

# Work Package 1. Realist Literature Synthesis. Research Design

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## Introduction

WP1 reviews the international academic literature concerning the transfer and transferability of the dual apprenticeship model. Its aim is to address our project's central research question: *Can dual apprenticeships create better and more equitable social and economic outcomes for young people?* In service of this aim, a Realist Synthesis approach has been adopted. This is an approach which has been specifically developed as a means of reviewing research evidence on complex social interventions and is particularly attentive to the role of context in producing divergent outcomes (Pawson et al., 2004). Thus, Realist Synthesis allows us to go beyond identification of 'what works' or simply 'does it work?', and instead interrogate 'what works, for whom, in which circumstances and why?' It does so by focusing on the identification and extraction of causal mechanisms operating in particular contexts to produce specific outcomes - or Context-Mechanism-Outcome configurations (CMO-Cs) – that the literature theorises or empirically demonstrates lie behind the workings of an intervention. In the case of our research, this translates into an interest in *how dual apprenticeships work, for whom and why they generate different impacts in different contexts and beneficiary populations?* (Pawson et al., 2005). This process of unearthing the root causes of outcomes produces knowledge that can be used to direct future implementation of dual apprenticeships, including across distinct and varying contexts.

Central to this synthesis is a clear understanding and definition of what is meant by dual apprenticeships. Germany is often looked to as the archetype of dual apprenticeships and has made significant efforts to promulgate its own model internationally for many decades (Euler, 2013; Euler and Wieland, 2015; Mayer, 2001; Stockmann, 1997). However, the Austrian and Swiss systems have also been widely emulated (Gonon, 2012; Langthaler, 2015; Maurer et al., 2011) and are sometimes included in what is termed the 'Germanic' or German-speaking model (Gonon, 2014a, 2014b; Valiente and Scandurra, 2017), despite a great diversity of institutional configurations and historical trajectories in each national iteration (Busemeyer and Trampusch, 2012b). Nonetheless, there are several features of these three approaches that are sufficiently similar to each other, and distinct from other international examples of apprenticeships, as to render the 'German-speaking' umbrella useful. These include the "combination of strong school-based education with vocational training in the

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workplace; the intense coordination between social partners and the state in the governance of the system; and highly demanding occupational standards based on broad profiles of occupational competence” (Valiente et al. 2020: 164). In addition, while dual apprenticeship programmes exist in many places, Germany, Austria and Switzerland are rare examples of countries where dual apprenticeship is the largest and most typical form of VET provision (Gonon, 2014a). Indeed, these three countries can be distinguished for possessing a ‘Dual System’, i.e. “a more comprehensive, publicly organised and systematic interaction, which involves actors from politics, business and society” (Gonon, 2014a: 243), couched in a system of collective skill formation (Busemeyer and Trampusch, 2012a). This stands in contrast to the ‘Dual Model’, limited to cooperation and integration between two learning contexts (school and workplace) (Gonon, 2014a).

Crucially, a focus on the German-speaking dual systems becomes particularly relevant when examined through the lens of policy transfer. The model(s) of dual apprenticeship presented for transfer and emulation by international organisations (e.g. Axmann and Hofmann, 2013; European Commission, 2015; Hoeckel and Schwartz, 2010) are both explicitly linked to these ‘donor countries’ and involve hybridisation of their differing components. For example, while Denmark and The Netherlands also have important dual education systems, they are much less frequently used as the guiding model for transfer. Furthermore, the association of German-speaking European countries – all desirable examples of economic success – with a ‘gold standard’ of dual is no accident. This association serves to enhance the reputation of donor systems both at home and abroad and provides hard-to-contest legitimacy for the educational reform projects of recipient country actors (Dolowitz and Marsh, 1996; Gonon, 2014a; Valiente and Scandurra, 2017; Wiemann and Fuchs, 2018). Thus, dual apprenticeships have been used politically on an international scale to legitimise and affect change in ways that do not always resemble ‘donor’ models (which are themselves changing), but which are fundamentally shaped by a shared understanding of ‘what dual is’. Therefore, to speak of the Germanic model of dual apprenticeships, while to some extent reductive of contextual differences, is to recognise the working definition used in international policy transfer and the distinctiveness of dual apprenticeships (despite their internally heterogeneous forms) when compared to other models of TVET around the world (Steedman, 2012; Valiente and Scandurra, 2017). In addition, to speak of ‘dual transfer’ is not to anticipate complete replication of German-speaking ‘Dual Systems’ (Wieland, 2015), which some have even argued is impossible (Euler, 2013; Gonon, 2014). Instead, we refer to a broad “process in which knowledge about policies, administrative arrangements, institutions etc. in one time and/or place is used in the development of policies, administrative arrangements and institutions in another time and/or place” (Dolowitz and Marsh, 1996: 344), whether voluntary or coerced. This definition is intentionally inclusive of ‘soft’ and ‘hard’ forms of transfer (Stone, 2004) and is less concerned with discipline-specific semantic distinctions (Li and Pilz, 2021), intended to offer a means through which to capture the growing – but not always direct – influence of the dual apprenticeship model on VET policy reforms globally (Valiente and Scandurra, 2017).

Therefore, our selection of literature for synthesis is guided by an interest in the German-speaking or ‘Germanic’ systems – i.e. Germany, Austria and Switzerland – as donor contexts, against which other contexts/systems are compared or presented as (possible) policy recipients. Furthermore, our particular interest in outcomes for young people leads us away from the large number of technical reports that focus exclusively on the perspective of dual firms (usually German MNCs), which we exclude from our search (see ‘stage three: inclusion/exclusion criteria’).

## Research aims and questions

Our overarching research question in this work package is: *how do dual apprenticeships work, for whom and why do they generate different impacts in different contexts and beneficiary populations?*

In order to address this question, there is a need to map the current state of knowledge in this field for scope, quality and content. In other words, the *aims* of WP1 are to:

1. Review the literature discussing the transfer of dual apprenticeships across different contexts, including identifying research gaps.
2. Assess the utility of research and evidence regarding the functioning and impact of dual apprenticeships (especially for young people) across different contexts.
3. Identify and map the causal mechanisms and their anticipated outcomes proposed for dual apprenticeships in different contextual conditions and in the process of transfer.
4. Identify and map the different contextual levels at which dual mechanisms and outcomes operate and how those different levels interact/influence one another.

These aims translate into the following *research questions*:

1. Mapping the literature
  - a. What literature exists that discusses the transfer of dual apprenticeships across different contexts? How can this literature be characterised and what is its purpose? What research gaps remain?
  - b. What type and quality of research/evidence is presented in this literature, both empirical and conceptual? How does this advance our thinking for future research (e.g. underexplored methodologies, contested approaches etc.)?
2. Findings from the literature
  - a. How are the concepts of 'dual' and 'transfer' defined in the literature? How is the question of context(ual variation) addressed?
  - b. What causal mechanisms (CMO-Cs) are proposed in the literature about how dual apprenticeships work, for whom and with what outcomes across different contexts? What quality and scope of evidence exists to support these proposed mechanisms?
  - c. How does the literature address inequalities in outcomes for young people? What consideration is given to the role of context in producing/mitigating inequalities?

## Literature search and selection

### *Sources/databases*

In order to capture potentially divergent perspectives on dual transfer in different international literatures (Li and Pilz, 2021), a search was conducted for relevant research published in English, German and Spanish. The following databases were included in the search on the basis of their comprehensiveness and relevance to the topic and their selection was guided by the expert knowledge of the literature within the research team.

1. Scopus (English, Spanish)
2. Web of Science (English, Spanish)
3. ProQuest (English)

4. ERIC (English)
5. Literaturdatenbank Berufliche Bildung des BIBB (German)
6. Fachportal Pädagogik (German)

*Stage one: initial search*

In the interests of feasibility, we limited our search to journal articles, book chapters and reports (ERIC only) published since 2000 and conference proceedings published since 2017<sup>2</sup>. This strategy was also informed by the increased interest in dual apprenticeships in the international development and education fields in the new millennium and, in fact, our search revealed a significant spike in relevant publications since 2015 (see Figure 1).

The search parameters were chosen to capture our interest in the German and Germanic models of vocational education and dual models in general, incorporating various iterations of terms such as ‘apprenticeship’, ‘TVET’, ‘VET’ etc. in order to capture all possible relevant publications. An example of the parameters used in the Scopus search are given below.

*(German OR {German system} OR dual) W/15 (apprenticeship OR {TVET} OR {technical and vocational education and training} OR {technical education} OR {technical training} OR {technical college} OR {vocational education} OR {vocational training} OR {vocational work experience} OR {technical VET} OR VET OR {vocational education and training})*

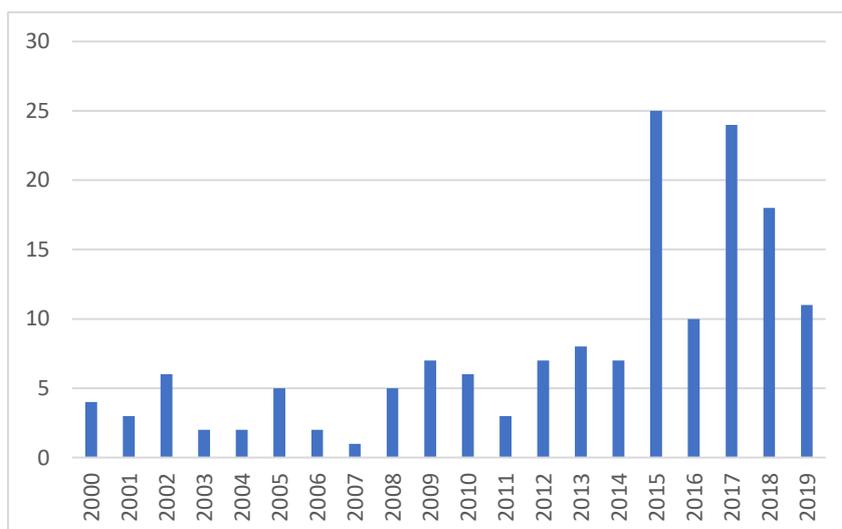
Limited to:

Article OR Book Chapter, from YR >=2000

Conference proceedings, from YR >= 2017.

Stage one of the search returned 1,042 English language, 76 German language and 15 Spanish language publications across the six databases (see Table 1).

*Figure 1. Distribution of publications by year (stage 2 results)*



<sup>2</sup> This was intended to capture research which may not yet have made its way into formal publication.

### Stage two: clean-up

In stage two, the results from each database went through a process of deduplication and manual search for relevance. The manual search was conducted on the basis of publication title, with any documents that were obviously unrelated to the dual model (in any country/context) and its transfer or comparison being removed.

Stage two of the search resulted in 156 English language, 35 German language and 15 Spanish language publications across the six databases (see Table 1).

### Stage three: inclusion/exclusion criteria

In the third and final stage, the titles and abstracts of the remaining publications were manually reviewed according to the following inclusion/exclusion criteria:

1. *Transfer criterion.* Is the publication focused on the transfer of the dual system across national borders? Transfer follows the definition previously outlined and includes, *inter alia*, replication of dual structures and practices, the adoption of dual policy principles and descriptive comparison as a basis for recommendations of ‘best dual practice’.
  - a. For inclusion, papers must focus on Germanic contexts as donor models, and non-Germanic contexts as recipients.
2. *Firm criterion.* For articles that meet criterion 1, is the primary or sole level of focus on companies/firms and their roles and outcomes? If YES, then we *exclude* such articles.

Stage three of the search resulted in 26 English language, 3 Spanish language and 23 German language publications across the six databases (see Tables 1 and 2). All of the returned English and Spanish language publications were selected for extraction. As the majority of German authors also publish in English, there is significant repetition of ideas across the English and German language literatures. Taking into account this and the more limited German-language capacity within the team, a purposive sample of 16 German-language papers were selected for extraction. These were selected on the basis of importance and where the same contribution, either partially or completely, had already been published in English, publications were not sampled. The selected German-language documents were used to triangulate findings from the English and Spanish literatures and ascertain whether important content had been overlooked or was exclusive to the German-language literature. Where further relevant publications were found through citations in the course of extraction, these were added to the sample (see Table 1). In total, 49 papers selected for extraction.

Table 1. Search and selection results

English language search				
Databases	Scopus	Web of Science	ProQuest	ERIC
Stage 1	387	291	145	219
Total	1,042			
Stage 2	76	32	11	37
Total	156			
Stage 3	26			
Sample for extraction	29 (3 added from citations)			
German language search				

Databases	BIBB <sup>3</sup>	Fachportal Pädagogik
Stage 1	37	39
Total	76	
Stage 2	35	
Stage 3	23	
Sample for extraction	16	
Spanish language search		
Databases	Scopus	Web of Science
Stage 1	4	11
Total	15	
Stage 2	15	
Stage 3	3	
Sample for extraction	4 (1 added from citations)	
Total papers for extraction = 49 (29 + 16 + 4), of which 12 were double extracted (10 Eng, 2 Span)		

Table 2. Summary of results of stage 3 inclusion/exclusion

	English	German	Spanish
Total papers	156	35	15
Included	26	23 (16 extracted)	3
Excluded	130	12	12
Single country/donor only focus	61	5	0
Not dual specific	19	2	1
Firm	13	3	1
Not available	11	0	1
Not transfer related	6	2	2
HE specific	3	0	0
Other	17	0	7

## Extraction and synthesis

Having completed the search and selection process, an extraction framework was developed based on the research questions outlined above, foregrounding the Realist Evaluation approach and the extraction of CMO-Cs. Given this focus, there was also a need to recognise that reality, i.e. context, is stratified into layers, with observable outcomes occurring only at the surface layer. The generative causal mechanisms that lie behind the manifestation of these outcomes, meanwhile, often lie at deeper ontological levels (Jagosh, 2019). In order to integrate this more complex understanding of context into our analysis, the following multi-level analytical framework was developed.

### *Multi-level analytical framework*

The Realist approach seeks to develop middle-range theories about interventions for change, foregrounding the role of context. Given the duality of apprenticeships, programmes straddle both economic and educational spheres and implicate a very extensive range of contexts (Wieland, 2015). Context, therefore, must be unpacked to explore how change operates in different societies,

<sup>3</sup> Literaturdatenbank Berufliche Bildung des BIBB

structures, cultures, institutions, populations et cetera and examine “causality [...] at different levels of sociological explanation” (Rolfe, 2019: 308). Our multi-level analytical framework allows us to grapple with the concept of causality and organise knowledge about change in an analytically feasible and useful way, while accounting for complexity and avoiding reductionism (Brante, 2001). The framework distinguishes between five ‘level ontologies’ at which mechanisms may operate within dual apprenticeship programmes (Brante, 2001; Rolfe, 2019). As Rolfe (2019: 308) outlines, organisation of knowledge about a programme into these levels “helps to identify when to reach ‘up’, ‘down’, ‘sideways’ and/or ‘back’ to identify relevant contextual factors and to consider which level of explanation is most useful in chains of causation.”

### *Cultural-historical*

This ontological level refers to the long-standing and cumulative contextual conditions that relate to the local, regional and/or (trans)national culture(s) in which dual apprenticeships are implemented. These historical processes and cultural norms can have profound impacts on how dual apprenticeships operate and what they can, or cannot, achieve in a given context. For example, a country’s history of industrialisation can impact its capacity to use a VET as a means to tackle unemployment and poverty (Allais, 2020), social attitudes towards vocational education can influence participation rates and the value of vocational qualifications (Billett, 2014; Fisher and Simmons, 2012), and (potentially competing) patterns of influence from colonial powers and international organisations can radically alter the form of education and economic systems (McGrath et al., 2020).

### *Political economy*

The second ontological level encapsulates contextual conditions concerning the organisation and nature of political and economic structures that relate to dual apprenticeships. For example, the distribution of power and responsibility between different skills system actors – e.g. state vs. market-led models – can greatly influence the design and implementation of different VET systems (Busemeyer and Trampusch, 2012a; Pilz, 2017). Similarly, the structure of national/regional labour markets (Allais, 2020) and the relationship between the public and private sectors of education and the broader economy (Remington, 2018) will have important consequences for dual apprenticeships.

### *Institutional*

The institutional level concerns contextual conditions related to the governance and inter-institutional organisation of dual apprenticeships. This might include the size and position of VET within national or regional education systems (Allais, 2020; McGrath et al., 2020), the process and timing of educational tracking between academic and vocational routes (Pilz, 2017; Pilz and Alexander, 2011), and the regulatory configuration of the labour market according to occupational specialisms or general competencies and thus the capacity for occupational mobility (Gekara and Snell, 2018; Mueller and Schweri, 2015).

### *Organisational*

The organisational level captures the intra-institutional conditions related to specific organisations/settings in which dual apprenticeships are implemented, principally (but not limited to) schools and workplaces. Examples include the size of training firms (Bishop, 2020), the embeddedness of particular learning tools and practices in a vocational school (De Bruijn and Leeman, 2011), and the international connections/origins of an MNC and their position in local subsidiary contexts (Fuchs, 2020; Tasli-Karabulut and Keizer, 2020).

### *Individual*

The final ontological level refers to the micro-level conditions relating to young people as actual or potential participants in dual apprenticeships. As such, this level captures how many of the outcomes of mechanisms at higher levels impact the aspirations, logics of action and decision-making of young people. Examples include students' levels of motivation or interest in (vocational) learning (Schaap et al., 2012), the impact of family obligations on learning choices, attendance etc. (Pantea, 2020), and prior experiences of the education system (Pantea, 2020; Schaap et al., 2012).

### *Developing the extraction framework*

In order to produce the final extraction framework (Appendix I), an iterative process of development, revision and redevelopment was followed. Initial extraction categories were suggested based on: i) practical bibliographic information requirements for data organisation; ii) the Realist Synthesis approach and the focus on identifying CMO-Cs; iii) the interest in a complex and multi-level understanding of context as outlined in the analytical framework above. For example, the inclusion of extraction categories for capturing descriptions of context (national/regional, institutional, organisational) and the organisation of extracted CMO-Cs according to the different level ontologies (see Appendix I) were choices informed by the multi-level analytical framework. This initial extraction framework was tested on six papers by different members of the research team to identify gaps and extraneous elements in its composition. Through this process, having recognised the high volume of conceptual compared to empirical publications, a separate section was created for information about empirical studies that could be left blank when not relevant. Furthermore, sections for extracting definitions of 'dual' and 'transfer' resulted from a growing recognition that these terms were varyingly and often poorly defined in the literature. Finally, the addition of information about the origins of CMO-Cs (see table 1 in Appendix I) was included to support robust and systematic mapping of CMO-Cs in later analysis (see 'synthetic analysis of the extractions'). After several iterative stages of testing the template in this way and discussing the results across duplicate extractions, the extraction template was finalised.

### *Completing extractions*

Extractions were completed by a four-person research team, which incorporated native fluency in English, German and Spanish. Of the 49 publications extracted in total, 25% (12) were double extracted by two different researchers to support consensus-building in the analysis. An example of an extraction can be found in Appendix II. Unfortunately, only English (10) and Spanish language (2)

papers could be double extracted due to limitations imposed by the language proficiency of the different researchers i.e. only one researcher spoke German. However, a number of completed extractions of German papers were reviewed and commented on by another member of the team in order to ensure full understanding and implementation of the framework. Furthermore, weekly data surgeries over a four-month period were used to discuss the findings of both single and double extractions and iteratively formulate the tentative synthetic analysis. Finally, the 'research reflections' section of the extraction framework was used as a site to record the development of ideas about synthetic analysis, highlight key quotes and make relevant observations that did not fit elsewhere in the template.

### *Synthetic analysis of the extractions*

Synthetic analysis of the extractions was an ongoing and parallel process to extraction. Firstly, as outlined above, the 'research reflections' section of the extraction template and the weekly data surgeries were used to record developing ideas about relationships between different documents and a profile of the literature landscape. Secondly, extracted CMO-Cs were organised into a database as extractions continued in order to begin to map the coverage, quality and nature of the literature as well as relevant findings contained within. The database was organised according to the ontological levels outlined above and the analytical framework elaborated in WP3 of this project (see Table 3). This framework was developed from Ryan's (2012) synthesis of the advantages of apprenticeships over full time vocational schooling for young people. He identifies three distinctive causal mechanisms that can explain the superior outcomes of apprenticeships: situated learning, skill content and institutional contact (for further elaboration of these mechanisms and their application to the transfer of dual apprenticeships, please see Valiente et al., 2020). In order to emphasise a focus on outcomes for young people, CMO-Cs at all levels were organised in relation to their connection to these mechanisms experienced at the individual level. For example, choices at the institutional level about how to coordinate governance between schools and employers ultimately impacts the ability of young people to benefit from institutional contact. Furthermore, by mapping the literature against this framework, it was possible to reveal gaps and mechanisms that remained unaccounted for (e.g. see 'Other' category in Table 1) by the WP3 framework.

Table 3. CMO-C database framework with selected example sub-mechanisms

	Situated Learning		Skill Content		Institutional Contact		Other
	Duality of Context (DC)	Work-Based Learning (WB)	Dual teacher education (TE)	Accreditation and Regulation (AR)	Career Progression (CP)	Coordination and Governance (CG)	Social Equity (SE)
Cultural-Historical (CH)							
Political Economy (PE)							
Institutional (IS)							
Organisational (O)							
Individual (ID)							

Extracted CMO-Cs were entered into the database according to the relevant sub-mechanism and ontological level and listed in order of entry, producing a unique code for each CMO-C (e.g. DC\_PE\_1). After each CMO-C, the Unique Identifying Number (UID) of the paper in which it could be found was listed, followed by the relevant CMO-C Quality Index (CQI) code (see Table 1 in Appendix I). If the same CMO-C was found across multiple publications, the relevant UIDs and CQI codes were added to the list following the coded CMO-C. This made it possible to map what CMO-Cs were present in the literature, in which publications they could be found, and what type/quality of evidence was used to support them, as well as what ontological level they operated at. Sub-mechanisms were developed iteratively as new CMO-Cs were entered, and any that did not relate to the three principal mechanisms were organised under 'Other' (see Table 1). Over time, some of these were clustered into new groupings that highlighted mechanisms unaccounted for in the original framework (analysis ongoing).

#### *Example of the analytical process*

In order to demonstrate the analytical process, here we present an extract from one of the selected papers and show how it is reconfigured as a CMO-C and entered into the framework.

Extract from paper E91:

*As the above descriptions indicate, vocational training in the dual system is characterized by close cooperation on many levels. The Principle of Consensus is a crucial aspect of the success of the dual system in Germany (Schlicht 1994). Interests of both employers and employees have been taken into account through legislation specifying that employer and employee representatives be present in equal numbers in all institutions and committees dealing with vocational training (Mtinch 1995). While this Principle of Consensus ensures that training regulations, once passed, are met with universal approval, it also makes the process of change within the system rather cumbersome.*

## CMO-C:

*When the principle of consensus is enshrined in legislation (m - resource) and these processes are accepted and adhered to by the relevant parties (c - implicit) the interests of both employers and employees are considered and represented in decision-making (m - response) helping to promote universal approval of training regulations but also making institutional change slow and cumbersome (o) – P2*

The CMO-C is marked as P2 in the CMO-C Quality Index: while most components are outlined in the original text, the context of acceptance and adherence is left implicit (P). In this case, secondary sources are used as supporting evidence (2).

Table 2. Example CMO-C from paper E91 (Lehmann, 2000) shown in database framework

	Situated Learning	Skill Content	Institutional Contact	
	Sub-mechanisms	Sub-mechanisms	Sub-mechanisms	Coordination and Governance (CG)
Cultural-Historical (CH)				
Political Economy (PE)				
Institutional (IS)				CG_IS_1: When the principle of consensus is enshrined in legislation (m - resource) and these processes are accepted and adhered to by the relevant parties (c - implicit) the interests of both employers and employees are considered and represented in decision-making (m - response) helping to promote universal approval of training regulations but also making institutional change slow and cumbersome (o) – E91 (P2)
Organisational (O)				
Individual (ID)				

The CMO-C is then entered into the database (see Table 2). In this case, the CMO-C relates to the 'Institutional Contact' mechanism, as the outcomes of this CMO-C provide the context for young people's contact with employers during their apprenticeship. If training regulations are mutually agreed and largely uncontested, then young people can focus on their learning and avoid friction with their host firm and other bodies. Conversely, if young people feel that current regulations are not in their best interests and seek to bring about change, then the lethargy of a system based on the principle of consensus could make this difficult or lengthy to achieve. In this case, the CMO-C has been entered into the *Coordination and Governance* sub-mechanism as it relates to the regulatory structures that govern contact between firms and young people. It is categorised under the 'institutional' level ontology as it relates to the inter-institutional organisation of dual apprenticeships. The final code for the CMO-C is a product of these categorisations: CG\_IN\_1.

The next stages and outcomes of this analysis are in process and will be detailed in a later report.

## Appendix I. Final extraction template

Paper #	
Authors	
Title	
Year	
Source ( <i>e.g. name of journal</i> )	
Type of Publication	
Inclusion Criteria	
Keywords	
Summary of purpose of paper	
Methodological approach ( <i>e.g. systematic literature review, qualitative study</i> )	
Country/context of origin	
Geographical scale	
Any description of <b>national/regional</b> context given	
Any description of <b>institutional</b> context given	
Any description of <b>organizational</b> context given	
Definition of dual	
Definition of transfer	
If paper contains empirical study/findings	
Nature of Programme	
Recipients ( <i>e.g. employers, 16-21 yr olds</i> )	
Findings  <i>(please note whether findings are qual/quant and include comments on quality of evidence)</i>	
CMO-Cs	
Description of identifiable or tentative CMO configurations  <i>(please add info about origin of CMO see table)</i>	<b>Cultural-historical</b>  <b>Political economy</b>  <b>Institutional</b>  <b>Organizational</b>

	<p><b>Individual</b></p> <p><i>Table 1. CMO-C quality index</i></p> <table border="1"> <thead> <tr> <th>CMO-C Type</th> <th>Code</th> <th>Descriptor</th> </tr> </thead> <tbody> <tr> <td>Complete, unreference d</td> <td>C1</td> <td>All components are explicitly outlined (i.e. C, M and O) and no secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Complete, referenced</td> <td>C2</td> <td>All components are explicitly outlined (i.e. C, M and O) and secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Complete, empirically evidenced</td> <td>C3</td> <td>All components are explicitly outlined (i.e. C, M and O) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.</td> </tr> <tr> <td>Partial, unreference d</td> <td>P1</td> <td>Two out of three components are explicitly outlined (e.g. C &amp; O but not M) and no secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Partial, referenced</td> <td>P2</td> <td>Two out of three components are explicitly outlined (e.g. C &amp; O but not M) and secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Partial, empirically evidenced</td> <td>P3</td> <td>Two out of three components are explicitly outlined (e.g. C &amp; O but not M) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.</td> </tr> </tbody> </table>	CMO-C Type	Code	Descriptor	Complete, unreference d	C1	All components are explicitly outlined (i.e. C, M and O) and no secondary references are provided to support the CMO-C.	Complete, referenced	C2	All components are explicitly outlined (i.e. C, M and O) and secondary references are provided to support the CMO-C.	Complete, empirically evidenced	C3	All components are explicitly outlined (i.e. C, M and O) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.	Partial, unreference d	P1	Two out of three components are explicitly outlined (e.g. C & O but not M) and no secondary references are provided to support the CMO-C.	Partial, referenced	P2	Two out of three components are explicitly outlined (e.g. C & O but not M) and secondary references are provided to support the CMO-C.	Partial, empirically evidenced	P3	Two out of three components are explicitly outlined (e.g. C & O but not M) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.
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	<p>Medium/high quality conceptual piece</p>	<p>A document with the primary purpose of providing a conceptual discussion of existing evidence on a topic, designed to support theoretical developments rather than offering a systematic overview of the literature. A common example would be descriptive context comparisons. Authors will provide clear and robust descriptions of any theoretical and other relevant context(s) (i.e. socio-economic, political, historical, geographical etc.) and base the majority of statements and conclusions on sound secondary evidence (e.g. low frequency of self-referencing, variety of sources, reasonable frequency of citations from high-quality, peer-reviewed sources etc.)</p>
	<p>Low quality conceptual piece</p>	<p>A document with the primary purpose of providing a conceptual discussion of a topic, designed to support theoretical developments rather than offering a systematic overview of the literature. A common example would be descriptive context comparisons. Theoretical and other relevant context(s) (i.e. socio-economic, political, historical, geographical etc.) may be poorly or inaccurately defined by the authors. The majority of statements and conclusions may be unreferenced and, when used, secondary referencing may be of poor quality (e.g. high frequency of self-referencing, narrow range of sources, high dependence on low quality, unreviewed sources etc.)</p>
	<p>Medium/high quality review</p>	<p>A document with the primary purpose of reviewing literature on a defined topic in a systematic way in order to outline the current state of knowledge in the field. This is not confined to traditional systematic reviews, but authors should use an organised, rigorous and consistent approach to selecting and analysing literature, outlined in a clearly-indicated methods section.</p>
	<p>Low quality review</p>	<p>A document with the primary purpose of reviewing literature on a particular topic in order to outline the current state of knowledge in the field. The specific topic and/or the approach to selection and analysis may be poorly defined and/or executed. A methods section may not be present.</p>
	<p>Medium/high quality empirical study</p>	<p>A document with the primary purpose of presenting empirical evidence developed by the authors from primary or secondary data. Authors should use an organised, rigorous and consistent approach to gathering and analysing data, outlined in a clearly-indicated methods section.</p>

	<p>Low quality empirical study      A document with the primary purpose of presenting empirical evidence developed by the authors from primary or secondary data. The approach to data gathering and analysis may be poorly defined and/or of low quality in design or execution. A methods section may not be present.</p>
Citations to follow up	

## Appendix II. Example extraction

Paper #	E153
Authors	Zhang, P.
Title	<b><i>The Vicissitude of German Vocational Education Law and Its Enlightenment to China.</i></b>
Year	2018
Source (e.g. name of journal)	Advances in Social Science, Education and Humanities Research, volume 195. International Seminar on Education Research and Social Science (ISERSS 18)
Type of Publication	Paper from seminar proceedings
Inclusion Criteria	Transfer
Keywords	N/A
Summary of purpose of paper	Describing the German VET legal system in order to demonstrate its superiority and provide an exemplary reference for VET law in China
Methodological approach (e.g. systematic literature review, qualitative study)	No description of methodology or specific approach. Highly descriptive account of German VET legislation followed by brief summary of lessons this should offer for China. Not a rigorous or critical take on either context.
Country/context of origin	China
Geographical scale	National – Germany and China
Any description of <b>national/regional</b> context given	<p><b>China</b> – Rapid industrialisation has increased the demand for professional and technical personnel → Technical skills mismatch</p> <p>‘The general public regards vocational education as an unrepentant alternative to ordinary education’ (295)</p> <p><b>Germany</b> – second country to complete industrialisation, a process which VET greatly contributed to.</p> <p>German government attaches significant importance to VET.</p> <p>Division and reunification of Germany have provided ‘bumps’ in the road of German VET development.</p>
Any description of <b>institutional</b> context given	<p><b>Germany</b></p> <p>Lengthy section describing the history and development of German VET law. Some key points:</p> <ul style="list-style-type: none"> <li>- Has a ‘detailed and complete’ (293) VET legal system.</li> <li>- VET originally deriving from religious reforms and educational nationalism, making it political.</li> <li>- Legal system characterised by close ties between state education and industry (duality) and ‘high level of professional affiliation and communication’ (293)</li> <li>- In-depth description of 2005 ‘Federal Vocational Education Law’</li> <li>- Existence of comprehensive legislation as federal and state levels.</li> <li>- VET managed by Ministry of Education and Ministry of Economic Affairs</li> <li>- The achievement of specific skills grades is a requirement for entry into skilled professions.</li> </ul> <p><b>China</b></p>

	Limited and patchy legal framework for VET.
Any description of <b>organizational</b> context given	N/A
Definition of dual	<p>Close cooperation and coordination between state education and employers to deliver integrated training, which is legally enshrined and regulated.</p> <p>“Dual system” is an embodiment of the deep school-enterprise cooperation in vocational education. It combines the traditional apprenticeship training mode with modern vocational education ideas and systematically cultivates the students’ technical ability and academic level.’ (294)</p>
Definition of transfer	N/A
If paper contains empirical study/findings	
Nature of Programme	N/A
Recipients ( <i>e.g. employers, 16-21 yr olds</i> )	N/A
Findings  <i>(please note whether findings are qual/quant and include comments on quality of evidence)</i>	N/A
CMO-Cs	
<p>Description of identifiable or tentative CMO configurations</p> <p><i>(please add info about origin of CMO see table)</i></p>	<p><b>Cultural-historical</b></p> <p>Negative cultural views of vocational education (c) hamper the participation of employers and students in the system (m – implied) making the implementation of VET law very difficult (o) – P1</p> <p>When a variety of relevant parties attach importance to the development of the VET system (c) negotiation and compromise become more possible (m), supporting more efficient and mutually beneficial operation of the system (o) – C1</p> <p><b>Political economy</b></p> <p><b>Institutional</b></p> <p>When teachers have strong professional knowledge and ethics (c) this increases their ability to work effectively with corporate partners (issues of trust and relevance) (m – implied) supporting the effectiveness of corporate participation in the Dual system (o) – P1</p> <p>The existence of clear, detailed and mutually-agreed legal framework for VET/Dual (concerning government, employers and schools) (c) supports clarity of and buy-in to the rights and obligations of all parties and allows for adjustment of interactions</p>

	<p>between the parties (m) fostering corporate participation, corporate responsibility and the promotion of quality education (o) – C1</p> <p>Careful planning of legal reforms and developments (c) minimises opportunities for conflict between existing and upcoming legal structures (m) supporting the pursuit of long-term goals within the Dual system (o) – C1</p> <p>Legislative regulation of VET financing (c) provides clarity and coordination between partners within the system (m -implied) supporting effective and smooth running of national VET programmes (o) – P1</p> <p>A clear legal framework of responsibilities (c) encourages employers to make a fair contribution to training (m) supporting ethical systems of responsibility (who profits, pays) and the continuous development and extraction of talent (o) – C1</p> <p>The existence of a rigorous and formalised legislative system for VET (c) can boost its image as a high-quality and legitimate educational option leading to valuable prospects (m) supporting participation in the system (o) – C1</p> <p>When students have a choice about which educational track to enter (c - implied) alignment of educational programmes with employment and labour market prospects (m) can help attract students to VET (O) – P1</p> <p>When formulating VET laws (c), the needs of different social groups should be considered (m) in order to align those needs and foster practical results in the VET system (o) – C1</p> <p><b>Organizational</b></p> <p><b>Individual</b></p> <table border="1"> <thead> <tr> <th>CMO-C Type</th> <th>Code</th> <th>Descriptor</th> </tr> </thead> <tbody> <tr> <td>Complete, unreferenced</td> <td>C1</td> <td>All components are explicitly outlined (i.e. C, M and O) and no secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Complete, referenced</td> <td>C2</td> <td>All components are explicitly outlined (i.e. C, M and O) and secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Complete, empirically evidenced</td> <td>C3</td> <td>All components are explicitly outlined (i.e. C, M and O) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.</td> </tr> <tr> <td>Partial, unreferenced</td> <td>P1</td> <td>Two out of three components are explicitly outlined (e.g. C &amp; O but not M) and no secondary references are provided to support the CMO-C.</td> </tr> <tr> <td>Partial, referenced</td> <td>P2</td> <td>Two out of three components are explicitly outlined (e.g. C &amp; O but not M) and secondary references are provided to support the CMO-C.</td> </tr> </tbody> </table>	CMO-C Type	Code	Descriptor	Complete, unreferenced	C1	All components are explicitly outlined (i.e. C, M and O) and no secondary references are provided to support the CMO-C.	Complete, referenced	C2	All components are explicitly outlined (i.e. C, M and O) and secondary references are provided to support the CMO-C.	Complete, empirically evidenced	C3	All components are explicitly outlined (i.e. C, M and O) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.	Partial, unreferenced	P1	Two out of three components are explicitly outlined (e.g. C & O but not M) and no secondary references are provided to support the CMO-C.	Partial, referenced	P2	Two out of three components are explicitly outlined (e.g. C & O but not M) and secondary references are provided to support the CMO-C.
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	Partial, empirically evidenced	P3	Two out of three components are explicitly outlined (e.g. C & O but not M) and empirical evidence presented in the paper (whether based on analysis of primary or secondary data) is provided to support the CMO-C.
Research reflections <i>(use this space to document any evolving analysis/synthesis, quotes of interest or relevant observations that do not fit elsewhere)</i>	<p>Extremely uncritical review of the German system – actively relies on tropes about German rationality and superiority e.g. ‘German vocational education has a long-term strategic goal, so that every law comes from rational thinking’ (294), German case as a source of ‘enlightenment’ for China.</p> <p>Only 5 citations.</p> <p>Seems most keen to adopt the aspects of the German system that correspond well with the highly centralized, authoritarian nature of Chinese governance.</p> <p>Indication of quality: multiple typos and poor English.</p> <p>Extremely normative – make claims about what a VET system ‘should’ look like with no explanation of why and no sources. For that reason, quite light on CMOs because in many cases, statements were so declaratory that they <i>only</i> offered a context or outcome, with no linking between different elements.</p>		
Paper quality index	Low quality conceptual piece		
Citations to follow up	N/A		

## References

- Allais, S. (2020). Skills for industrialisation in sub-Saharan African countries: why is systemic reform of technical and vocational systems so persistently unsuccessful?. *Journal of Vocational Education & Training*, 1-19.
- Axmann, M. & Hofmann, C. (2013). *Overcoming the Work Inexperience Gap Through Quality Apprenticeships – The ILO’s Contribution*, Geneva, Switzerland: ILO.
- Billett, S. (2014). The standing of vocational education: Sources of its societal esteem and implications for its enactment. *Journal of Vocational Education & Training*, 66(1), 1-21.
- Bishop, D. (2020). Firm size and workplace learning processes: a study of the restaurant sector. *European Journal of Training and Development*.
- Busemeyer, M. R., & Trampusch, C. (2012a). The Comparative Political Economy of Collective Skill Formation. In: M. R. Busemeyer & Trampusch, C. (eds.) *The Political Economy of Collective Skill Formation*. Oxford, UK: Oxford University Press, pp. 3-38.
- Busemeyer, M. R., & Trampusch, C. (Eds.) (2012b). *The Political Economy of Collective Skill Formation*. Oxford, UK: Oxford University Press.
- Brante, T. (2001). Consequences of Realism for Sociological Theory-Building. *Journal for the theory of social behaviour*, 31(2), 167-195.

- De Bruijn, E., & Leeman, Y. (2011). Authentic and self-directed learning in vocational education: Challenges to vocational educators. *Teaching and Teacher Education*, 27(4), 694-702.
- Dolowitz, D., & Marsh, D. (1996). Who learns what from whom: a review of the policy transfer literature. *Political studies*, 44(2), 343-357.
- Euler, D. (2013). *Germany's Dual Vocational Training System: A Model for Other Countries [Das duale System in Deutschland–Vorbild für einen Transfer ins Ausland]*. Gütersloh: Germany: Bertelsmann Stiftung.
- Euler, D., & Wieland, C. (2015). *The German TVET System: Exportable Blueprint or Food for Thought?* Gütersloh, Germany: Bertelsmann Stiftung.
- European Commission. (2015). *High-Performance Apprenticeships and Work-Based Learning: 20 Guiding Principles*, Brussels, Belgium: European Commission.
- Fisher, R., & Simmons, R. (2012). Liberal conservatism, vocationalism and further education in England. *Globalisation, societies and education*, 10(1), 31-51.
- Fuchs, M. (2020). MNCs' open international strategy–local dynamics: transfer of German “vocational education and training” to emerging economies. *critical perspectives on international business*.
- Gekara, V., & Snell, D. (2018). Designing and delivering skills transferability and employment mobility: the challenges of a market-driven vocational education and training system. *Journal of Vocational Education & Training*, 70(1), 107-129.
- Gonon, P. (2012). Policy Borrowing and the Rise of a Vocational Education and Training System: The Case of Switzerland. In: Steiner-Khamsi, G. & Waldow, F. (Eds.) *World Year Book of Education 2012 – Policy Borrowing and Lending in Education*. London: Routledge, pp. 191–205.
- Gonon, P. (2014a). Development Cooperation in the Field of Vocational Education and Training – The Dual System as a Global Role Model? In: M. Maurer & P. Gonon (Eds.) *The Challenges of Policy Transfer in Vocational Skills Development: National Qualifications Frameworks and the Dual Model of Vocational Training in International Cooperation* (1st Edition). New York, NY: Peter Lang AG, pp. 241-259.
- Gonon, P. (2014b). What Makes the Dual System to a Dual System? A New Attempt to Define VET through a Governance Approach. *Berufs-und Wirtschaftspädagogik*, 25. Retrieved from: [https://www.zora.uzh.ch/id/eprint/103538/1/gonon\\_bwpat25.pdf](https://www.zora.uzh.ch/id/eprint/103538/1/gonon_bwpat25.pdf)
- Hoeckel, K., & Schwartz, R. (2010). *Learning for Jobs: OECD Reviews of Vocational Education and Training*. Austria: Organisation for Economic Co-Operation and Development (OECD).
- Jagosh, J. (2019). Realist synthesis for public health: building an ontologically deep understanding of how programs work, for whom, and in which contexts. *Annual review of public health*, 40, 361-372.

- Langthaler, M. (2015). *The Transfer of the Austrian Dual System of Vocational Education to Transition and Developing Countries: An Analysis from a Developmental Perspective*. Working Paper, Austrian Foundation for Development Research (ÖFSE).
- Lehmann, W. (2000). Is Germany's dual system still a model for Canadian youth apprenticeship initiatives?. *Canadian Public Policy/Analyse de Politiques*, 225-240.
- Li, J., & Pilz, M. (2021). International transfer of vocational education and training: a literature review. *Journal of Vocational Education & Training*, 1-34.
- Maurer, M., Arnold, R., Gonon, Ph., Michaelowa, K. & Wieckenberg, U. (2011). Evaluators' Final Report. In Swiss Agency for Development and Cooperation (Ed.), *Evaluation 2011/2: SDC's Vocational Skills Development Activities*. Bern: Swiss Agency for Development and Cooperation.
- Mayer, C. (2001). Transfer of Concepts and Practices of Vocational Education and Training from the Center to the Peripheries: The Case of Germany. *Journal of Education and Work*, 14(2), 189–208.
- McGrath, S., Ramsarup, P., Zeelen, J., Wedekind, V., Allais, S., Lotz-Sisitka, H., Monk, D., Openjuru, G., & Russon, J. A. (2020). Vocational education and training for African development: a literature review. *Journal of Vocational Education & Training*, 72(4), 465-487.
- Mueller, B., & Schweri, J. (2015). How specific is apprenticeship training? Evidence from inter-firm and occupational mobility after graduation. *Oxford Economic Papers*, 67(4), 1057-1077.
- Pantea, M. C. (2020). Perceived reasons for pursuing vocational education and training among young people in Romania. *Journal of Vocational Education & Training*, 72(1), 136-156.
- Pawson, R., Greenhalgh, T., Harvey, G., & Walshe, K. (2004). *Realist synthesis: an introduction*, ESRC Research Methods Programme, University of Manchester. Retrieved from: <https://www.semanticscholar.org/paper/Realist-synthesis-an-introduction-...>
- Pawson, R., Greenhalgh, T., Harvey, G., & Walshe, K. (2005). Realist Review - a New Method of Systematic Review Designed for Complex Policy Interventions. *Journal of Health Services Research & Policy*, 10(1), 21–34.
- Pilz, M. (2016). Typologies in comparative vocational education: Existing models and a new approach. *Vocations and Learning*, 9(3), 295-314.
- Pilz, M. (2017). Policy borrowing in vocational education and training (VET)–VET system typologies and the “6 P Strategy” for transfer analysis. In *Vocational Education and Training in Times of Economic Crisis* (pp. 473-490). Springer, Cham.
- Pilz, M., & Alexander, P. J. (2011). The transition from education to employment in the context of stratification in Japan—a view from the outside. *Comparative Education*, 47(2), 265-280.
- Remington, T. F. (2018). Public–private partnerships in TVET: adapting the dual system in the United States. *Journal of Vocational Education & Training*, 70(4), 497-523.
- Rolfe, S. (2019). Combining Theories of Change and Realist Evaluation in practice: Lessons from a research on evaluation study. *Evaluation*, 25(3), 294-316.

- Ryan, P. (2012). Apprenticeship: between theory and practice, school and workplace. In: Pilz, M. (Ed.) *The Future of Vocational Education and Training in a Changing World*. New York, NY: Springer, pp. 402–432.
- Schaap, H., Baartman, L., & De Bruijn, E. (2012). Students' learning processes during school-based learning and workplace learning in vocational education: a review. *Vocations and learning*, 5(2), 99-117.
- Steedman, H. (2012). Overview of apprenticeship systems and issues. *ILO contribution to the G20 task force on employment*. Geneva, Switzerland: ILO.
- Stockmann, R. (1997). The Sustainability of Development Projects: An Impact Assessment of German Vocational-Training Projects in Latin America. *World Development*, 25(11), 1767–1784.
- Stone, D. (2004). Transfer agents and global networks in the 'transnationalization' of policy. *Journal of European public policy*, 11(3), 545-566.
- Tasli-Karabulut, V., & Keizer, A. (2020). Multinational corporations as institutional entrepreneurs: the dynamic interplay between automobile firms and the Turkish vocational education and training system. *Industrial Relations Journal*, 51(3), 153-168.
- Valiente, O., López-Fogués, A., Fuentes, H., & Rosado, R. (2020). Evaluating dual apprenticeship effects on youth employment: A focus on the mechanisms. In: Pilz, M. & Li, J. (Eds.) *Comparative Vocational Education Research*. Wiesbaden, Germany: Springer VS, pp. 163-180.
- Valiente, O., & Scandurra, R. (2017). Challenges to the Implementation of Dual Apprenticeships in OECD Countries: A Literature Review. In: M. Pilz (Ed.) *Vocational Education and Training in Times of Economic Crisis*. New York, NY: Springer, pp. 41–57.
- Wieland, C. (2015). Germany's dual vocational-training system: Possibilities for and limitations to transferability. *Local Economy*, 30(5), 577-583.
- Wiemann, J., & Fuchs, M. (2018). The export of Germany's "secret of success" dual technical VET: MNCs and multiscalar stakeholders changing the skill formation system in Mexico. *Cambridge Journal of Regions, Economy and Society*, 11(2), 373-386.