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INEQUALITY IN VOCATIONAL EDUCATION AND TRAINING – A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Vocational Education and Training (VET) has a wide range of issues related to its implementation. VET processes and outcomes still have elements of inequality. However, existing research on inequality in VET is very heterogeneous. To identify, evaluate, and summarize the findings of all studies about inequality in VET, thereby making the available evidence more accessible to decision-makers, we conducted a systematic literature review. Using the systematic literature review method, a total of 8.892 studies were found, and 46 studies were selected based on the specified criteria. The relevant studies analyzed showed that inequality in VET includes inequalities experienced by marginalized international students, immigrants, refugees, people with disabilities, gender, labor markets and opportunities, and wages. Efforts need to be made to reduce inequality by reviewing policies, improving curricula and learning processes, and evaluating learning in VET. The knowledge generated about inequality in VET can provide a valuable basis for improving VET. This article presents a substantial starting point and research agenda for further studies on VET.

Keywords: vocational education and training, VET, inequality, systematic literature review

Introduction

Vocational education and training are important in the field of vocational education. Vocational education is a form of education that focuses on preparing students' competencies for work (Suharno et al., 2020). With the globalization of the economy, the labor market has also become global (Huang & Jung, 2020). It is necessary to prepare skilled vocational school graduates. VET aims to enable students to participate in debates and controversies in society and their field of occupational practice as a basis for their participation in a democratic society. This is not an argument for induction into the discipline (or applied discipline) as an eternal truth (Wheelahan, 2015).

Considering the importance of this topic in terms of research, practice, and policy, the main objective of this article is to identify, evaluate, and summarize the findings of all studies about inequality in VET, thereby making the available evidence more accessible to decision-makers, we conducted a systematic literature review. The authors systematically analyze the current state of international research on VET inequality from a multidisciplinary and multilevel perspective using the "systematic literature review" method. The identification of thematic and methodological foci, as well as semantic and/or structural relationships between different approaches, theories, and best practice models, is the focus of this article.

Conceptualizing VET Inequality

To provide a comprehensive and structured overview of the current state of VET inequality and to analyze multidisciplinary perspectives on VET inequality. As a first step, it is necessary to define the meaning of the core concept in this article, "Inequality in VET". Inequality can be defined as inequalities by social background, inequalities by race, inequalities by ethnicity, inequalities by immigrant status, and inequalities by gender (Blanden, 2020). The way to reduce inequalities can be through education and skill development (Tyagi et al., 2020). In the field of education, especially VET, inequality also occurs. Inequality occurs because there are factors that do not work properly. Based on this explanation, it is necessary to have a systematic literature review on inequality in VET to provide a comprehensive and structured overview. This systematic literature review on inequality in VET is useful for identifying, evaluating, and summarizing the findings of all studies about inequality in VET, thereby making the available evidence more accessible to decision-makers.

Methodology

Systematic literature review activity is a literature review method. In this context, Linnenluecke et al. (2020) highlighted the benefit of a systematic literature review is to collect sufficient evidence systematically and evaluate it based on criteria. This article presents a systematic analysis of the current state of international research on VET inequality from a multidisciplinary and multilevel perspective, following Gessler & Siemer (2020). According to its category definition, a systematic literature review includes the following four steps: (1) scope definition, (2) data selection, (3) data processing, and (4) data reporting (Gessler & Siemer, 2020).

Data Collection

The data collection process and procedure of systematic literature review by Gessler & Siemer

(2020):

Scope Definition

The scope definition defines the research problem and derives the main research questions. In this literature review, the authors systematically analyzed theoretical-conceptual and empirically oriented research on VET inequality from a multidisciplinary and multilevel perspective. The identification of thematic and methodological foci, as well as semantic and/or structural relationships between different approaches, theories, and best practice models, is the focus of this article. In addition, indications of international networks and potential synergies in the field of research are considered. The main objective of this literature review is to analyze the state of VET inequality and structure future VET opportunities.

Data Selection

The next step was data selection, which required a systematic search and eligibility screening for the articles used. Sources must be determined, and relevant research must be selected, screened, and read, while ineligible research must be excluded. The determination of relevant sources is done through a multi-step approach. The step of finding relevant and reliable sources uses relevant databases such as Scopus, ERIC, ScienceDirect, and Semantic Scholars. The first process is to search for relevant sources through keywords and the right combination of keywords to find relevant publications. In the literature search, the keywords we used were "inequality, VET" in the Scopus search. This procedure also generates many search results, as irrelevant literature is inevitable in the search list.

Data Processing

In the third step of data processing, we focus on assessing the quality of the selected literature to weed out inappropriate literature search results, select relevant data from Scopus, and critically evaluate the selection of relevant literature. The relevant literature search process (Table 1) was obtained from articles that met the keywords inequality and VET in the Scopus search. The result of identifying relevant literature was 8.892 articles. A number of these articles were filtered by qualifying articles in the 2014-2023 timeframe, so 3.958 articles were obtained. From this number, the articles were filtered with articles that had social science subject areas, and the results were 2.129 articles. The determination of the subject area in the field of social science is relevant to the purpose of this research. From these results, 682 articles have document types in the form of articles. Next, we filtered articles that were in English. This left 137 articles. The last filtering step is articles that have PDF files. This left 46 suitable or most relevant articles used in the systematic literature review of this article.

Table 1. Selection of Literature Guided by Criteria

Data basis	Results	Years	Subject area	Document	In English	PDF file
Scopus	98	78	70	52	43	36
ERIC	7	4	1	1	1	1
Science Direct	8.494	3.759	1.909	533	2	2
Semantic Scholars	293	117	149	96	91	7
Total	8.892	3.958	2.129	682	137	46

Data Reporting

The final step in the systematic literature review is data reporting, which conveys the findings and implications as well as the limitations of the review and the discussion of conclusions. In this section, several studies are presented with theoretical studies in mind. Key findings and implications are presented and discussed. Then, the last step of the data reporting section is the presentation of limitations.

Results

The Current State of VET Inequality

The few systematic reviews and evaluations of VET inequality indicate significant research gaps. Therefore, the main objective of this systematic literature review is to analyze and compile a knowledge base to describe VET inequality, as well as to conduct a downstream analysis of the contextual conditions and determinants (challenges, opportunities for improving VET inequality). In the following section, the key findings are summarized, and their implications for our research objectives are discussed.

Key Findings

In this section, we present relevant studies from the 46 articles included in our systematic literature review (see Table 2 in the appendix) addressing this topic at different levels. The majority of the 46 included are related to inequality in VET. All studies, regardless of their specific focus on inequality in VET, were initially included in the mapping procedure. To collate the studies' data and their findings, we summarized them and presented inequality on VET. Afterward, the studies were categorized based on their methodological approach, identifying 14 studies that addressed the topic of inequality in VET at the theoretical literature review level and 32 studies that addressed the topic empirically (see Table 2 in the appendix). In this literature review, inequality in VET is discussed in terms of education in VET and inequality in VET.

Discussion

The Implementation of VET Education

The education process at vocational schools provides practical learning for students. The benefits of vocational education are important for students' future. Education also plays an important role in wage determination. Ebner (2015) conducted a study with the results of wage differences between education groups of various levels in Germany. The highest level of education among respondents was categorized into four categories: no vocational training, dual vocational training, vocational further education, and higher education.

The contribution of vocational education and vocational training (TVET) also affects graduates. Hilal (2017) conducted research and found that the contribution of TVET to empowering young Palestinian graduates who face marginalization and inequality is that it can provide opportunities for graduates to improve their abilities and gain various indicators of empowerment, such as household decisions and participation in public life. This indicates that the role of VET is very important for graduates. It is also possible that wider regional learning

opportunities will increase the probability of students enrolling in general education programs. Conversely, limited learning opportunities will increase the probability of students enrolling in vocational education programs (Glauser & Becker, 2016). The tendency for students to join vocational education programs exists when learning opportunities are limited. This is in line with the finding that individuals who come from families with better access to education have a higher likelihood of attending higher academic education, but higher vocational education provides more inclusive access, although participants and employers privately fund it (Nägele et al., 2018).

In terms of the learning process in vocational schools, it is important to start with the curriculum used. The main purpose of curriculum theory in VET should be 'what is taught and learned in VET', which is the basis for distinguishing between academic and vocational curricula. The curriculum in VET includes knowledge, the distinction between theoretical and everyday knowledge and between different types of theoretical knowledge, the relationship between knowledge and skills, and the implications of this relationship for the VET curriculum and the conditions under which students access and integrate knowledge and skills (Wheelahan, 2015). Different countries have their own decisions regarding VET curriculum policies. Current curriculum policies and trends in Finland, Iceland, and Sweden are dominated by neo-liberal discourses that emphasize principles such as "market relevance" and employability skills. This trend reinforces the separation between academic and vocational education, particularly through the organization of knowledge in vocational programs that separates it from more general and theoretical elements (Nylund et al., 2018). In addition, an important thing in curriculum development is the role of curriculum developers. Curriculum development can involve stakeholders and industry or employers to determine a subject matter that suits industry needs. A common approach in curriculum development or shaping higher vocational education outcomes is where the stakeholders involved are more diverse, or the process is conducted at the national level with employers intended to represent not only their own companies (Köpsén, 2020).

Aspects of Inequality in VET

Various disparities exist regarding VET. An analysis of 46 articles revealed that inequalities in VET exist in a variety of ways. Course-related work experience and access to it are uneven across institutions and inconsistently implemented in the VET sector.

International Students

Vocational education is expected to provide real-world work skills for students, including international students. For international students, they must be capable of spatial movement to be able to produce new conditions and possibilities for them in the industrial world (Tran, 2015). International students are marginalized due to their lack of power, social networks, and cultural capital in negotiating course-related work experience (Tran & Soejatminah, 2017). One of the inequalities in VET is that international students. It is because they lack power. After all, they are international students who come from abroad. Social network factors also have an impact on inequality, international students are students who have just come to a new environment, so there is still inequality that occurs.

Immigrant Status

Another gap is that migrant students have a higher propensity to enter academic education by eight percentage points. Migrants from Spain or Portugal have a 10-percentage point higher propensity to choose academic education compared to native Swiss. Immigrant optimism explains about 18% of this ethnic choice effect. As mentioned earlier, the baseline difference is striking, especially for migrants from the Balkans/Turkey, at 13 percentage points; 23% is explained by immigrant optimism (Tjaden & Scharenberg, 2017). Related to other migrants, the difference between migrant students and German students is smaller at lower ability levels. High-achieving migrant students are much less likely than high-achieving German students to access vocational education (Tjaden, 2017). In European countries, immigrant youth tend to prefer academic education over vocational education and training (VET) compared to natives, who have higher participation rates in academic pathways at the upper secondary level and less often choose VET after completing lower secondary and upper secondary education, and more often switch to higher education after achieving an upper secondary degree (Busse & Scharenberg, 2022).

Refugees

Inequalities also exist for refugees. The educational process of refugees in vocational education in Germany is related to their place of residence, and the proportion of refugees who successfully made the transition to vocational education within the observation period is lower compared to natives or citizens with a migration background but not refugees (Meyer & Winkler, 2023). In Europe, refugees' access to Vocational Education and Training (VET) is linked to race, which serves as a powerful political category (Chadderton & Edmonds, 2015).

The existence of inequalities, according to teacher analysis, reveals how knowledge sharing, stratification of secondary education, school grammar, and learning culture are interconnected and contribute to explaining how the organization of secondary schools impacts the (re)production of social inequalities (Tarabini & Jacovkis, 2022). Regarding inequality among students, VET students in Turkey have socio-economic disadvantages in various aspects, including family income, parental education level, and family employment status. Although the percentage of low-income students increases in all types of schools over time, it is consistently higher in VET students compared to other secondary school students. In addition, students' initial achievement and their socio-economic status have a significant impact on students' achievement in secondary school (Suna & Özer, 2021).

Labor markets and opportunities

Inequalities also exist in Germany, where the vocational training system is highly structured, resulting in social inequalities in employment opportunities. Students from lower social classes more often enter the vocational training system than higher education, even if they have a university entrance diploma. Moreover, in the vocational training system, access to training in general and interesting jobs in particular is highly dependent on school attainment, which is highly correlated with social class and parental educational background, as reported in various PISA studies (Protsch & Solga, 2016). Inequalities in early career labor market outcomes among individuals who have undergone various programs where variations in skills and knowledge acquired through VET affect individuals' long-term labor market allocation (Grønning & Kriesi, 2022).

Gender and geographical

Gender inequalities and geographical limitations exist in VET Africa, where a major challenge is the dominance of economic thinking in development thinking and the need for active engagement in economic transformation in Africa and Africa's relations with other countries (McGrath, Powell, et al., 2020). The persistence of gender stereotypes in the understanding of young women's professional abilities in apprenticeship programs in male-dominated career fields (Makarova et al., 2016).

Wages

Inequality also occurs in wages. VET graduates with an Abitur (high school diploma) generate almost twice as high a return on salary as VET graduates without an Abitur. VET graduates without Abitur experience higher salary inequality. In addition, the level of previous education also affects salaries in Germany (Friedrich & Hirtz, 2021b).

The widening gap in VET in the U.K. reflects the country's growing inequality. A more practice-focused approach to workplace learning may increase the reproductive role of educational practice that vocational education actors generally desire. This reinforces class divisions in VET if the U.K. moves further away from the European social model and is more likely to adopt a more extreme liberal version of the market economy. In addition, the COVID-19 pandemic may reinforce the shift from classroom learning to workplace learning, especially if this is seen as helping the country's limited finances. It also raises questions about what jobs and which aspects of work should be rewarded, and, therefore, what educational preparation they need and deserve (Esmond & Atkins, 2020). The gap in education and employment outcomes for Indigenous Australians, despite efforts to provide appropriate academic, social, and cultural support, is often an inadequate and under-resourced model (Cameron et al., 2017).

People with disabilities

VET in a country with a highly compressed wage structure, a strong VET system benefits students who are unlikely to go on to higher education (Birkelund & van de Werfhorst, 2022). In addition, disparities also exist where elites generally dominate prestigious technical and professional courses due to better accessibility and affordability, while the vulnerable miss out on many of these (Bazaz & Akram, 2022). Inequalities also exist in the vocational education (VET) attainment of individuals with disabilities and how this differs compared to self-reported people without disabilities, as well as in relation to other levels of education (Pullman, 2019).

There is also the issue of participants choosing training occupations that do not match their realistic occupational aspirations (Schels et al., 2022). This creates an imbalance where students choose jobs that do not match their competencies. Han's research in Singapore and the U.K. found higher scores on political self-efficacy, collective (school) efficacy, and future choice intentions among vocational students in Singapore compared to students in the U.K. Then the lowest performing students in Singapore had higher scores in intention to vote in the future compared to the U.K. student group (Han et al., 2014).

VET is also related to internships. Internships certainly produce high-quality graduates. However, there is a concern about the impact of internships, namely the dropout rate. This dropout rate is likely the result of employers preferring internship applicants who are like them

or that child welfare clients lack networks (Dæhlen, 2017). This inequality also stems from rational selection factors and educational expectations from social groups (Busse et al., 2023a).

One of the solutions that can be implemented is the need for new approaches in VET research to involve various fields of study (McGrath & Powell, 2016). One approach that can be used is the "critical capabilities approach in vocational education and training" (CCA-VET), a new approach that combines critical ontology, epistemology, and methodology (McGrath, Powell, et al., 2020). In addition, the need for the role of relevant stakeholders is very important. The role of employers is also related to VET. Fleckenstein conducted a study with the result that powerful employers violate government policies related to vocational skill formation. This indicates that Korea's political economy does not facilitate the inter-firm cooperation necessary for collective skill formation (Fleckenstein et al., 2023). The role of parents in VET is that children are more likely to receive dual apprenticeship training when their parents have more native labor market contacts (Roth & Weißmann, 2022).

Another approach is that an expanded approach to the social ecosystem of skills is a potentially good way to help understand VET better and generate better policies and practices for development (Ramsarup et al., 2023). In addition, it is necessary to pay attention to factors that affect VET, including the ability to integrate young people into the labor market changes in global trends or technology (Carstensen & Ibsen, 2021). Another solution is the need to implement policies that increase youth mobility and successful transitions into VET (Hoffmann & Wicht, 2023). After policies are in place, it is also necessary for critical policy analysis to facilitate discussions about work processes, wage labor, and its intensity (Avis, 2018).

Implications

The systematic literature review of inequality in VET shows a description of inequality in VET activities, and the factors related to inequality in VET. The results of the current analysis of inequality in VET clearly show that inequalities exist, including inequalities experienced by marginalized international students, immigrants, refugees, people with disabilities, gender, labor markets and opportunities, and wages.

The SLR implies that many VET articles have discussed inequalities in the last ten years; knowing inequality in VET, especially marginalized international students, immigrants, refugees, people with disabilities, gender, labor markets and opportunities, and wages, find out the impact of inequality in VET on the education sector. Based on this research result, stakeholders should be made to reduce inequalities by reviewing policies, improving curricula and learning processes, and evaluating learning in VET. This article presents a substantial starting point and research agenda for further studies on VET.

Limitations

In general, this literature review has followed the procedure, but there is still a possibility that relevant studies are not included in this research. This is because only studies published in the period 2014-2023 and from Scopus, ERIC, ScienceDirect, and Semantic Scholars indexed journals were used. In addition, only studies in English were used. The topic of inequality in VET is a broad one, so more relevant studies are needed. Therefore, there may be non-English literature that could be used. In addition, the use of broader studies, not only from Scopus,

ERIC, ScienceDirect, and Semantic Scholars indexed journals, will provide a more in-depth study. In addition, based on the results of the analysis, there is a limitation in that the number of studies screened during the literature review did not provide appropriate and sufficient information. Despite these limitations, this research successfully combined and analyzed relevant studies on inequality in VET.

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Appendix

Table 2: Overview of the Included Studies

No	Aim of the Study	Method	Sample	Countries Involved	References
	Theoretical-literature review				
1	Identify problems in curriculum theory, especially in the context of vocational education and training, and demonstrate the importance of theoretical knowledge for VET students in actively participating in society and their field of work.	Theoretical			(Wheelahan, 2015)
2	The problem of vertical stratification in the German vocational education and training (VET) system examines the relationship between educational attainment and social origin in the German VET system.	Theoretical approach		Germany	(Protsch & Solga, 2016)
3	address these issues through literature that contributes to a new understanding of this vision.	Literature review		Africa	(McGrath, Ramsarup, et al., 2020)
4	developing appropriate theories and policies for vocational education in today's world, which is not only an urgent task in academic terms but also an important basis for transforming vocational education to contribute to social transformation that supports human success in economic, environmental, and social spheres. This research does not intend to claim that "skills can save us" but that vocational education can support broader societal efforts to create a just transition.	Literature			(McGrath, Powell, et al., 2020)
5	to find the best ways to develop expertise that can support sustainable development with the well-being of individuals, society,	Description			(McGrath & Powell, 2016)

No	Aim of the Study	Method	Sample	Countries Involved	References
	and the planet in mind. Also, this research aims to promote social justice, reduce poverty, and achieve better transformation in society and the world of work.				
6	analyzed the Swedish VET education policy established in 2009 and identified the definition of knowledge that is considered legitimate for a high-level VET curriculum.	Analysis of policy and instructional documents			(Köpsén, 2020)
7	It seeks to fill an unfilled space in existing research and offers a new approach to solving this problem. The goal is to challenge the dominant position of large corporations in South Korea's political economy and address the uneven division of the labor market so that VET policy reform can be a more successful and meaningful endeavor.	Documentary analysis using official reports, policy papers, and press releases	22 key stakeholders, including representatives from employers' associations and public organizations	South Korea	(Fleckenstein et al., 2023)
8	shows that dual vocational education graduates have better protection against unemployment and a lower probability of working in temporary employment. However, the earnings of dual vocational education graduates are much lower than those of higher education graduates. The research also highlights some of the future challenges and opportunities faced by the dual vocational education system.	Theory description		Germany	(Ebner, 2015)
9	provide a better understanding of institutional change in VET and how political struggles influence the institutional reforms that take place.	Theoretical review		Denmark	(Carstensen & Ibsen, 2021)
10	explores the relationship between social media use and individual social well-being.	Literature review		Australia	(Cameron et al., 2017)
11	investigates the relationship between vocational education and training (VET), the labor market, and social justice in the current context. The approach used in this research is critical policy analysis, which places the discussion within a broader socio-economic	Critical policy analysis		UK, England	(Avis, 2018)

No	Aim of the Study	Method	Sample	Countries Involved	References
	and political context.				
12	analyze and compare the curricular strategies of these two PPDPs to revamp TVET for the inclusion of disadvantaged learners	document analysis, interviews, and focus groups	two local PPDP-based departments at TVET institutions in Ethiopia and Zambia	Ethiopia and Zambia	(Melesse et al., 2022)
13	reveals gaping holes between the dreams of superior vocational education and training that educational tracking ought to deliver and the realities of lost opportunities and facilitated inequalities, especially in students with poor socio-economic backgrounds, weak social capital, and sparse social networks.	synthesis of the existing literature	between industrialized countries, the tracking is applied at ages of 15 or 16 in most Organisation for Economic Cooperation and Development (OECD) countries	between industrialized countries, the tracking is applied at ages of 15 or 16 in most Organisation for Economic Cooperation and Development (OECD) countries	(Ozer & Perc, 2020)
14	To ensure more equity among diverse student bodies, inclusive education has become a human right and a global norm	Sociological research	vocational training and higher education in Germany's selective	Germany	(Powell & Blanck, 2023)
	Empirical				
15	to fill the under-researched gap in course-related work experience for international students and provide a better understanding of the factors that influence their access to and experience of integrated learning with work experience.	Fieldwork and interview	155 interviews with international staff and students and field research in the Australian vocational education and training sector.	Australia	(Tran & Soejatminah, 2017)
16	This study investigates the influence of ethnic choice at the end of compulsory schooling in Switzerland, a country with a strong vocational education sector that offers competitive incentives, especially for low- or medium-achieving students.	PISA Survey, Logistic regression analysis	Representatives of ninth graders and 15-year-olds in various grades	Swiss	(Tjaden & Scharenberg, 2017)
17	to provide a better understanding of the factors affecting migrant students' participation in VET, as well as their research and policy implications.	Survey	German ninth-grade students	Germany	(Tjaden, 2017)
18	explain the relationship between the division of education and the distribution of knowledge described and represented by teachers. In addition, this research also aims to identify the mechanisms explaining this relationship that are recognized in the discourse and experiences of	In depth-interview	72 principals, coordination teams, and tutors in eight schools	Barcelona	(Tarabini & Jacovkis, 2022)

No	Aim of the Study	Method	Sample	Countries Involved	References
	the actors within the school.				
19	examines the effect of school tracking on vocational education in Turkey over the past decade.	linier regression model	grade 12 students between 2010 and 2019	Turkey	(Suna & Özer, 2021)
20	understand the compromises made by students entering vocational education and training (VET) to achieve their occupational aspirations. This research also seeks to determine how these compromises differ based on social background.	National Educational Panel Study (NEPS) interview	VET students from lower secondary and upper secondary school tracks from the German National Educational Panel Study (NEPS-SC4)	Germany	(Schels et al., 2022)
21	investigates how parental relationships with native and migrant contacts in the German labor market affect children's likelihood of obtaining enterprise-based vocational education (VET) after secondary education. In addition, this study evaluates to what extent parental social network characteristics explain ethnic inequalities in the transition from school to work.	Using longitudinal data from Starting Cohort 4 (ninth graders) of the National Educational Panel Study	Ninth graders	Germany	(Roth & Weißmann, 2022)
22	envisioning new futures in VET and addressing the challenges of equitable transition in the global south by considering the development of VET systems that involve boundary crossings between formal and informal VET systems and developing the concept of social skills ecosystems ontologically through critical realism.	A mix of approaches, including face-to-face and online interviews and focus groups (with learners and staff in vocational institutions, employers in the formal and informal sectors, civil society actors, and youth); participatory action research with community groups and VET college staff; analysis of social media interactions in learning networks; surveys of vocational lecturers; analysis of policy texts (including industrial strategies, spatial strategies, sectoral policies, and skills policies); and critical reflection	learners and staff in vocational institutions, employers in the formal and informal sectors, civil society actors, and youth, community groups and staff of VET colleges; vocational lecturers	Uganda, South Africa, and England	(Ramsarup et al., 2023)

No	Aim of the Study	Method	Sample	Countries Involved	References
		by key team members on their previous work as policy actors and practitioners (including as ministerial advisors and advisors to international development agencies).			
23	to provide a better understanding of VET accessibility for individuals with disabilities and its implications for educational inequality.	multinomial logistic regression model	aged between 20 and 64 in 2014, a range intended to cover the period where most individuals have completed compulsory education and have not retired. In addition, 226 people with unidentified disabilities were excluded, as well as 24 people with missing disability information on some indicators.	Canada	(Pullman, 2019)
24	identifying the factors that influence individuals' decisions to pursue higher education in both vocational and academic education in Switzerland. This study aims to understand individuals' motivations for continuing their education, as well as to examine the influence of work environment factors on this decision.	Multinomial logistic regressions were run to test the hypothesis.	601 working individuals who were not engaged in higher education in 2014	Switzerland	(Nägele et al., 2018)
25	explains the relationship between spatial characteristics and young refugees' VET opportunities. It is hoped that the results can be used to reform current vocational education and training distribution policies, thereby increasing the chances of social and professional integration for young refugees in Germany.	analyzing the IAB-BAMF-SOEP Refugee Survey (n=5216) using multilevel discrete-time event history analysis	of young refugees aged 18-30 to VET, depending on where they live	Germany	(Meyer & Winkler, 2023)
26	investigating the perceptions of young women during their vocational education and training (VET) in traditionally male-dominated STEM (science, technology, engineering, and mathematics) fields	Semi-structured interviews, qualitative methods	Young women (N = 71) who have chosen a career in STEM and are enrolled in a VET program at a secondary school in Switzerland	Switzerland	(Makarova et al., 2016)
27	show how often spatial	Survey	recent longitudinal	Germany	(Hoffmann &

No	Aim of the Study	Method	Sample	Countries Involved	References
	mobility occurs among students entering the VET system, identify factors that influence their spatial mobility, and emphasize the importance of spatial mobility in addressing regional disparities and regional mismatches in the VET market to improve youth access to vocational education and training.		data from NEPS covering a cohort of school leavers from 2011-2017 (N = 5537, 47% female, mean age 18 [SD 1.3]), combined with small-scale geospatial data. A representative sample of 14,540 9th-grade students in German secondary schools.		(Wicht, 2023)
28	describe the role and impact of vocational education (VET) in the marginalized Palestinian context on human well-being and development, looking at the contribution of VET to human well-being and development in this difficult context.	Survey	764 TVET graduates	Palestine	(Hilal, 2017)
29	looked at the relationship between citizenship attitudes, such as those relating to political self-efficacy and collective (school) efficacy, and future choices among students from two vocational secondary schools in the U.K. and Singapore.	Questionnaires and interview	100 questionnaires were completed for each school, interviews with 7 students and 2 teachers at a P.T. college in the U.K. and 12 students and 2 teachers at a Technical College ⁴ in Singapore.	Singapore and England	(Han et al., 2014)
30	addresses inequalities in the short- and medium-term career outcomes of workers with different vocational education and training (VET) programs during their early careers. Researchers investigate how the degree of vocational specificity of VET programs affects occupational status mobility throughout an individual's early career, a topic that has previously received little attention.	multinomial logistic regression model	uses the first cohort of the Transitions from Education to Employment (TREE) panel study on a Swiss cohort who had completed compulsory education in 2000, then aged 15-16. The data consists of nine waves of research conducted between 2001 and 2014.	Swiss	(Grønning & Kriesi, 2022)
31	identify the relationship between regional opportunity structures and students' decisions in choosing education programs.	Multinomial logistic regression model, survey, interview	A stratified random sample of classes of 8th graders in the 2011/12 school year in German-speaking regions of Switzerland (for details, see (Glaser 2015), 125-132). The timing of the survey was midway through grade 8 (January/February	Swiss	(Glaser & Becker, 2016)

No	Aim of the Study	Method	Sample	Countries Involved	References
			2012) as well as at the beginning (September/October 2012) and end (May/June 2013) of the final year of compulsory education.		
32	reveals diversity in differential wage returns among graduates of the German vocational education and training (VET) system.	Hierarchical multilevel analysis	The survey covered around 20,000 core German workers who are at least 15 years old and work at least 10 hours per week.	Germany	(Friedrich & Hirtz, 2021a)
33	explore how early work experiences in their education programs influence young British men and women for future employment, and discover key differences in valued learning content, socialization, and credentialization across each type of work-based learning.	Semi-structured qualitative interviews.	students who have experienced work-based learning, and their teachers	England	(Esmond & Atkins, 2020)
34	identify the problem of exit rates in vocational education and training among disadvantaged students and recommend actions that can be taken to improve this situation.	the marginal mean effect of the multinomial logistic regression model	public registry with a sample size of 10,535 people.	Norway	(Dæhlen, 2017)
35	explores how VET policies affect racial equality and how racial structures in Europe affect VET.	Focus group discussion	Methodologists in the field of refugee education were invited to participate in focus groups, Seven participants in these discussions were not refugees themselves, but rather they worked for refugee charities or had conducted research on refugees and education in an academic context.	European (five European countries, namely Germany, Italy, Romania, the U.K., and Denmark).	(Chadderton & Edmonds, 2015)
36	studies the effects of ethnic choice on the German education system, particularly on young people with an immigrant background.	Survey	longitudinal data from the German National Education Panel Study (NEPS) to explore the effects of ethnic choice at different stages of the education system. n = 11,536 young adults born between 1990 and 1997.	Germany	(Busse & Scharenberg, 2022)
37	migration-related inequalities in youth education pathways at the end of junior secondary	NEPS multicohort sequence design, bivariate analysis	longitudinal data obtained from the German National Education Panel	Germany	(Busse et al., 2023b)

No	Aim of the Study	Method	Sample	Countries Involved	References
	education.		Study (NEPS, Starting Cohort 4).		
38	test hypotheses regarding the role of VET as a socio-economic safeguard and diversifier, as well as provide a better understanding of the long-term effects of educational pathway choice on labor market outcome gaps.	Regression model	15 cohorts of students attending grade 9 of lower secondary education in the period 1978-1992, which included cohorts born between 1962-1976. We restricted the sample to individuals who were alive and living in Denmark at age 40 (N=1,028,365). We also excluded individuals with missing educational or family background information and individuals attending school cohorts with fewer than 20 students (approximately 5% of the total). The final analytic sample consisted of 973,829 individuals, of which about two-thirds (664,642) had siblings who were also born within the study window.	Denmark	(Birkelund & van Werfhorst, 2022)
39	examines the prevalence of Informal Vocational Training (IVT) in India and explores the gap that exists at the accreditation level between IVT and other formal vocational, technical, and professional courses, as well as its impact on people's lives occupationally, economically, socially, and culturally.	The survey method and the case method are methodologically triangulated.	People who are part of the "labor force", and the study includes women who primarily take care of the family but are willing to join paid work if the opportunity arises.	India	(Bazaz & Akram, 2022)
40	seeks to further develop that account through an even stronger emphasis on VET in the context of extreme poverty, inequality, and marginalization as faced in Palestine	Survey	a representative sample of 2,011 graduates from 31 VET institutes constituting the main governmental and nongovernmental VET providers	Palestine	(Hilal et al., 2016)
41	investigated regional and gender differences in academic achievement in Ethiopia and examined whether these differences can be explained in terms of unequal educational opportunities (E.O.)	Multilevel analysis	the 2014 and 2015 national standardized exams for grade 12 students (n = 194503 and n = 205719).	Ethiopia	(Tesema & Braeken, 2018)

No	Aim of the Study	Method	Sample	Countries Involved	References
42	trends in the gender gap of educational achievement and late-life cognition across countries	Survey	use data from the Health and Retirement Study (HRS) in the United States and its sister studies around the world	United States	(Angrisani et al., 2020)
43	investigate online training and educational inequality in TVET (Technical and Vocational Education and Training) delivery in Kenya during the COVID-19	Qualitative case study	15 Technical Training Institutes	Kenya	(Achuodho & Pikó, 2024)
44	asks what form these compromises take by examining multiple extrinsic occupational dimensions and investigating differences by social background	Cluster analysis	lower and intermediate school tracks from the German National Educational Panel Study (NEPS-SC4) are combined with occupation-specific data	Germany	(Schels et al., 2022)
45	investigate the effects of the number of apprenticeships and the presence of school-based VET and a transition system in Germany's federal states on the amount of ethnic inequality in VET for 1. generation migrants	Fuzzy Set Qualitative Comparative Analysis	Data from the official representative survey of the population and the labor market in which one percent of all households in Germany are surveyed annually.	Germany	(Schuller, 2018)
46	generating knowledge about Vocational Educational Training (VET) levels 1 and 2, focusing on their students and the conditions that facilitate or hinder their educational itineraries, and providing proposals aimed at reducing dropout at these levels.	longitudinal methodological	VET in the region of Valencia (41 centres and 71 classrooms.)	Valencia	(López* et al., 2018)