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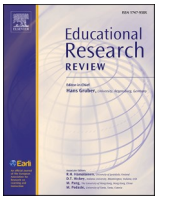

Dropout from initial vocational training – A meta-synthesis of reasons from the apprentice's point of view

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A B S T R A C T

Internationally, vocational education and training (VET) faces some major challenges, one of them certainly constituting the number of premature terminations of contract. A large part of former research within this context has concentrated on the identification and analysis of dropout reasons from the apprentice's point of view. Due to differing foci within previous studies, gaining a comprehensive overview of reasons for premature termination of contract has been impeded. Hence, it was the aim of this paper to summarize central cross-study and cross-sector findings within this context. Therefore, the present state of research was systematically reviewed and meta-synthesized: 70 studies were extracted, including 666 potential dropout variables that were aggregated based on 68 categories. As a result, a collection of empirically retrieved factors was developed and integrated within a framework model of premature termination of contract. Results indicate that former research has mainly focused on dropout drivers within the individual. Simultaneously, there has been far less focus on the learning environment in the workplaces. In addition, only for a small number of dropout categories are the findings consistent. Results of quantitative studies indicate that the dropout probability increases with a low training wage, a training occupation not representing the apprentice's dream job, an apprentice's low educational level, a poor performance level within training, a learning disability, increasing age and a migration background. Finally, studies find significant differences concerning the respective training occupation.

1. Introduction

Vocational education and training (VET) faces major challenges. One of these is undoubtedly the relatively high dropout rate from many VET programs (Le Mouillour, 2017; OECD, 2010),[1] and this despite the high priority being given to VET in education and economic policies worldwide. The reasons for this high dropout rate are multiple. For instance, research has shown that industries and training companies, and indeed the training schemes themselves, differ greatly with regard to training conditions, lowering the attractiveness of several vocational paths (e.g. Negrini et al., 2015; Negrini et al., 2016). At the same time, a global increase in academicization offers apprentices viable, attractive, alternative options, leading to increasing dropout rates in many countries worldwide (e.g. CEDEFOP, 2016; Dornmayr & Nowak, 2012; Schmid et al., 2014). The increasing importance being placed on this topic is visible in the numerous investigations undertaken in Europe (e.g. Van Houtte & Demanet, 2015 – Belgium, Dornmayr & Löffler, 2018 – Austria, Andersen & Helms, 2019 – Denmark, Center Inffo, 2019 – France, Smulders et al., 2019 – the Netherlands, DGERT, 2019 – Portual, Skolverket ReferNet Sweden, 2019 – Sweden) and on other continents (e.g. NCVER, 2020 – Australia, Kis & Field, 2009 – Chile, Yi et al., 2015 – China).

Dropout is associated with multiple consequences from various perspectives. It can be problematic at the company level if affected

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[1] The nationally reported dropout rates vary greatly within OECD VET countries (e.g. 18.7% for China versus 58.6% for Australia) and are barely comparable due to different national definitions and reporting standards.

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companies were to withdraw from offering training programs in the future as a reaction to high dropout numbers (e.g. Deuer, 2003; Stalder & Schmid, 2006). From a societal point of view, dropouts in the VET system often result in a shortage of qualified personnel, in unemployment, and in people taking up jobs in the low-wage sector (e.g. Deuer, 2003; Kriesi et al., 2016). In the worst cases, it also causes high costs on both the aggregated and the individual level (e.g. Bessey & Backes-Gellner, 2015; Hensen, 2014). At the individual level, from an apprentice's point of view, dropping out can be a successful strategy to adjust for a wrong career choice by choosing a more fitting educational program (e.g. Uhly, 2015). In other cases, though, it causes a feeling of failure, increases both the risk of demotivation and the need to re-orient one's initial vocational goals, and is associated with a feeling of having lost time (e.g. Klaus, 2014; Stalder & Schmid, 2006; Stamm, 2012). Regardless of the path an apprentice follows, dropping out represents a disruption of the vocational biography (e.g. Deuer, 2003; Stalder & Schmid, 2006).

The majority of studies on this issue focus retrospectively on identifying the central reasons for premature contract termination in VET and concentrate mainly on the apprentice perspective. In the studies, the researchers have generally performed multi-causal analyses, as it is indisputable that, in most cases, a variety of dropout reasons apply (e.g. Wolf, 2016). However, the different foci of the various studies make it difficult to provide a comprehensive and structured overview of the reasons for premature contract termination in VET.

Given this context, this paper aims to identify central cross-study and cross-sector findings on dropouts in VET by systematically reviewing and meta-synthesizing the present state of research. We focus on studies that have either qualitatively or quantitatively identified dropout causes and use the findings from those studies to generate an overview of dropout reasons. We, thus, (1) identify the reasons for dropout found in qualitative research, (2) identify the reasons that were found in quantitative research, (3) aggregate the variables analyzed within the former and the latter, (4) integrate all reasons into a framework model of premature termination of contract, and (5) draw coherent conclusions regarding the present state of research.

In this analysis, the focus is on the apprentice's perspective only for two reasons. First, most examined studies focus on the apprentice point of view. Given the lack of studies from an organizational perspective (employer), an aggregated integration of dropout reasons from that (employer) perspective is hardly feasible. Second, the present state of research indicates that most dropouts are initiated by the apprentice (e.g. Piening et al., 2010). Hence, an aggregated overview for this group seems both feasible and of particular importance.

2. Operationalizing dropout decisions

Former research reflects different understandings of the term dropout, especially in different countries. In this paper, dropout is

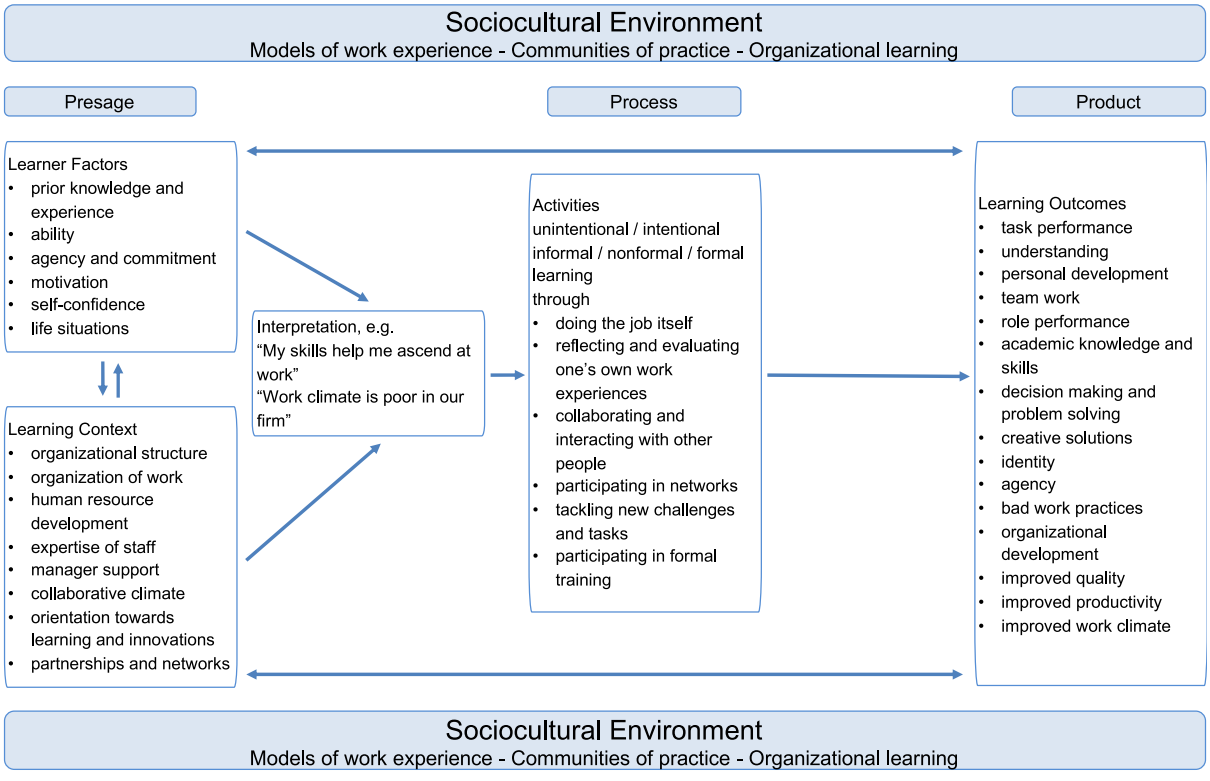


Fig. 1. 3-P model of workplace learning (adapted from Tynjälä, 2013; modified from Biggs, 1999).

defined (following the Author group of the German national education report, 2010, XI) as the decision to leave initial VET before achieving a formal qualification; this decision is usually marked by premature termination of contract. This definition has two implications. First, it excludes all apprentices who only intend to drop out (e.g. Gow et al., 2008). Second, dropout, as we define it, is independent of an apprentice's subsequent vocational choice. Some studies distinguish between apprentices who have dropped out on the basis of whether they re-entered the training market – for instance, whether they found another training company or another training occupation – or whether they found another alternative, for example, decided to go to school or university full-time, to start military service, or to find a job that did not require a formal qualification (e.g. Barocci, 1972; Karmel & Mlotkowski, 2010; Molgat et al., 2011). However, most data sources do not enable researchers to differentiate these groups as an apprentice's career pathway subsequent to dropout is not usually recorded.

On the topic of an apprentice's decision to prematurely terminate a contract, research has secured considerable knowledge about (1) the timing, (2) the size of affected companies, and (3) the decision-making process itself. First, the majority of apprentices who terminate prematurely do so within the first year of training, and especially during the probationary period (e.g. Cully & Curtain, 2001). Second, those companies most affected by premature termination of contract are small-sized, in particular companies with fewer than 50 employees (e.g. Piening et al., 2012). Third, dropout is often the result of a decision-making process rather than a sudden irrational act (e.g. Hensge, 1988; Jonker, 2006; Lamamra & Masdonati, 2008). In addition, dropout is generally caused by a conglomerate of reasons: apprentices generally confirm that a mixture of different factors influenced their decision-making (e.g. Ernst & Spevacek, 2012; Greilinger, 2013). Therefore, reasons for premature termination of contract should be categorized and systemized within a dynamic framework model.

We use Tynjälä's (2013) three pillar (3-P) approach, a modification of Biggs' (1999) distinction between presage, process, and product factors within a workplace learning context (Fig. 1).

The core model consists of the 3 Ps. The presage dimension comprises learner factors and the learning context. The former strongly emphasizes preconditions, motives, and learner engagement while the latter focuses on the occupational prerequisites of the training provider i.e. the company. The process dimension describes the nature of learning processes in the workplace, which includes the characteristics of work activities, e.g. interaction and collaboration with others. The product dimension reflects possible learning outcomes, focused on an individual's personal and professional development (Tynjälä, 2013). The dimension includes premature termination of contract as it is one possible – although generally undesired – learning outcome.

In comparison to Biggs' approach, Tynjälä's strongly emphasizes the subjective perception of objective environmental impacts and the development of dispositions and behaviors of an individual in training ('interpretation'). Consequently, both the perception and the cognitive and emotional processing of a situation contribute decisively to an individual's social conditioning. However, the perception and use of learning opportunities within occupational surroundings are highly individual matters and may differ (Tynjälä, 2013). Premature termination of contract, thus, reflects the result of an individual's decision-making process, and the individual perspective must be considered. Any aggregated results are then only valid for that group of apprentices. Hence, we propose understanding premature termination of contract as a decision-making process by an apprentice who perceives one or several mismatches within vocational training, giving rise to the decision that dropout is the only way out. The following analysis collates the results from research on dropout in VET and uses them to identify these mismatches. More precisely, we systematically review and analyse studies by screening, categorizing, and systemizing these reasons within a dynamic framework model (Fig. 2), adapted from the 3-P model by Tynjälä (2013).

In our framework model, we combine the 3-P approach with a systemic view of VET at the input level. VET refers to various forms of vocational learning in different national contexts. Nevertheless, globally, almost all VET systems aim to develop occupational competence and are characterized by a combination of workplace learning (at a practical site) and work-based learning (usually administered at vocational schools). Depending on the national system, the proportion of practical training at the workplace versus work-based training at a vocational school varies. Moreover – internationally and nationally – VET programs differ with respect to many other aspects (e.g. training duration and target group and outcomes such as competences, transition to higher levels of education, etc.; Kuczera, 2007). This variety of VET practices makes comparing different VET systems challenging, and global recommendations can only claim limited prevalence. However, this contribution does not aim to compare dropout behaviour internationally. Instead, it aims to collect possible reasons for dropout in diverse systems and order them with regard to two aspects, each with two input blocks: 1) the two learning sites commonly prevalent in all VET systems: workplace and vocational school (Fig. 2, company and school factors) and 2) the occupational and individual categories that form the basic components of any VET (Fig. 2, professional and learner factors). On this basis, we seek to reveal past research foci as well as research gaps.

3. Analysis

To summarize the existing findings, a meta-analysis, the analysis of analyses (e.g. Glass et al., 1981), seems not merely useful but indeed necessary. However, a classic quantitative meta-analysis is impossible for this review since each of the numerous studies on the topic presents a particular and different collection of dropout reasons, uses non-compliant conceptualizations and operationalizations of dropout reasons, and employs heterogeneous analyses. Thus, a meta-synthesis (sometimes referred to as qualitative meta-analysis) is used here. It can fully and systematically integrate existing research results, with the aim of generating an integrative overview (e.g. Jensen & Allen, 1996; Lipsey & Wilson, 2001; Paterson, 2012). In the present case, the dataset to be aggregated is qualitative, consisting of those variables that former studies have identified as possible reasons for premature termination of contract.

The approach used in this study is based on a systematic review and meta-synthesis of findings of the aggregated relevant qualitative and quantitative studies. This type of analysis can be understood as a method using systematic and explicit methods to identify,

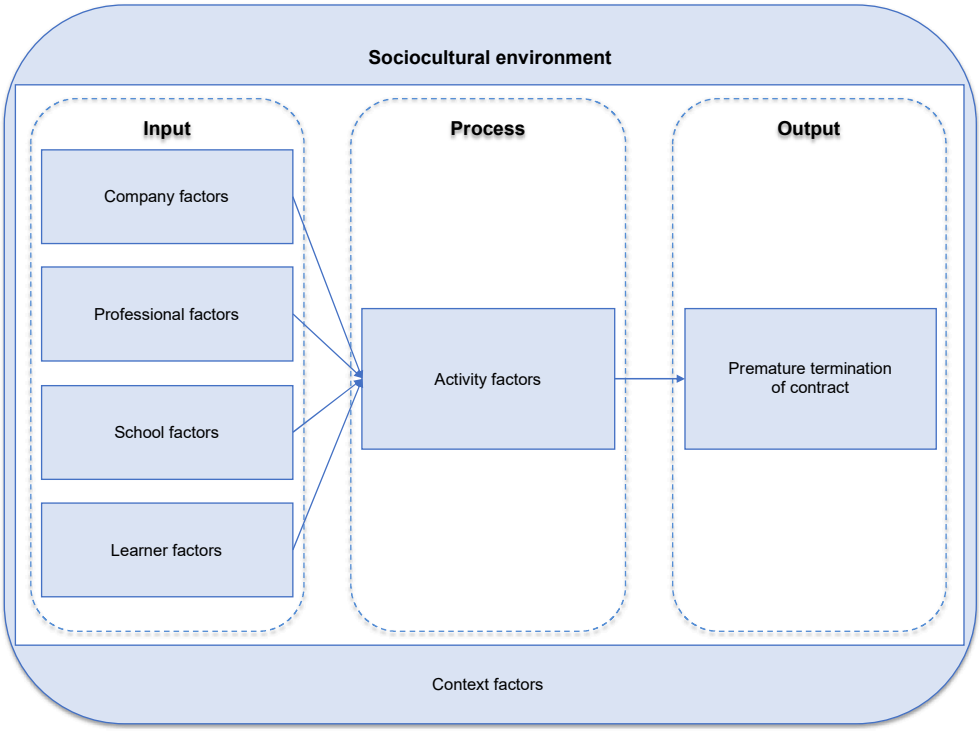


Fig. 2. 3-P model: Reasons for premature termination of VET contracts (modified from Tynjälä, 2013).

select, merge, and critically appraise relevant research united by a specific research question. More precisely, data from studies is collected and analyzed so that it can be included within an aggregation of findings, in an approach derived from Cooper's (1982) five-tier scheme. The five steps of systematically reviewing and meta-synthesizing former research included (1) literature search (Section 3.1), (2) literature selection (Section 3.2), and (3) extraction of variables. Furthermore, (4) inductively determining dropout categories comprised the core of this qualitative meta-synthesis. As a last step, (5) all categories were organized within an integrative dropout model (Section 3.3), forming the basis for the results, discussed in Section 3.4.

3.1. Literature search

We searched eight databases[2] using a combination of seventeen English and German search terms.[3] Thereby, we identified 49,794 records, reduced to 37,422 records after removing duplicates. There was no limitation on time, country, or publication type. The result of this initial review showed that, especially since 2010, the number of publications on premature contract termination in the VET context has increased considerably. An initial check of the literature search revealed the following thematic foci:

- Some studies were concerned with the challenge of estimating the exact dropout rate, focusing on how to correctly calculate it (e.g. NCVER, 2016; Uhly, 2014).
- Some studies aimed to identify an apprentice's tendency to prematurely terminate a contract, with a view to early prevention. They included the search for and the evaluation of prevention strategies (e.g. Tippelt, 2011; Zepp et al., 2014). For instance, some authors try to develop measures to improve the applicant selection process or address identifying indicators suggestive of terminating training (e.g. Forsblom et al., 2014; Johnson, 1967; Siegenthaler, 2011). In addition, both school-based (e.g. Jäppinen, 2010) and institution-based (e.g. wage subsidies; Fries et al., 2013) prevention strategies were discussed. Also, some studies described prevention strategies within the career choice process, prior to commencing training (e.g. internships or other forms of work experience; Karmel & Oliver, 2011).
- A small number of studies focused on the destinations of those apprentices who had decided to prematurely terminate their contract (e.g. Ernst & Spevacek, 2012). This issue is also relevant for questions concerning multiple dropouts and re-entry into the training market (e.g. Laiminger, 2015; Schmid et al., 2016).

[2] Business Source Premier, Deutscher Bildungsserver, EconLit, Education Resources Information Center (ERIC), Fachportal Pädagogik, Literaturdatenbank berufliche Bildung (LDBB), Social Sciences Citation Index (SSCI), Taylor & Francis.

[3] abandon*, discontin*, dissolut*, drop out combined with apprentice*, training, VET, vocational education, vocational school, *ausbildung, Ausbildungsabbruch, Berufsschule, Lehrvertragslösung combined with Abbruch, Vertragslösung, Vertragsauflösung, vollzeitschul*.

Table 1
Literature search results.

Year	ID	Author(s)	Study	Country	Method
1967	01	Johnson, 1968	Some dimensions of the drop-out problem in apprenticeship training	Canada	quantitative
1968	02	Johnson, 1968	A Second Look at the Drop-Out Problem in Apprenticeship Training	Canada	quantitative
1972	03	Barocci, T. A.	The drop-out and the Wisconsin apprenticeship program	USA	quantitative
1983	04	Heierli et al., 1983	Häufigkeit und Art gesundheitlicher Begründungen von Lehrabbrüchen	Switzerland	quantitative
1984	05	Keck, 1984	Bestimmungsfaktoren für den Abbruch der betrieblichen Berufsausbildung. Aus der Untersuchung des IAB "Jugendliche beim Übergang vom Bildungs- in das Beschäftigungssystem"	Germany	quantitative
1988	06	Hensge, K.	Ausbildungsabbruch im Berufsverlauf	Germany	qualitative
1991	07	Kloas, 1991	Der ersatzlose Abbruch einer Ausbildung. Quantitative und qualitative Aspekte	Germany	qualitative
	08	Alex, 1991	Gibt es Anlass, die steigende Zahl der vorzeitig gelösten Ausbildungsverträge mit wachsender Sorge zu betrachten?	Germany	quantitative
1998	09	Neuenschwander and Stalder, 1998	Lehrvertragsauflösungen aus der Sicht von Jugendlichen. Ergebnisse einer Deutschschweizer Studie	Switzerland	quantitative
2001	10	Cully, M., & Curtain, R.	Reasons for New Apprentices' Non-Completions	Australia	quantitative
	11	Westdeutscher Handwerkskammertag, 2001	Befragung von Abbrechern, Ausbildern und Berufskolleglehrern zum Thema Ausbildungsabbruch: Report für die Projektbeiratssitzung.	Germany	quantitative
2003	12	Schöngen, 2003a	Ausbildungsvertrag gelöst = Ausbildungsvertrag abgebrochen?	Germany	quantitative
	13	Schöngen, 2003b	Lösung von Ausbildungsverträgen – schon Ausbildungsabbruch? Ergebnisse einer Befragung des Bundesinstituts für Berufsbildung.	Germany	quantitative
2005	14	Callan, 2005	Why do students leave: Leaving vocational education and training with no recorded achievement	Australia	quantitative
2006	15	Glaesser, J.	Dropping out of further education: a fresh start: Findings from a German longitudinal study	Germany	quantitative
	16	Jonker, E.	School hurts: Refrains of hurt and hopelessness in stories about dropping out at a vocational school for care work	Netherlands	qualitative
	17	Stalder, B. E., & Schmid, E.	Lehrvertragsauflösungen, ihre Ursachen und Konsequenzen. Ergebnisse aus dem Projekt LEVA	Switzerland	quantitative
2008	18	Beicht, U., & Ulrich, J. G.	Ausbildungsverlauf und Übergang in Beschäftigung. Teilnehmer/-innen an schulischer und betrieblicher Ausbildung im Vergleich	Germany	quantitative
	19	Bessey and Backes-Gellner, 2008	Warum Jugendliche eine Ausbildung abbrechen. Analyse von Ausbildungsabbrüchen	Germany	quantitative
	20	Coneus, K. et al.	Noncognitive skills, internet use and educational dropout	Germany	quantitative
	21	DGB, 2008	Ausbildungsreport 2008	Germany	quantitative
	22	Lamamra, N., & Masdonati, J.	Wer eine Lehre abbricht, hat dafür oft mehrere Gründe. Qualitative Studie des EHB.	Switzerland	qualitative
	23	Moser et al., 2008	Lehrvertragsauflösung. Die Situation von ausländischen und Schweizer Lernenden. Ergebnisse aus dem Projekt LEVA	Switzerland	quantitative
2009	24	Coneus, K. et al.	Noncognitive skills, school achievements and educational dropout	Germany	quantitative
	25	DGB, 2009	Ausbildungsreport 2009	Germany	quantitative
2010	26	Beinke, 2010	Befragung zum Übergangsmanagement und zur Abbrecherproblematik - Einleitung und Begründung der Abbrecherstudie	Germany	quantitative
	27	Cart et al., 2010	Apprenticeship contracts: Why they are breached	France	quantitative
	28	DGB, 2010	Ausbildungsreport 2010	Germany	quantitative
	29	Karmel, T., & Mlotkowski, P.	How reasons for not completing apprenticeships and traineeships change with duration	Australia	quantitative
	30	Meeuwisse et al., 2010	Reasons for withdrawal from higher vocational education: A comparison of ethnic minority and majority non-completers	Netherlands	quantitative
	31	Piening, D. et al.	Lösung von Ausbildungsverträgen aus Sicht von Auszubildenden und Betrieben. Eine Studie im Auftrag der Industrie- und Handelskammer Osnabrück-Emsland	Germany	quantitative
2011	32	Beinke, 2011a	Ausbildungsabbruch und eine verfehlte Berufswahl	Germany	quantitative
	33	Beinke, 2011b	Berufswahlschwierigkeiten und Ausbildungsabbruch	Germany	quantitative
	34	Coe, P. J.	Apprenticeship program requirements and apprenticeship completion rates in Canada	Canada	quantitative
	35	DGB, 2011	Ausbildungsreport 2011	Germany	quantitative
	36	Karmel, T., & Oliver, D.	Pre-Apprenticeships and their impact on apprenticeship completion and satisfaction	Australia	quantitative
	37	Laporte, C., & Mueller, R. E.	The completion behaviour of registered apprentices in Canada: Who continues, who quits, and who completes programs?	Canada	quantitative
	38	Molgat, M. et al.	Vocational education in Canada: Do policy directions and youth trajectories always meet?	Canada	qualitative
2012	39	Bhawani, S. A., & Sujan, N.	Determinants of vocational training drop out: A logit model analysis	Nepal	quantitative
	40	Buerke et al., 2012	Auszubildende im Handwerk. Eine empirische Studie in der Region Jena	Germany	quantitative
	41	DGB, 2012	Ausbildungsreport 2012	Germany	quantitative
	42	Ernst, V., & Spevacek, G.	Verbleib von Auszubildenden nach vorzeitiger Vertragslösung	Germany	quantitative
	43	Piening, D. et al.	Hintergründe vorzeitiger Lösungen von Ausbildungsverträgen aus der Sicht von Auszubildenden und Betrieben in der Region Leipzig. Eine Studie im Auftrag der Landratsämter Nordsachsen und Leipzig sowie der Stadt Leipzig	Germany	quantitative

(*continued on next page*)

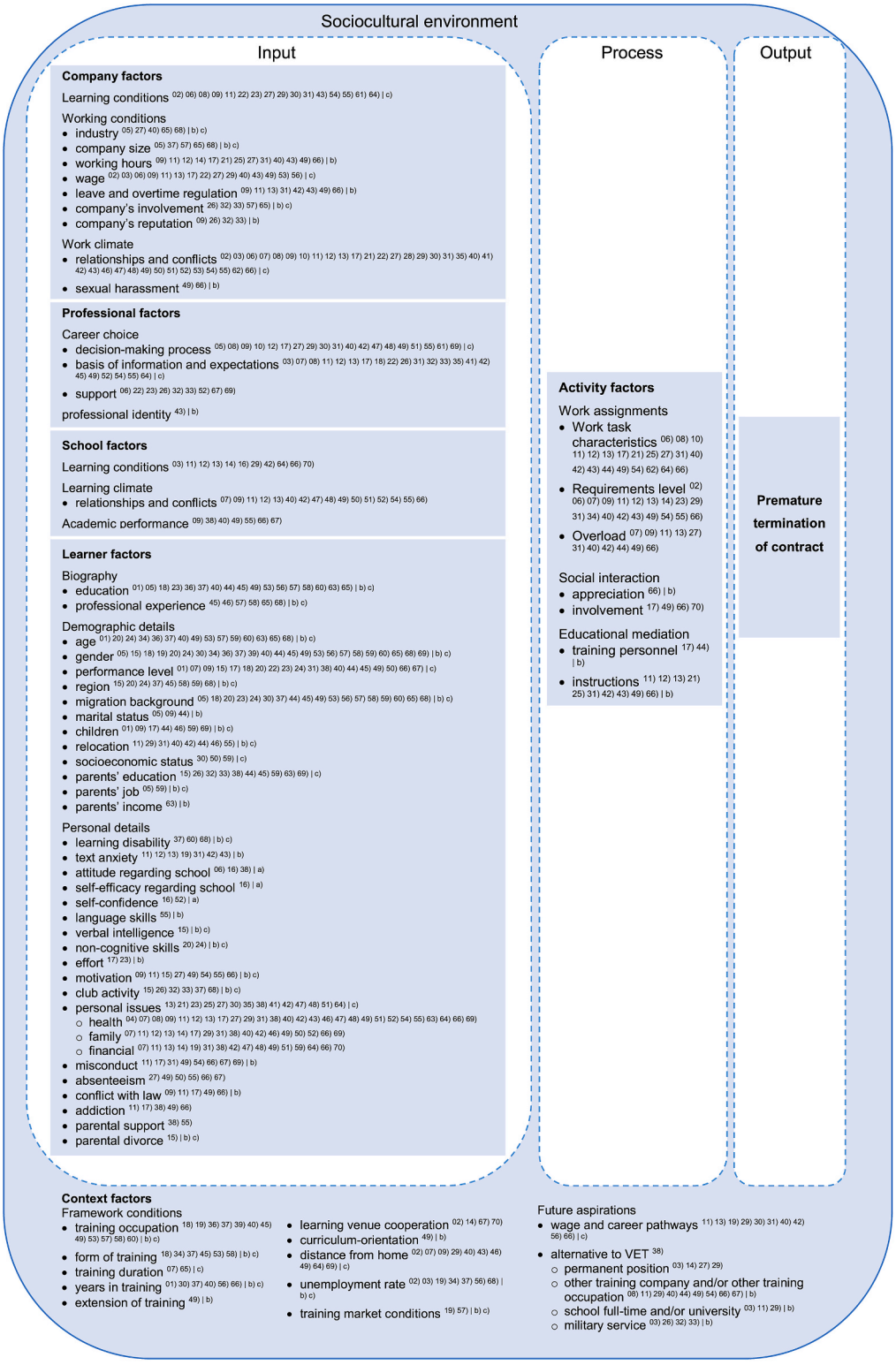
Table 1 (*continued*)

Year	ID	Author(s)	Study	Country	Method
	44	Stalder, 2012	Kritische Transitionen in der beruflichen Grundbildung: Wenn Ausbildungswege nicht der Norm entsprechen	Switzerland	quantitative
2013	45	Beicht, U., & Walden, G.	Duale Berufsausbildung ohne Abschluss - Ursachen und weiterer bildungsbiografischer Verlauf. Analyse auf Basis der BIBB-Übergangsstudie 2011	Germany	quantitative
	46	Cho, Y. et al.	Gender differences in the effects of vocational training: Constraints on women and drop-out behaviour	Malawi	quantitative
	47	DGB, 2013	Ausbildungsreport 2013	Germany	quantitative
	48	DGB NRW, 2013	DGB Ausbildungsreport Nordrhein-Westfalen 2013. Zukunft gemeinsam gestalten	Germany	quantitative
	49	Greilinger, A.	Analyse der Ursachen und Entwicklung von Lösungsansätzen zur Verhinderung von Ausbildungsabbrüchen in Handwerksbetrieben	Germany	quantitative
	50	Tas et al., 2013	Reasons for dropout for vocational high school students	Turkey	qualitative
2014	51	DGB, 2014	Ausbildungsreport 2014	Germany	quantitative
	52	Klaus, S.	Das Scheitern des beruflichen Bildungsprozesses aus der Perspektive der Betroffenen. Ergebnisse einer biographieanalytischen Studie über die vorzeitige Vertragslösung	Germany	qualitative
	53	Kropp et al., 2016	Die vorzeitige Lösung von Ausbildungsverträgen. Eine Beschreibung vorzeitiger Lösungen in Sachsen-Anhalt und eine Auswertung von Bestandsdaten der IHK Halle-Dessau	Germany	quantitative
	54	Mischler, 2014	Abbruch oder Neuorientierung? Vorzeitige Lösung von Ausbildungsverträgen im Handwerk	Germany	quantitative
	55	Schmid, K. et al.	Schul- und Ausbildungsabbrüche in der Sekundarstufe II in Oberösterreich	Austria	quantitative
2015	56	Bessey and Backes-Gellner, 2008	Staying within or leaving the apprenticeship training system? Revisions of educational choices in apprenticeship training	Germany	quantitative
	57	Rohrbach-Schmid, D., & Uhly, A.	Determinanten vorzeitiger Lösungen von Ausbildungsverträgen und berufliche Sefmentierung im dualen System. Eine Mehrebenenanalyse auf Basis der Berufsbildungsstatistik	Germany	quantitative
	58	Uhly, A.	Vorzeitige Vertragslösungen und Ausbildungsverlauf in der dualen Berufsausbildung. Forschungsstand, Datenlage und Analysemöglichkeiten auf Basis der Berufsbildungsstatistik	Germany	quantitative
	59	Yi, H. M. et al.	Exploring the dropout rates and causes of dropout in upper-secondary technical and vocational education and training (TVET) schools in China	China	quantitative
2016	60	Gambin, L., & Hogarth, T.	Factors affecting completion of apprenticeships in England	England	quantitative
	61	Hasler, 2016	Lehrvertragsauflösungen im Schweizer Bauhauptgewerbe. Unausgeschöpftes Potenzial. Ursachen und Massnahmen	Switzerland	quantitative
	62	Heisler, 2016	Qualität der Ausbildung und Professionalität des Ausbildungspersonals: Bedingungsfaktoren für Ausbildungsabbrüche aus der Sicht von Jugendlichen	Germany	qualitative
	63	Hjorth, C. F. et al.	Mental health and school dropout across educational levels and genders: A 4.8 year follow up study	Denmark	quantitative
	64	Kropp et al., 2016	Die vorzeitige Lösung von Ausbildungsverträgen. Ergebnisse einer Befragung von Auszubildenden in Berufsschulen und Arbeitsagenturen.	Germany	quantitative
	65	Mischler, 2014	Die vorzeitige Lösung von Ausbildungsverträgen im Handwerk. Multivariate Analysen auf Basis einer Kammerstatistik	Germany	quantitative
	66	Schuster, 2016	Ursachen und Folgen von Ausbildungsabbrüchen	Germany	quantitative
2019	67	Cseh Papp and Dajnoki, 2019	Dropping out of vocational training – Hungarian experiences	Hungary	quantitative
	68	Greig, M.	Factors affecting Modern Apprenticeship completion in Scotland	Scotland	quantitative
	69	Lestari and Setyadharma, 2019	Factors that Influence Drop Out of Vocational High School	Indonesia	quantitative
	70	Van der Bijl and Lawrence, 2019	Retention and attrition among National Certificate (Vocational) Civil and Construction students in South African TVET	South Africa	qualitative

- Finally, many studies tried to identify reasons for premature termination of contract. Within this field, mostly, apprentices are at the center of interest (e.g. Bessey & Backes-Gellner, 2015; Hönle & Bojack, 2011). Only rarely were other vocational training system actors surveyed – for instance, training experts, training personnel, and vocational teachers, or a combination thereof (e.g. Negrini et al., 2015; Negrini et al., 2016; Wolf, 2016).

3.2. Literature selection

After reviewing and evaluating the search results in the initial check of the 37,422 records, those studies that focused on reasons for premature termination of contract were extracted (records screened: 37,422; records excluded: 36,728). From the remaining 694 studies, all studies were then eliminated (634 studies) that (1) were not written in English or German, (2) were only theoretically or conceptually founded, (3) focused on dropouts but not in the VET context, (4) focused exclusively on special groups of apprentices, such as individuals with a mental or physical impairment, (5) analyzed a point of view other than that of an apprentice – for instance, training personnel's or vocational teachers' points of view (e.g. Negrini et al., 2015; Negrini et al., 2016; Rohrbach-Schmidt & Uhly, 2016), (6) analyzed an apprentice's intention to prematurely terminate the contract (e.g. Gow et al., 2008), hence reflecting a prospective rather than a retrospective approach.



Note
01 – 70 Study ID (Table 1)
a) Dropout category reflected by qualitative approaches only
b) Dropout category reflected by quantitative approaches only
c) Dropout category included in overview of effect sizes (appendix)

(caption on next page)

Fig. 3. Dropout categories analyzed in former research.

On the basis of the literature search and the selection criteria, 60 studies were deemed relevant. An additional 10 studies were added by working through the references in the selected papers to find additional ones. Thus, in all, 70 studies were selected (Table 1). They represent 666 potential dropout variables.

3.3. Former foci and analyzed variables

Table 1 reveals that the majority of studies were conducted in German-speaking countries (Germany: 39, Switzerland: 7, Austria: 1). There were a few more studies from Europe (e.g. The Netherlands, Denmark), Northern America, and Australia. Studies from other countries were rare. Nine studies used a qualitative design, 61 a quantitative design. Within the latter, effect sizes were found in 21 cases; 40 were limited to descriptive results.

Initially, all variables resulting from qualitative research were extracted. Then, those variables that were part of quantitative research were aggregated. This approach to collecting variables is adapted from the steps within Mayring's (2004) qualitative content analysis, which include (1) generalization, (2) selection, and (3) bundling. First, those reasons for premature termination of contract that were identical or similar in content across studies were grouped. This step was independent of specific operationalizations – for instance, a negative or positive wording. Second, those variables that were grouped were given a meaningful label that was extracted within the context of all studies (Jensen & Allen, 1996). Third, on the basis of this translation process, variables were bundled within dropout categories according to the framework model (Fig. 2), differentiating company factors, professional factors, school factors, learner factors, activity factors, and context factors. Fig. 3 provides an overview of the dropout categories with reference to the respective studies. To improve text readability, references are excluded from the following subsections, where we present our findings, but can be found in Fig. 3.

3.3.1. Findings from qualitative studies

3.3.1.1. Company factors. The findings from the qualitative studies reveal three company factors associated with premature termination of contract: 'learning conditions', 'working conditions', and 'work climate'. The first category consists of descriptions of bad or poor conditions in the workplace that were emphasized by those dropping out, for instance a lack of adequate training personnel or insufficient work material. As a 'working condition' that reflects workplace framework conditions, only 'wage' is mentioned in qualitative research. The category 'work climate' contains findings regarding dropouts who attached a high importance to relationships, in relation to conflicts with supervisors, training personnel, or other employees or apprentices. Sometimes, bullying in the workplace was also mentioned. Some results are also linked to references to a bad working atmosphere in the training company in general.

3.3.1.2. Professional factors. The results of the qualitative studies show that apprentices who dropped out often mentioned how their interests had changed during the training period. More precisely, they realized that they had made the wrong career choice, for instance, choosing either the wrong training occupation or the wrong training company. These aspects were transferred to the category 'decision-making process'. Others indicated that they had no or little information in advance regarding their training occupation or that they had different expectations, even though they were aware of not having chosen their dream job. These aspects were grouped within the category 'basis of information and expectations'. Furthermore, the qualitative studies reveal that it seems to be important how the career choice process itself went: whether apprentices received support from their families regarding the chosen training occupation or personal guidance from institutions. Related variables were aggregated within the category 'support'.

3.3.1.3. School factors. Apprentice surveys show that school factors play a relatively subordinate role in reasons for premature termination of contract. Where such causes are mentioned at all, they are related to poor 'learning conditions' and/or to 'relationships and conflicts' with teachers, the school administration, or other actors or – in the worst cases – bullying. Furthermore, an apprentice's bad 'academic performance' – for instance, (multiple) failure in exams – is noted as influencing the decision-making process.

3.3.1.4. Learner factors. The qualitative research elicits numerous learner factors influencing dropout. Several reasons within the personal environment are stated. These can be divided into the following categories: 'performance level', 'socioeconomic status', 'personal issues' in general, such as health issues – including pregnancy –, 'family issues', and 'financial issues'. The following factors can also be distinguished: 'absenteeism', 'addiction', 'parental support', 'parents' education', 'attitude regarding school', 'self-efficacy regarding school', and 'self-confidence'.

3.3.1.5. Activity factors. Work task-related aspects of the training process are also revealed in the qualitative studies. First, basic 'work task characteristics' such as the relevance or complexity of tasks were mentioned by apprentices who dropped out. In particular, the feeling of doing irrelevant or humiliating tasks or of being exploited is related to premature contract termination. Second, the 'requirements level' (referring to high demands) was identified. Third, some apprentices indicated that 'overload' (physical or

psychological) in training caused dropout. Fourth, a lack of 'involvement' was mentioned.

3.3.1.6. Context factors. Qualitative research has determined that context factors for premature termination of contract are related either to the framework conditions of training, such as 'training duration', 'distance from home', 'learning venue cooperation', or to the existence of an 'alternative to training' – for instance, the possibility of finding a job even without a formal qualification.

3.3.2. Findings from quantitative studies

3.3.2.1. Company factors. In the quantitative studies, first, 'learning conditions' in the workplace were reported in relation to premature termination of contract. In addition, working conditions and also the work climate were mentioned. Studies that focus on working conditions report 'industry', 'company size', 'working hours', 'wage', 'leave and overtime regulation' as well as the 'company's involvement' and/or 'investment in training' and the 'company's reputation'. Work climate research differentiates between 'relationships and conflicts' with, for instance, supervisors, colleagues, training personnel, and other apprentices as well as 'sexual harassment'.

3.3.2.2. Professional factors. The quantitative studies that include a focus on professional factors concentrate either on the 'career choice' process, especially regarding the 'decision-making process'; on investigating the 'basis of information and expectations' as related to an apprentice's comparison between expectations and reality; or on 'support'. At least one study includes the variable of 'professional identity', focusing on the question as to whether an apprentice perceives a fit with the training.

3.3.2.3. School factors. In the studies with a quantitative design, at least some school factors are found as reasons for premature termination of contract. Foci of interest are 'learning conditions' or 'relationships and conflicts' with school actors. Furthermore, in five cases, the apprentices' 'academic performance' is extracted as an additional dropout category.

3.3.2.4. Learner factors. In the quantitative studies, numerous variables concentrate on the learner in searching for reasons for premature termination of contract. Some biographical details are analyzed, focusing on 'education' or different types of 'professional experience' prior to apprenticeship, because some apprentices were previously self-employed, in an employment relationship or in another apprenticeship. Furthermore, the majority of the studies reflect on apprentices' demographic factors, such as 'age', 'gender', 'performance level', 'region', 'migration background', or on personal details such as 'language skills', 'non-cognitive skills', family issues, or financial issues (see Fig. 3 for the full list).

3.3.2.5. Activity factors. Some quantitative research analyzes the relation between work tasks and premature termination of contract. The focus lies on five factors: basic 'work task characteristics', such as the complexity and relevance of tasks; the 'requirements level'; an apprentice's feeling of 'overload'; factors of social interaction in the workplace, such as 'appreciation' and 'involvement'; and aspects of educational mediation, related to 'training personnel' and to 'instructions'.

3.3.2.6. Context factors. Several context factors of premature termination of contract are mentioned in the quantitative research. They relate either to the framework conditions of training or to future aspirations. Dropout categories connected to the former are 'training occupation', 'form of training', 'training duration', 'years in training' (respective to the timing of dropout), 'extension of training', 'learning venue cooperation', 'curriculum-orientation', 'unemployment rate', 'distance from home', or 'training market conditions' (dependent on the supply-demand ratio). Future aspirations include general aspects of prospects for 'wage and career pathways' or reveal whether a learner has found an 'alternative to VET' – for instance, the apprentice decided to start a new job that does not require a qualification or found another training company (and/or another training occupation), or decided to enroll in school full-time or to go to university or enlist in military service.

Table 2
Aggregated overview of dropout factors analyzed within former research.

Dropout factor	Total number of studies	Qualitative approach	Quantitative approach	Total number of categories	Qualitative approach	Quantitative approach
Company factors	48 (69%)	7 (78%)	41 (67%)	10 (15%)	3	10
Professional factors	39 (56%)	4 (44%)	35 (57%)	4 (6%)	3	4
School factors	24 (34%)	6 (67%)	18 (30%)	3 (4%)	3	3
Learner factors	64 (91%)	8 (89%)	56 (92%)	32 (47%)	11	29
Activity factors	28 (40%)	4 (44%)	24 (39%)	7 (10%)	4	7
Context factors	43 (61%)	3 (33%)	40 (66%)	12 (18%)	3	12
Total	**70**	**9**	**61**	**68**	**27**	**65**

4. Discussion

Aggregating findings from qualitative and quantitative research can be supported by recourse to the adaption of the 3-P model (Fig. 2). Fig. 3 contains all categories related to premature termination of contract, as analyzed from the reviewed studies. It differentiates between those that were found only in qualitative or in quantitative approaches. The aggregation of results (Table 2) shows that studies reveal and analyse numerous reasons for dropout.

The second column of Table 2 reveals that learner factors are recorded in almost all studies, followed by company, context, and professional factors (all in more than half of the studies). There is less focus on activity factors and even less focus on school factors. This impression is reinforced by the results in column 4, with results from the majority of studies that used a quantitative design. Column 5 of the table shows that there are 68 categories, almost half of which represent learner factors; the other factors have far fewer categories. The results shown in columns 6 and 7 indicate that there is a great overlap between those categories identified in qualitative research and those identified in quantitative research, with almost all categories being taken up within quantitative approaches also. At the same time, the number of variables analyzed quantitatively clearly exceeds the number from qualitative studies, especially with regard to specifications of learner, context, and company factors (Table 2, columns 6 and 7).

In summary, the aggregated results indicate that the research appears to emphasize the influence of learner factors on premature termination of contract over other factors related to the company, school, or the apprentices' work and learning activities. In this regard, cross-country differences appear insignificant, with foci generally representing distinctions at the systemic level.

For some dropout categories, it is possible, and useful, to further elaborate their relation to premature termination of contract. At least some studies within the dataset report findings – beyond the descriptive results – that were extracted and summarized (see Appendix). For this effect size overview, we included (1) studies with a quantitative design reporting effect sizes, (2) a dropout category, if at least one study reported effect sizes for the respective category, (3) all values as they were reported within the original studies. On the basis of these criteria, we were able to provide an overview of effect sizes for 35 of the 68 dropout categories. Subsequently, those dropout categories that trace back to more than one result are discussed in detail.

Referring to the company factors, two studies confirm that low wages result in a higher probability of dropout (Kropp et al., 2014; Bessey & Backes-Gellner, 2015). With regard to professional factors potentially influencing dropout decision-making, two studies investigated whether the apprentices who dropped out had chosen a training occupation reflecting their dream job. Both studies confirm that those apprentices who are not trained in their dream job or who indicate not having a dream job show higher dropout probabilities (Beicht & Ulrich, 2008; Beicht & Walden, 2013). In regard to personal factors, related to individual biography, the dataset unanimously confirms that the lower the apprentice's educational level, the higher the dropout probability.[4] Concerning demographic details, effect sizes are comparable for several dropout categories. First, with regard to age, the majority of studies confirm that, with increasing age, the apprentices' probability of dropping out also increases. There are, however, a few exceptions.[5] Second, gender results in contradictory findings. Approximately half of the studies found that women have a lower dropout probability, the other half that men do.[6] Third, studies that investigate the apprentices' performance levels unanimously confirm that poor performance results in higher dropout probabilities.[7] Fourth, the majority of studies confirm that migration background increases the probability of dropout,[8] while just a few studies found the opposite or no effect.[9] Fifth, having children seems not to influence dropout decision-making (Cho et al., 2013; Yi et al., 2015). Beyond that, three studies show that a learning disability slightly increases dropout probability (Laporte & Mueller, 2011; Gambin & Hogarth, 2016; Greig, 2019), while high or low levels of non-cognitive skills seem to have almost no effect (Coneus et al., 2008, 2009). The studies agree that the context factor 'training occupation' is related to different dropout probabilities.[10] In respect to the unemployment rate, contradictory results were found (Bessey & Backes-Gellner, 2015; Coe, 2011; Greig, 2019; Laporte & Mueller, 2011).

Unfortunately, some dropout categories are too diverse for comparison purposes, i.e., the operationalization of the respective variables is too diverse, meaning that a detailed grasp of the particular studies is needed to interpret findings. This diversity applies to the company factors 'company size' and 'company's involvement', as well as to the personal factors 'professional experience', 'region', 'parents' education', 'club activity' and to health problems representing 'personal issues', as well as to the context categories 'form of training' and 'years in training'.

[4] Relevant studies: Beicht & Ulrich, 2008; Karmel & Oliver, 2011; Laporte & Mueller, 2011; Beicht & Walden, 2013; Kropp et al., 2014; Bessey & Backes-Gellner, 2015; Rohrbach-Schmidt & Uhly, 2015; Uhly, 2015; Gambin & Hogarth, 2016; Hjorth et al., 2016; Mischler & Schiener, 2016.

[5] Relevant studies: Coneus et al., 2008; Coneus et al., 2009; Coe, 2011; Karmel & Oliver, 2011; Laporte & Mueller, 2011; Kropp et al., 2014; Rohrbach-Schmidt & Uhly, 2015; Yi et al., 2015; Gambin & Hogarth, 2016; Hjorth et al., 2016; Mischler & Schiener, 2016; Greig, 2019.

[6] Relevant studies: Glaesser, 2006; Beicht & Ulrich, 2008; Coneus et al., 2008; Coneus et al., 2009; Coe, 2011; Karmel & Oliver, 2011; Laporte & Mueller, 2011; Bhawani & Sujan, 2012; Beicht & Walden, 2013; Kropp et al., 2014; Bessey & Backes-Gellner, 2015; Rohrbach-Schmidt & Uhly, 2015; Uhly, 2015; Yi et al., 2015; Gambin & Hogarth, 2016; Mischler & Schiener, 2016; Greig, 2019).

[7] Relevant studies: Glaesser, 2006; Beicht & Ulrich, 2008; Coneus et al., 2008; Coneus et al., 2009; Beicht & Walden, 2013.

[8] Relevant studies: Beicht & Ulrich, 2008; Beicht & Walden, 2013; Kropp et al., 2014; Bessey & Backes-Gellner, 2015; Rohrbach-Schmidt & Uhly, 2015; Uhly, 2015; Gambin & Hogarth, 2016; Mischler & Schiener, 2016; Greig, 2019.

[9] Relevant studies: Coneus et al., 2008; Coneus et al., 2009; Laporte & Mueller, 2011; Yi et al., 2015.

[10] Relevant studies: Beicht & Ulrich, 2008; Karmel & Oliver, 2011; Laporte & Mueller, 2011; Bhawani & Sujan, 2012; Beicht & Walden, 2013; Kropp et al., 2014; Rohrbach-Schmidt & Uhly, 2015; Uhly, 2015; Gambin & Hogarth, 2016; Greig, 2019.

5. Conclusion and limitations

Based on our results, we conclude that, from the apprentices' points of view, the possible causes for dropouts are diverse and heterogenous. Correspondingly, what most research activities in this context have in common is that they present a conglomerate of reasons, with an individual undergoing a decision-making process within VET where different options are weighed and finally making a decision about leaving the training prematurely. By means of a qualitative meta-synthesis, we identified 68 categories of dropout reasons in apprenticeships and structured them into a coherent dropout model. This map of dropout reasons can serve as an informative basis for researchers and practitioners. It provides them with a collection of possible reasons for dropout that have been investigated in both qualitative and quantitative research, allowing them to conduct further studies or plan interventions.

However, our model's comprehensiveness is limited to those dropout reasons that were identified in former research and that were identified through our systematic literature search. Thus, the model of dropout categories presented in this paper does not claim to be a normative model or empirically completely exhaustive. We, moreover, assume that, while the framework model used for this study should apply to every VET system, the relevance (effect sizes) of the identified categories depends on systemic and cultural factors. The model will, therefore, vary according to the specifics of the national VET systems and certainly the occupational specifics.

Summarizing the aggregated results regarding the current research foci within this map, we find that, while there is a clear focus on learner factors potentially resulting in dropout, less focus has so far been placed on the learning environment in the workplaces and at vocational schools. This finding suggests that research has mainly searched for dropout drivers within the individual instead of focusing on what educators and employers could improve. This one-sided focus is unfortunate as factors related to e.g. the quality of the learning environment would allow for adaptions to be made regarding training quality and learning conditions, which could also help prevent dropout during the training process. Even where research has focused on the learning environment, researchers have primarily been concerned with relatively static conditions, such as company size, wages, leave and overtime regulation. Meanwhile, daily working and learning conditions, such as the performance of training personnel, didactic methods, appreciation, or social integration at the workplace, are largely neglected.

It would be of interest not only to extract a map of possible reasons former research has investigated but also to gain an overview of the empirical effects individual dropout reasons exert on dropout. However, a systematic quantitative aggregation (quantitative meta-analysis) of results was impeded due to frequently missing information in the analyzed studies, particularly detailed correlation tables and the reporting of effect sizes in regression models. Instead, in the appendix, we give an overview of all effect sizes identified in quantitative studies and summarize the findings for eight dropout reasons where a synthetic description of results was plausible.

Results from that summary indicate that (1) a low training wage and (2) not being trained in their dream job increase the dropout probability, as do (3) an apprentice's low educational level, (4) a poor performance level within training, and (5) a learning disability. In addition, the majority of studies at least confirm that (6) increasing age and (7) a migration background are positively related to dropout. Moreover, studies find significant differences with regard to (8) the training occupation. Apart from these aspects, the low number of categories where clear implications can be drawn is unfortunate but inherent in the state of the research summarized in our paper. For the majority of dropout categories there are, to date, no quantitative results regarding their quantitative impact, just one result or even contradictory results. The problem of contradictory results applies, inter alia, to the dropout category 'gender'. In this case, differing results might be traced back to the analysis of different training occupations: It might not be gender itself that influences the dropout decision-making but the fact that a woman has chosen a training occupation typical for men, or vice versa. This example clarifies that, in many cases, an aggregation of effect sizes is impeded by the complexity and distinctiveness of dropout models with regard to different occupations, industries, countries, and societies.

We believe that another reason why some studies find no, quite different, or even opposing effects on dropout causes lies in a too global conception of "dropout". Particularly, dropout directions are usually not considered on a methodological level. Instead, prematurely terminated contracts are usually subsumed as a broad category. As a result, those apprentices whose dropout decision improved their situation (e.g. by attending a university) cannot be distinguished from those who left training without a better alternative (e.g. who are going to fall into unemployment). In these two contrasting cases, however, conclusions regarding dropout reasons may well differ: For instance, apprentices who quit to join a university might have been underchallenged by the complexity of work tasks administered during training, and a low complexity of tasks would trigger dropout in this subgroup. Inversely, for the subgroup of apprentices at risk of dropping out downwards, a high complexity of tasks might cause dropout. Analyzed as a single group (all apprentices with a premature termination of contract), the variable 'complexity of tasks' could either show no effect on dropout in a single study or differing or even inverse effects in different studies, depending on how the subgroups are distributed in the sample.

Based on the shortcomings identified in this paper on the state of research on dropout in VET, we encourage researchers and policy-makers to extend future dropout research by the following five aspects:

(1) More studies for each vocational field and across different vocational fields with a broad scope of included dropout variables would be desirable as they would allow for aggregated estimations of effect sizes.
(2) A more standardized reporting of coefficients and detailed background information on the dataset would facilitate interpreting and aggregating findings across studies.
(3) Using more multi-perspective approaches seems appropriate as different VET actors do not necessarily agree on dropout reasons. Hence, the framework model, which is actually limited to the apprentices' points of view, could be mirrored with models focusing on the different perspectives of other VET actors.
(4) For future dropout research to derive practical implications more precisely, we believe it is crucial to distinguish between and precisely measure different dropout directions. For most countries, the national training reports do not provide any information

on the type of dropout (e.g. an upward dropout to higher education or a downward dropout to unemployment). Likewise, research studies seldom distinguish different dropout directions in their measurement approach. This crucial information would allow us not only to know possible causes but also to specify the impact of reasons on distinct types of dropout.

(5) Most importantly, on the basis of our results, we recommend a closer examination of the activity factors as reasons for dropout, both at the workplace and in vocational schools. These factors have yet to be characterized in their relation to dropout and remain a large part of a black-box. Focusing on these factors seems particularly fruitful as they constitute more feasible starting points for dropout interventions designed by educators and employers than factors on the learner side, which are often given and cannot be influenced (e.g. gender, age, or a migration background).

(6) Finally, for the ultimate goal of reducing dropouts, it could be worthwhile analyzing existing dropout prevention programs regarding their general effectiveness but also considering their alignment to the dropout reasons identified through this study. Only then can an individual's dropout decision be adequately and comprehensively explained and – wisely addressed – indeed, in some cases, avoided.

CRediT authorship contribution statement

Svenja Böhn: Writing – original draft, Formal analysis, Data curation, Visualization. **Viola Deutscher:** Writing – review & editing, Conceptualization, Funding acquisition, Project administration, Supervision.

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Appendix A. Supplementary data

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