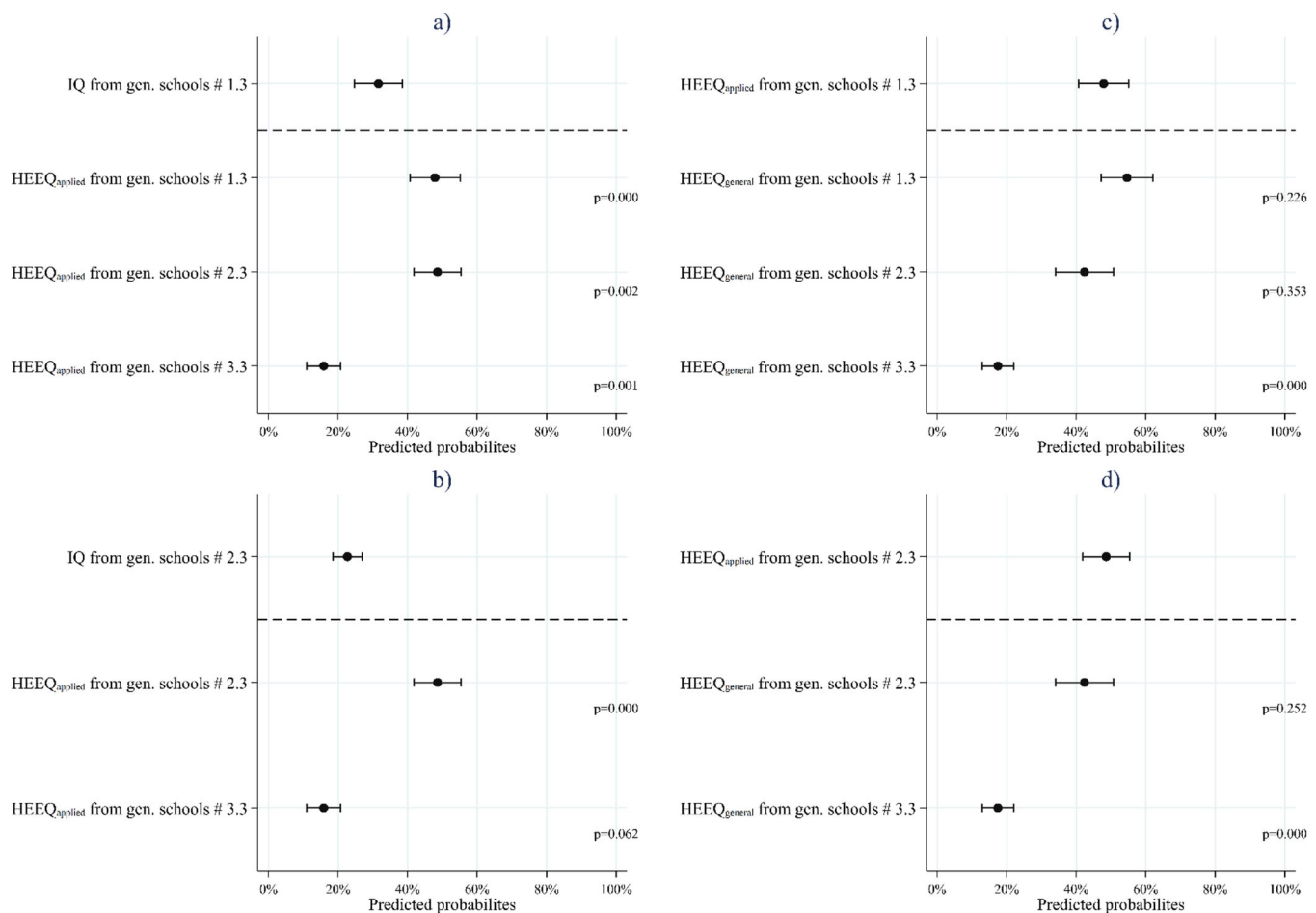


FIGURE 3 | Differently qualified applicants from general education schools with different grades (H4a). *Note:* The point estimate above the dashed line is the reference for the pairwise Wald tests, which are performed separately for each subgraph. (a) Applicants with an intermediate qualification and excellent grades compared to more highly qualified applicants. (b) Applicants with an intermediate qualification and good grades compared to more highly qualified applicants. (c) Applicants with HEEQ_{applied} and excellent grades compared to more highly qualified applicants. (d) Applicants with HEEQ_{applied} and good grades compared to more highly qualified applicants. The specific *p* value of the corresponding statistical tests is given at the end of each row. HEEQ, higher education entrance qualification; IQ, intermediate qualification.

the proportion of trainees with a HEEQ (Figure 6a). Both results indicate a devaluation of the intermediate qualification when there is an increase in the proportion of trainees with a HEEQ. Similarly, the advantage of applicants with a HEEQ_{general} and relevant professional knowledge compared with applicants with a HEEQ_{applied} increases when there is an increase in the proportion of trainees with a HEEQ (Figure 6b). These results support Hypothesis 5b. It is only for applicants with a HEEQ_{general} and nonrelevant knowledge and those with a HEEQ_{applied} that there is no difference in the probability of being invited for interview associated with an increase of trainees with a HEEQ (Figure 6b).

Hypothesis 6a: Here, we expect that the advantage of applicants with professional knowledge relevant to the chosen VET programme compared with equally qualified applicants from a general education school decreases as the proportion of trainees with a university entrance qualification increases. This hypothesis is supported neither for applicants with a HEEQ_{applied} from a VET school compared with equally qualified applicants from a general education school (zero

line, Figure 7a) nor for applicants with a HEEQ_{general} from a VET school compared with equally qualified applicants from a general education school (zero line, Figure 7b). In Hypothesis 6b, we expect that differences between applicants from a general education school and equally qualified applicants with professional knowledge not relevant to the chosen VET programme chosen increase with the proportion of trainees with a HEEQ obtained in a VET programme. Again, this hypothesis cannot statistically be confirmed, neither for the comparison with applicants with a HEEQ_{applied} (Figure 7a) nor for the comparison with applicants with a HEEQ_{general} (Figure 7b).

5 | Summary and Discussion

We started with the assumption that among graduates from general education schools, a higher school qualification is an advantage in the application for an attractive dual VET programme. Our aim was to examine what strategies can improve the chances of being invited for interview and how education-

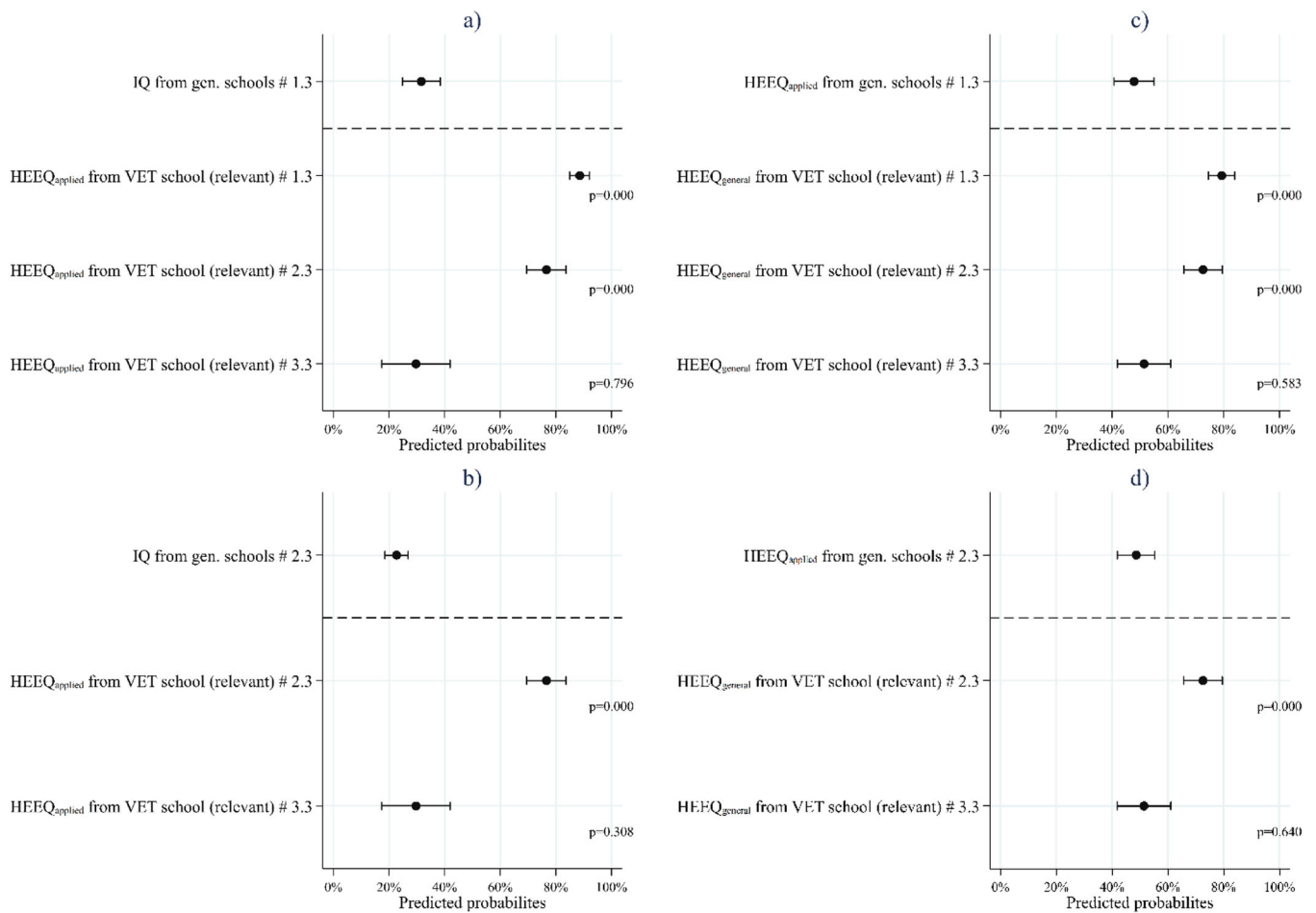


FIGURE 4 | Differently qualified applicants from general education and VET schools (relevant) with different grades (H4b). *Note:* The point estimate above the dashed line is the reference for the pairwise Wald tests, which are performed separately for each subgraph. (a) Applicants with an intermediate qualification and excellent grades compared to more highly qualified applicants. (b) Applicants with an intermediate qualification and good grades compared to more highly qualified applicants. (c) Applicants with HEEQ_{applied} and excellent grades compared to more highly qualified applicants. (d) Applicants with HEEQ_{applied} and good grades compared to more highly qualified applicants. The specific *p* value of the corresponding statistical tests is given at the end of each row. HEEQ, higher education entrance qualification; IQ, intermediate qualification; VET, vocational education and training.

related signals are perceived by HR professionals depending on the attractiveness of the VET programme. We must separate our results for general education graduates with an intermediate qualification from those with a HEEQ_{applied}. Graduates with an intermediate qualification have a 19% lower chance of being invited for interview for an attractive VET programme than graduates with a HEEQ_{applied}. This disadvantage can be compensated for if applicants with an intermediate qualification have a GPA of 1.3 or 2.3, and they then compete with holders of a HEEQ_{applied} with a poorer GPA of 3.3.

However, it would be even more advantageous for graduates with an intermediate qualification to upgrade to a HEEQ_{applied} at a VET school. When making this decision, the future VET programme should already be taken into account: If the HEEQ_{applied} is obtained in a professional field that does not correspond to the VET programme subsequently chosen, the chances of being invited are even 13 percentage points lower compared with less well-qualified applicants with an intermediate qualification from a general education school, and

this disadvantage cannot be compensated for by better grades. However, the investment of educational upgrading does not pay off if students leave the VET school with a GPA of 3.3 and have to compete with less well-qualified applicants with better grades. Upgrading to a HEEQ_{applied} is particularly important for graduates from a general school with an intermediate qualification who apply for a very attractive VET programme with a high proportion of trainees who have a HEEQ. Our results clearly indicate that an increase in the proportion of trainees in a VET programme who have a HEEQ is accompanied by an increasing devaluation of an intermediate qualification.

The situation is slightly different for applicants who left general education with a HEEQ_{applied}. There are no disadvantages here compared with applicants who left general education with a HEEQ_{general}, although the latter group usually attended school for 1 or even 2 years longer and therefore accumulated more general education knowledge. Once again, applicants with a HEEQ_{applied} can improve their

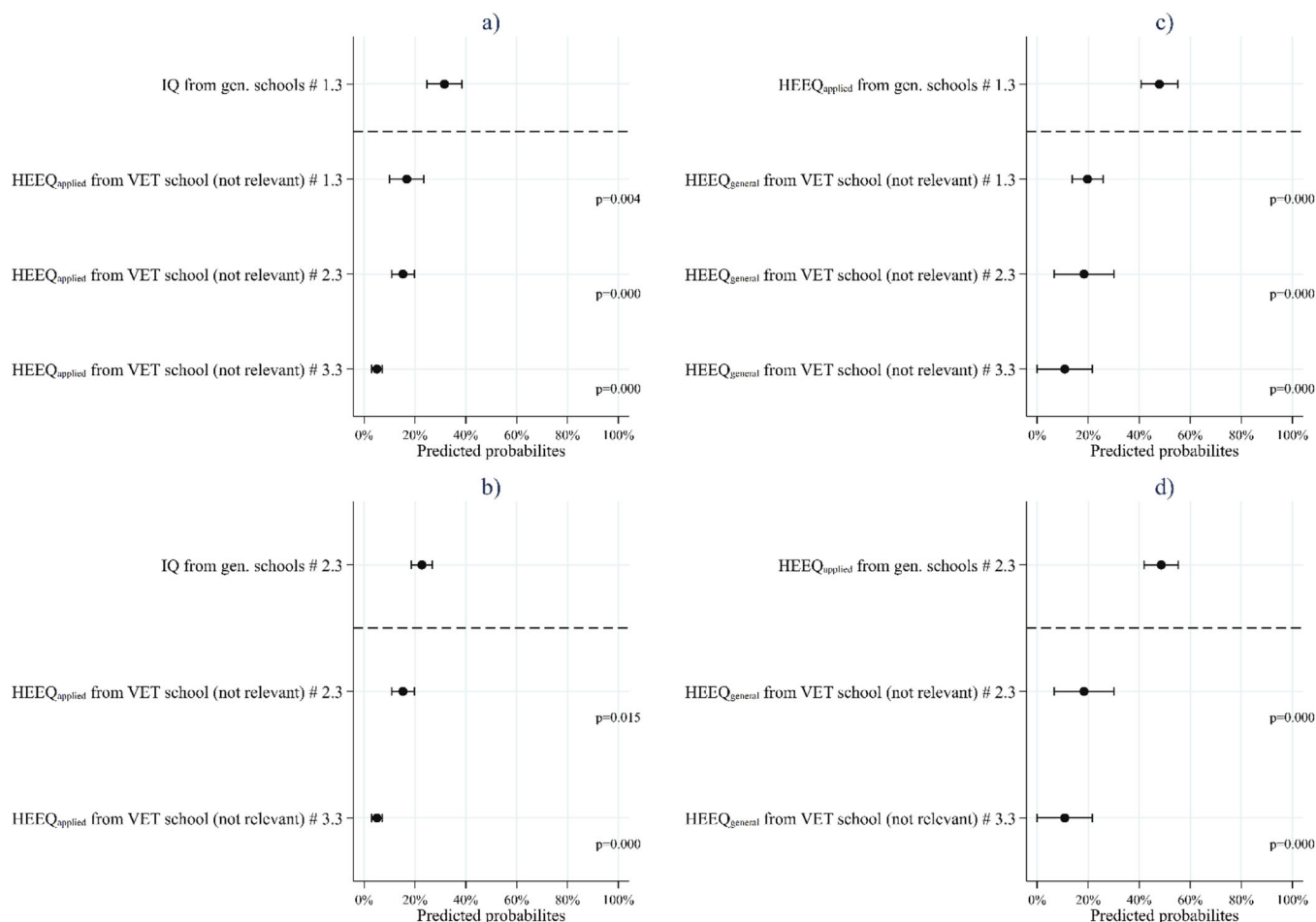


FIGURE 5 | Differently qualified applicants from general education and VET schools (not relevant) with different grades (H4c). *Note:* The point estimate above the dashed line is the reference for the pairwise Wald tests, which are performed separately for each subgraph. (a) Applicants with an intermediate qualification and excellent grades compared to more highly qualified applicants. (b) Applicants with an intermediate qualification and good grades compared to more highly qualified applicants. (c) Applicants with HEEQ_{applied} and excellent grades compared to more highly qualified applicants. (d) Applicants with HEEQ_{applied} and good grades compared to more highly qualified applicants. The specific *p* value of the corresponding statistical tests is given at the end of each row. HEEQ, higher education entrance qualification; IQ, intermediate qualification; VET, vocational education and training.

chances of being invited for interview, in this case by 34 percentage points, if they upgrade to a HEEQ_{general} at a vocational school in a professional field relevant to the subsequently chosen VET programme. Graduates who leave a VET school with a GPA of 3.3 do not improve their chances compared with less well-qualified applicants with a higher GPA, but they do have a better chance than less well-qualified applicants with an identical GPA. Although applicants with a HEEQ_{applied} from a general education school increase their chances if they choose a programme in a professional field that is relevant to the desired VET programme, this does not increase their chances of being invited for interview for a highly attractive VET programme with a high proportion of trainees who have a HEEQ.

Our study has some limitations. A critical comment that is usually levelled at (online) choice experiments relates to the hypothetical selection decisions and thus addresses the external validity of the survey. One strategy for increasing the external validity of our results lies in the specific selection of the

respondents. The target group for the experiment consists of HR professionals who are regularly entrusted with reviewing applications and should, therefore, have the appropriate expertise and heuristics for comparing written CVs. In addition, DCEs are comparatively well supported by theoretical and statistical decision models (Auspurg and Liebe 2011). Validation studies have so far shown great agreement regarding the relative effects between online vignette studies and analogous real experiments (Petzold and Wolbring 2019; Hainmueller, Hangartner, and Yamamoto 2015).

Our findings are of practical relevance for career counselling at schools. In an evaluation of the PISA results, the OECD shows how important intensive career counselling is not only for the fit between interests, skills and career choice but also for later income levels (Mann et al. 2020). More recently, the growing shortage of skilled workers has increased political and economic pressure for a rapid transition from school to VET programmes (OECD 2021). However, our results show that it is worthwhile to obtain a higher school

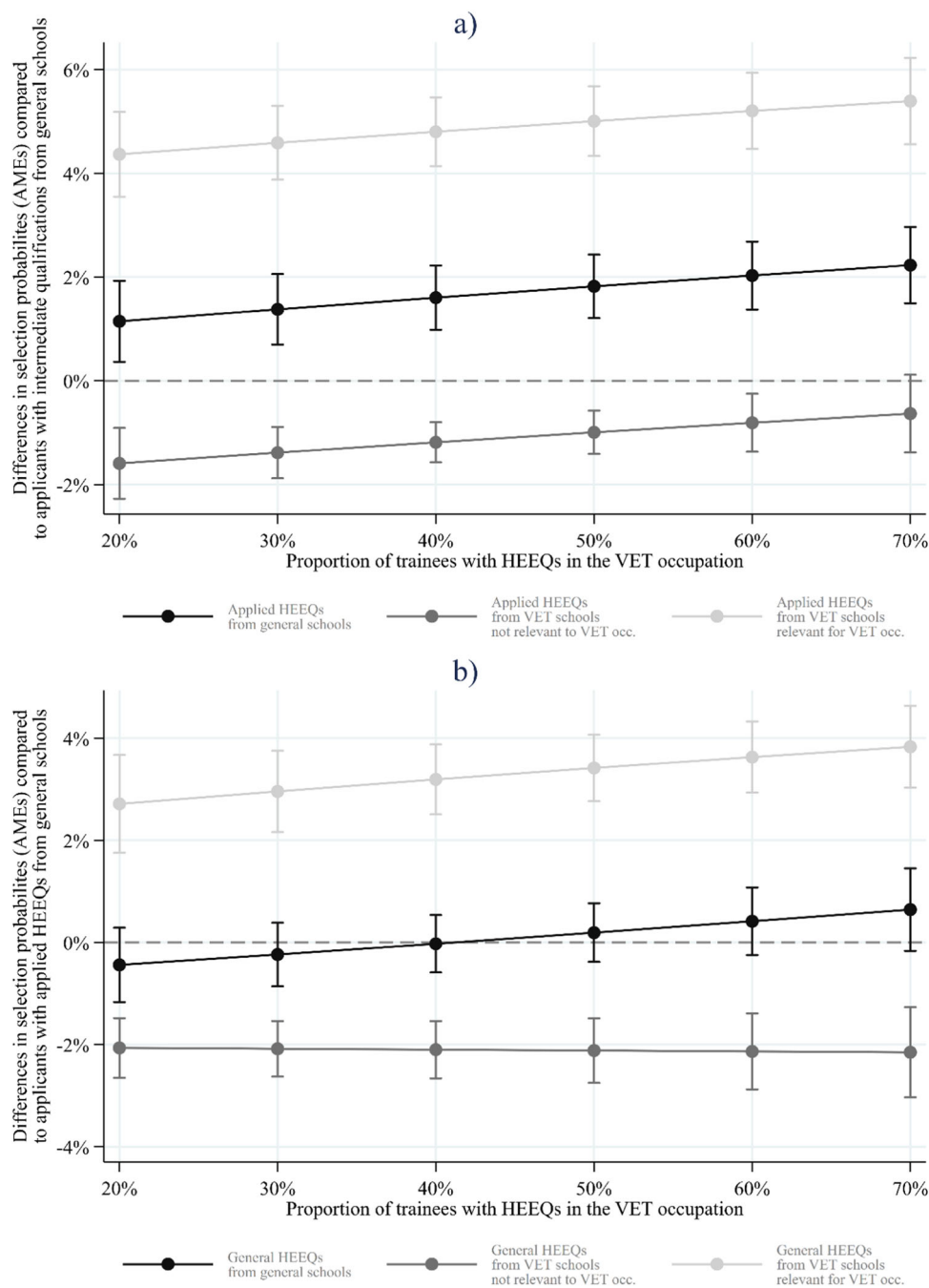


FIGURE 6 | Differences in invitation probability for differently qualified applicants from general education and VET schools and proportions of trainees with a HEEQ in dual VET programme (H5). (a) Applicants with intermediate qualification and HEEQ_{applied}. (b) Applicants with HEEQ_{applied} and HEEQ_{general}. AME, average marginal effects; HEEQ, higher education entrance qualification; VET, vocational education and training.

qualification. Fitzenberger, Hillerich-Sigg, and Sprietsma (2019) have similarly found that in Germany school-based career counselling, other than counselling by the employment agency, often leads to educational upgrading at a vocational school. Since our findings indicate that educational upgrading improves the career perspectives of young people (see also Rahn and Fuhrmann 2023), the role and the resources of school counsellors should be strengthened.

It may be that such a decision for educational upgrading also serves to delay a decision for a specific VET programme

(Schwarz, Anger, and Leber 2020). Our results clearly show that the choice of a vocational field at a vocational school is very important for one's future career. A decision at the end of lower secondary school to obtain a higher school qualification must, therefore, be seen in connection with later vocational training decisions. The role of school career counsellors is, among other things, to identify students who want to delay vocational training decisions due to uncertainty and to help them to find the vocational fields in which their skills and interests lie. In this way, they ensure that students do not have to suffer the disadvantages of a lower

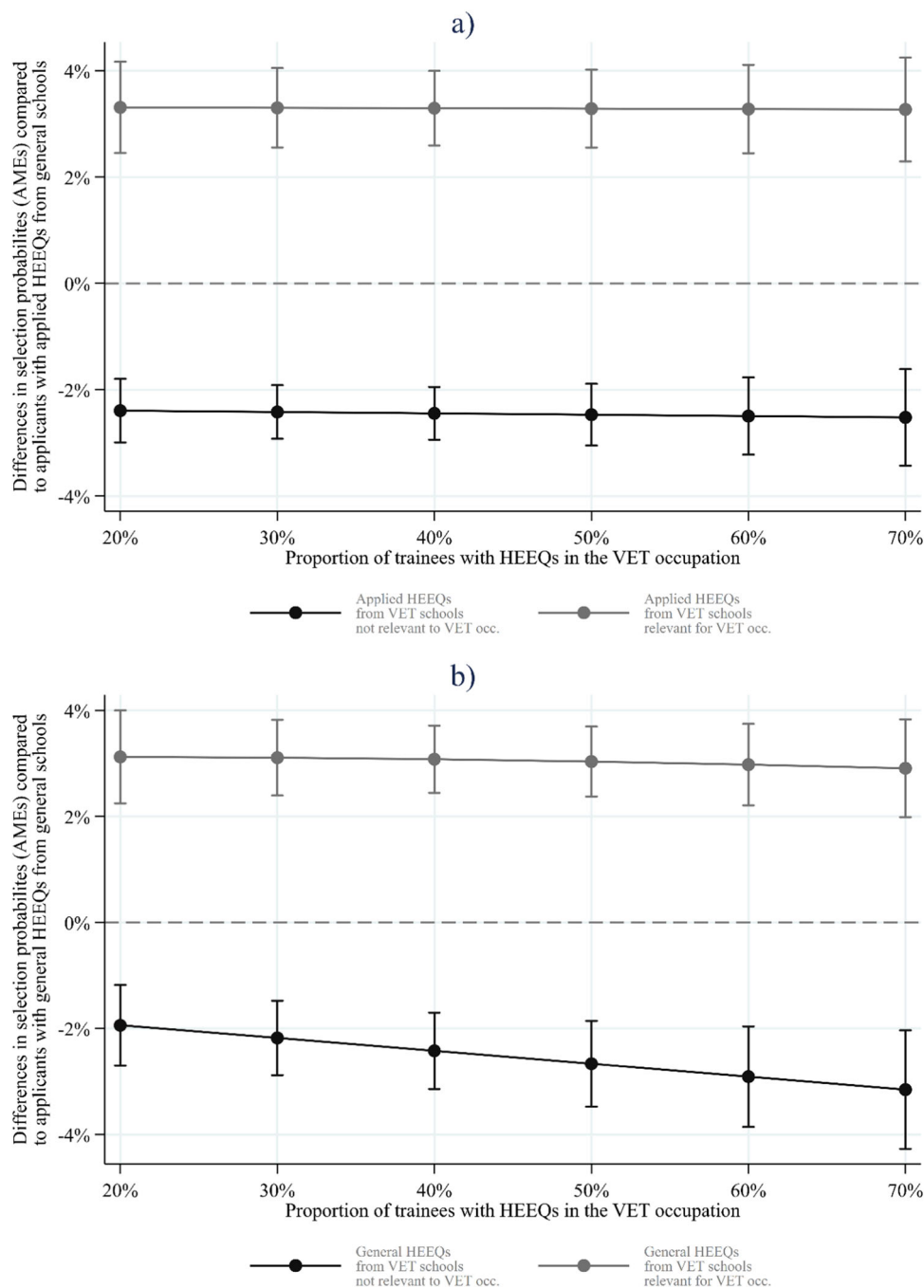


FIGURE 7 | Differences in invitation probability for equally qualified applicants from general education and VET schools and proportions of trainees with a HEEQ in dual VET programme (H6). (a) Applicants with HEEQapplied. (b) Applications with HEEQgeneral. AME, average marginal effects; HEEQ, higher education entrance qualification; VET, vocational education and training.

qualification but instead become actors in their educational and vocational biography.

Acknowledgements

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Data Availability Statement

For data availability see Schimke 2024; see also Schimke 2023, Schuchart and Schimke 2024.

Endnotes

¹Aggregation does not affect the validity of the experimental design for parameter estimates of main and interaction effects of interest.

²Can be shown by $\binom{1092}{3} = \frac{1092!}{3!(1092-3)!}$.

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Appendix

TABLE A1 | Empirical evaluation of the VET school programme classification by VET occupation.

	VET schools (to upgrade to a HEEQ _{applied})				VET schools (to upgrade to a HEEQ _{general})			
	Not relevant		Relevant		Not relevant		Relevant	
	N	MW (SD)	N	MW (SD)	N	MW (SD)	N	MW (SD)
Business(wo)man for wholesale and foreign trade management	30	2.7 (0.8)	16	4.1 (0.8)	27	2.5 (1.0)	24	4.2 (0.7)
IT specialist	28	2.6 (0.8)	28	3.8 (0.7)	32	2.2 (0.7)	35	4.0 (0.6)
Carpenter	9	2.3 (1.2)	13	3.7 (0.6)	17	2.1 (0.7)	18	3.6 (0.8)
Legal assistant	29	2.3 (1.1)	27	3.6 (1.0)	28	2.6 (1.0)	34	3.7 (0.8)
Social security clerk	2	2.5 (0.7)	6	3.8 (0.8)	5	3.2 (0.8)	3	3.7 (0.6)
Industrial clerk	28	2.4 (0.8)	18	4.1 (0.7)	29	2.9 (0.8)	25	4.3 (0.7)
Hotel specialist	20	2.7 (0.9)	15	3.9 (0.8)	17	2.7 (0.9)	33	3.5 (0.7)
Office management assistant	33	2.6 (0.9)	34	4.2 (0.7)	18	2.3 (1.0)	42	3.9 (0.8)
Bank clerk	16	2.6 (0.6)	18	3.9 (0.6)	23	2.7 (1.0)	22	3.9 (0.8)
Medical assistant	17	2.5 (0.6)	20	3.9 (0.7)	17	2.2 (0.8)	22	4.1 (0.8)
Total	212	2.5 (0.9)	195	3.9 (0.8)	213	2.5 (0.9)	258	3.9 (0.8)

Note: The experimental module of the survey was followed by an empirical evaluation of the not relevant/relevant classification defined a priori. For this purpose, one vignette was randomly selected from all the vignettes presented to the respondents that contained a profile with a qualification from a VET school and the respondents were asked to assess the relevance of the VET school programme for the training occupation.

Question and item: In the decision scenarios, you saw an application with a qualification from a VET school among others. How relevant does this programme seem to you with regard to the training content (training occupation)? The knowledge acquired at a VET school in this programme can be usefully applied in the dual VET programme.

Rating scale: 1 = do not agree at all; 2 = do not agree; 3 = partly/partly agree; 4 = agree; 5 = fully agree.

Abbreviations: HEEQ, higher education entrance qualification; IT, technology specialist; VET, vocational education and training.

TABLE A2 | Conditional and unconditional logit regression models.

Dependent variable: Vignette selection(1 = Selected; 0 = Not selected)	Conditional logit		Unconditional logit ^a	
	AME	Std. Err.	AME	Std. Err.
<i>School-leaving certificate and school type</i>				
IQ/general school	Reference		Reference	
HEEQ _{applied} /general school	0.192***	(0.030)	0.160***	(0.024)
HEEQ _{general} /general school	0.209***	(0.034)	0.176***	(0.028)
IQ/VET school (relevant)	0.222***	(0.048)	0.189***	(0.046)
IQ/VET school (not relevant)	−0.173***	(0.029)	−0.113***	(0.019)
HEEQ _{applied} /VET school (relevant)	0.478***	(0.026)	0.491***	(0.033)
HEEQ _{applied} /VET school (not relevant)	−0.131***	(0.023)	−0.088***	(0.017)
HEEQ _{general} /VET school (relevant)	0.481***	(0.022)	0.497***	(0.028)
HEEQ _{general} /VET school (not relevant)	−0.075	(0.047)	−0.052	(0.033)
<i>Grade point average</i>				
1.3	Reference		Reference	
2.3	−0.085***	(0.021)	−0.084***	(0.020)
3.3	−0.337***	(0.026)	−0.296***	(0.022)
<i>Gender</i>				
Female	Reference		Reference	
Male	−0.017	(0.021)	−0.016	(0.020)
<i>Migration background</i>				
German first and last name	Reference		Reference	
German first name and Turkish last name	−0.023	(0.031)	−0.022	(0.030)
German first name and Polish last name	−0.027	(0.033)	−0.026	(0.032)
Turkish first and last name	−0.011	(0.036)	−0.011	(0.035)
Polish first and last name	−0.051	(0.027)	−0.049	(0.026)
Turkish first name and German last name	−0.016	(0.030)	−0.016	(0.029)
Polish first name and German last name	−0.032	(0.033)	−0.030	(0.032)
<i>Age</i>				
Normal	Reference		Reference	
Older	0.044	(0.024)	0.042	(0.023)
Log pseudolikelihood	−5914.1		−6137.2	
McFadden's pseudo- <i>R</i> ²	0.144		0.141	
<i>N</i> _{vignettes}	11,469		11,469	
<i>N</i> _{Recruiters}	1308		1308	

Abbreviations: AME, average marginal effects; HEEQ, higher education entrance qualification; IQ, intermediate qualification; VET, vocational education and training.

^aEstimates for the 90 categories of the choice-set indicator are not presented.

p* < 0.05; *p* < 0.01; ****p* < 0.001.