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Teaching through 'powerful knowledge' in vocational higher education: tensions of 'relational' approaches in China

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ABSTRACT

This study addresses the problem of knowledge practices in Chinese vocational higher education institutions (HEIs) by using Bernstein's notion of a 'pedagogic device'. China's distinctive context is characterised by a hybrid mix of discipline-based and competence-based curricula, providing a unique opportunity to explore the tensions inherent in a 'relational' approach. One specific concern is epistemic and social relations behind curriculum choices. A qualitative study of 29 experienced teachers revealed that government curriculum policies have led to the emergence of two types of vocationally oriented HEIs with differentiated knowledge foundations, of which teachers' perceptions are influenced by the structure of occupational practice and the profiles of specific learners. The findings revealed that teaching through 'powerful knowledge' in vocational higher education goes beyond merely emphasising systematic knowledge. Instead, it necessitates acknowledging the role of power in defining what knowledge should/should not be taught and who is permitted access to it.

本研究基于伯恩斯"教学机制"理论，系统解构中国高等职业教育的知识实践逻辑。中国高等职业院校的特殊性体现于学科本位课程与能力本位课程的二元融合特征，这一制度张力为审视"关系型"课程范式中的内在张力提供了关键切入点。通过对29名高职院校资深教师展开深度访谈，本研究特别关注课程决策背后的认知关系与社会关系逻辑。国家课程政策催生出两类具有差异化知识基础的职业院校，但教师的课程实践受到职业场域特征与学习者认知图式的双重形塑。在职业教育领域中，通过"强有力知识"进行教学不仅需要教师关注系统性知识本身，更应该重视权力在知识再语境化过程中的规制作用 – – 即决定何种知识应被纳入课程体系，以及哪些群体有机会获取知识。

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1. Introduction

Reflecting on the global landscape of higher education, where the prominence of disciplinary, specialised, and systematic knowledge has been diluted amidst the proliferation of competence- or outcome-based frameworks, 'powerful knowledge' accounts advocate a knowledge-based approach to the curriculum (Muller and Young 2014; Young 2008;

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Young and Muller 2014). This curriculum model serves as a guide for the 'curriculum of the future', rooted in the 'Future 3' scenario, arising from critiques of undersocialized 'Future 1' and oversocialized 'Future 2' (Young and Muller 2010). Future 1 initially referred to the traditional academic curriculum directed towards transmitting disciplinary knowledge. In contrast, Future 2 is associated with competence-based and application-driven frameworks, which make knowledge less perceptible and drive curricula ever closer to the 'concreteness of the world' and 'context of human action' (Gamble 2013, 213). Future 3 aims to provide all students access to 'powerful knowledge', which is 'fallible' and 'open to change', and its development is 'bounded by the epistemic rules of the particular specialist communities' (Young 2014, 67). The acquisition of this knowledge will allow 'independence of thought from a material base' (Bernstein 2000, 27), envisaging alternative and new possibilities (Young 2008).

Recently, several scholars have doubted that this portrayal of curriculum futures is too stage bound, with each future seemingly progressing into the next in a linear, natural fashion; instead, accessing powerful knowledge is through 'dialectic' (Muller 2022, 9) or 'relational' (Nordgren 2021, 180) methods rather than a binary model. However, the impact of merging different curriculum approaches with distinct epistemic orientations and knowledge interests remains unclear. The question is particularly relevant in Chinese contexts, where a blend of discipline-based and competency-based curriculum models exists in vocational-oriented higher education institutions (HEIs) (e.g. Müller 2021, 2024; Schmidtke and Chen 2012; Zhang 2021). This unique setting offers an opportunity to explore tensions in the 'relational' approach and assess the dual focus on epistemic and social relations underpinning curriculum choices.

Research on curriculum knowledge and how it is differentiated in vocational-oriented HEIs has been most active in South Africa and later in the UK and Australia (c.f. Allais 2014; Blackie and Luckett 2022; Gamble 2013; Hordern 2016; Shay 2013; Wheelahan 2010; Young 2008). Unlike South Africa, which thoroughly embraced a whole version of National Vocational Qualifications (NVQs) through an employer-driven approach (Allais 2014), China ultimately adopted a more hybrid version and fused a competence-based approach with preexisting concept-oriented elements inherited from the Soviet model (Müller 2021). Some reported that Confucian education traditions were primarily immune to the pressure to develop outcome-based qualification frameworks found in anglophone countries (Schmidtke and Chen 2012). Others, however, find that the priorities of upskilling with employer-driven 'learning outcomes' and 'competencies' have become mainstream in vocational higher education policy, college strategies and curriculum discussions (Wang 2023; Zhou and Xu 2023). In these discussions, the question of knowledge is almost invisible.

The main objective of this study is to explore what happens to knowledge in the 'relational' curriculum and teaching practices in Chinese vocationally oriented HEIs. The curriculum is approached here not only as an actual curriculum corpus and documents (e.g. Shay 2013; Wheelahan 2010; Allais 2014) but also as a dynamic and social process that necessitates teachers' nuanced understanding of learners' presence and aspirations, aims of education, the nature of the labour market, etc. Knowledge is seen as reflecting the social and epistemological assumptions behind curriculum choices, which are socially produced and acquired in a particular sociohistorical context while having properties that go beyond present interests and practices (Young 2008). Knowledge is then

transformed into pedagogic discourse with its internal orderings through recontextualizing rules, which are also linked to the levels of pedagogic practice (Bernstein 2003). Therefore, curriculum knowledge is explored primarily from the accounts of teachers, who are encouraged to articulate their approaches to the curriculum through various curriculum initiatives.

The present study addresses the problem of teaching through 'powerful knowledge' among Chinese vocationally oriented HEIs. The relationship between knowledge relations and broader social relations will be discussed. The following questions guided the analysis: how are different forms of knowledge legitimated when a hybrid version of the discipline-based approach ('Future 1') and competence-based approach ('Future 2') to the curriculum is created? Contributing to this debate on the role of knowledge in teaching in HEIs, the findings of this study suggest that the knowledge question is an important component, but not enough; attention is needed to unravel the power relations that regulate access to powerful knowledge.

2. The evolution of vocational curriculum policies in China

Historically, China lacked a strong domestic tradition in occupationally oriented HEIs. It imported Soviet-style institutions such as comprehensive polytechnic schools for workers in the early 1950s (Chen 1981; Thøgersen 1990). Their graduates were automatically assigned lifelong jobs in the urban work unit (danwei) system, with the primary purpose of training mid-level bureaucrats, office managers, and technocrats in their units. The Soviet model, however, was then criticised for being too theoretical to be relevant to the demands of workplace contexts and thus weakened during the Cultural Revolution (Chen 1981; Gamberg 1977). Similarities can be identified between the Soviet model and 'Future 1', both featuring static academic subjects with rigid and predetermined boundaries, without direct control by agencies formally representing industry needs.

In the 1980s, the concurrence of a lack of technical skills and high levels of hidden and open unemployment motivated new curriculum policies. These policies included the expansion of vocational middle schools, which played a pivotal role in imparting elite knowledge to a select cohort, primarily destined for secure employment within state-owned enterprises (Thøgersen 1990, 100; World Bank 1989, 38f). These vocational middle schools were modelled on the Soviet comprehensive polytechnic schools. In these schools, categories of work were introduced in various ways, without direct control by agencies formally representing 'the needs of industry', and the 'pure' sciences were regarded as important for their specific content, dominated by the exploration of the notion of the 'application' of principles (Schmidtke and Chen 2012).

Towards the end of the 1990s, several changes took effect simultaneously, greatly increasing pressure to make the vocational curriculum more responsive to the labour market and thus more aligned with 'Future 2'. These changes include reforms of state-owned enterprises, persistent labour market informalization, and premature expansion of vocational higher education, in which well-performing vocational middle schools were merged and upgraded to colleges (Durden and Yang 2006; Liu and Hardy 2023). At the same time, the breakdown of lifelong job assignments, alongside the rapid expansion of higher education, has disadvantaged the position of graduates from

occupationally oriented HEIs in the job market (Mok and Qian 2018). In the 2000s, vocational HEIs struggled with enrolling students and irrelevant practical training and skills mismatches, which motivated the Chinese government to look for new policy options for vocational education (Liu and Hardy 2023).

To pave the way for extensive labour market reforms, the Ministry of Labour introduced English-style NVQs, whereas the Education Commissions leaned towards Germany's dual apprenticeship training system (Müller 2021). After 1994, the absence of overt conflict facilitated a seamless learning process from intricate English system frameworks, yet the influence of these foreign elements permeated primarily the blue-collar sector (Zhang 2021). However, companies have long voiced dissatisfaction with the quality of vocational graduates' skills, and labour turnover prevents many companies from investing in training and cooperative projects (Müller 2024; Sheldon and Li 2013). The occupational standards of the planned economy merged with English NVQs, creating a system of skill formation widely deemed ineffective (Young and Allais 2013; Zhang 2021).

Finally, the government adopted a hybrid version of the English NVQs, integrating it with existing domestic elements, and implemented it extensively across China. For instance, vocational schools maintained their discipline-based curricula but increasingly mandated that students attain vocational qualifications before graduation (Huang 2007). While the notion of functional analysis as a superior method for developing a curriculum was introduced, it was not fully implemented (Wang 2007). Against this backdrop, the current study delves into the attributes and structures of knowledge imparted in Chinese vocationally oriented HEIs.

3. Differentiation of knowledge between vocationally oriented HEIs

The differentiation of knowledge in different HEIs defines their goals and the access they provide (Muller and Young 2014; Shay 2013). The divide between 'sacred' and 'profane', context-free and context-dependent knowledge has a long history in curricular debates (Gamble 2009; Shay 2015; Young 2008; Young and Muller 2014). It is often assumed that education at research-intensive universities relies on curricula predominantly located in context-independent theoretical knowledge, whereas vocationally oriented HEIs emphasise context-bound practical knowledge, focusing on useful industrial applications (Annala 2023). Nevertheless, some scholars have questioned whether this is an overdichotomized view (e.g. Allais 2014; Muller and Young 2014; Shay 2013, 2015). This is because, regardless of whether education programmes are seen as preparing for a specific occupation, theoretical and conceptual bodies of knowledge are important in educational preparation and can support the development of broader fields of occupational practice (Allais 2014; Wheelahan 2010; Young 2008).

Both theoretical and practical knowledge can be 'principled' or 'proceduralized' (Gamble 2009; Muller 2009; Shay 2013; Shay et al. 2011). There is principled procedural knowledge that emphasises principles emerging from the codification of practice, in contrast to proceduralized principled knowledge, where procedures are derived from theory rather than practice (Shay et al. 2011, 97). Acknowledging the conceptual content in procedural knowledge (Muller 2015, 2022), the theory points to the possibility of occupationally oriented curricula constituted by systematic and principled knowledge.

This nomenclature is particularly relevant to China since the vocational institutions borrowed from the Soviet model in the 1950s largely remain on a conceptual basis. Such HEIs, however, have been under incessant attack, as they fail to include learning in workplaces as a constituent element of vocational education and thus obstruct upskilling (Stewart 2015; Wu and Ye 2018). Under the authority of vocational subject specialists in schools and colleges, the work-related curriculum would ignore that it must assemble its knowledge base from a range of sources and take into account a wider range of 'stakeholder' demands (Hordern 2016) and, crucially, ignore the impact of workplace contexts on how occupation is performed (Muller 2009). On the other hand, the newly established vocational-oriented HEIs in the mid-1990s happily embraced English-style NVQs and were detached from disciplinary knowledge content and grounded in precise job function descriptions, emphasising procedural knowledge (Allais 2014; Wheelahan 2010).

We can assume that vocational-oriented HEIs upgraded from old vocational middle schools in the 1950s had a differentiated knowledge base from those newly established since the 1990s. However, previous research has demonstrated that the nature of an institution does not guarantee the property of curriculum knowledge; instead, it is a question of knowledge practices (Clegg 2016; Shay 2015).

4. Pedagogic device: the meaning potential of curriculum knowledge

The dynamics involved in the curriculum-making process and decisions on knowledge can be characterised by Bernstein's (2000) 'pedagogic device', which regulates the potential knowledge discourse available to be taught and learned (Luckett and Blackie 2022). For Bernstein, pedagogic device brings together how knowledge is differentially distributed ('distributive rules'), transformed into a curriculum with certain meaning potential ('recontextualizing rules'), and taught to students ('evaluative rules') (Bernstein 2000; Singh 2002). Whilst it is crucial to understand that the pedagogic device operates at the societal level rather than within individual institutions (Singh 2002), what is distinctive about universities and colleges as educational institutions is that all three rules can be produced within a single institution (e.g. Annala 2023).

Distributive rules focus on the field of production, which places boundaries (classifications) around the 'sacred' knowledge to protect it from everyday knowledge (the 'profane'). Bernstein (2000) characterises the nature of everyday knowledge as 'horizontal discourse' composed of 'strategies' and 'procedures' that are segmentally organised, 'context dependent, and specific' (p.157), thus lacking coordinating principles in the integration of meanings. In contrast, 'vertical discourse' refers to specialised, symbolic, and systematic knowledge that 'takes the form of a coherent, explicit, and systematically principled structure'. Of significance is the strength of the classification demarcating the categories of horizontal and vertical discourses, as well as the form of knowledge generated within these categories (Muller 2015).

Recontextualizing rules focus on the field of recontextualization, in which a new educational order is constituted through selectively appropriating, relocating, refocusing, and relating discourses. Bernstein's (2000) notion of recontextualization illustrates how disciplinary knowledge is reconceptualized and rearranged into pedagogic texts, with knowledge boundaries phrased as classification. Nevertheless, the influence of

classification on teaching can be modulated by framing, which pertains to the control exerted over the selection, sequencing, and pacing of the knowledge imparted within pedagogical relationships (Bernstein 2003, 80). Different forms of realisation can either restrict or enhance the potential discourse available to be pedagogised, depending on the 'orders of meaning' (Shay 2013) and the conditions of pedagogic contexts (Shay 2015).

Evaluative rules provide frames for students' eventual attainment and condense the meaning of the pedagogic device (Bernstein 2000). Pedagogic practice requires continuous evaluation of the knowledge transmitted and acquired, and evaluation raises questions about what ultimately counts for successful performance. Consequently, all three rules are hierarchically related, creating a site for exercising power to regulate the forms of knowledge accessible by students.

An important aspect of the pedagogic device is that knowledge is decontextualised from its site of production – whether it is a research publication, scientific laboratory, design studio, or factory floor – and transformed into a curriculum (Ashwin 2022). This process of delocation and relocation requires choices about selecting dominant, 'legitimate' knowledge and ways of structuring knowledge (Apple 2004; Misiaszek 2022). The deeper-rooted reasons why certain epistemologies are reproduced and how knowledge is (de)legitimised by the goals we strive towards in vocational HEIs are the key questions here. Furthermore, as highlighted by political economy theory, the structure and nature of the skill formation system are influenced by a myriad of interconnected factors, including labour market regulations, societal perceptions of occupations and competencies rooted in sociocultural norms, and historical industrial traditions (Streeck 2012; Thelen and Busemeyer 2011). Thus, we presume that the move from a Soviet knowledge-based to a competence-based training model is not a conceptually seamless exercise; instead, curriculum development encompasses conflicting discourses that compete to define what is viewed as a 'legitimate' curriculum.

5. Data and analysis

The study on which this paper is based focuses on 29 teachers' insights into vocational curriculum and knowledge. The participating teachers were selected by convenience sampling from five vocational colleges that are part of the 'Double High Plan' – a strategic initiative launched by China's Ministries of Education and Finance in 2019. The 'Double High Plan' aims to identify and financially bolster a select cohort of exemplary vocational institutions and majors at the national and provincial levels, positioning them as pioneers in driving vocational education reform (Li, Zheng, and Xiong 2023). The study's diverse participant pool comprises one college designated under the national double high plan (College A), three colleges under provincial double high plans (College B, College C, College D), and a college that belongs to the provincial high-level major plan (College E). There are two old vocational colleges (OVCs) upgraded from technical schools established during the 1950s (College B, College E) and three new vocational colleges (NVCs) that were established after the 1990s (College A, College C, and College D). This diversity in the types of colleges underscores the comprehensive yet focused nature of the study, illuminating various facets of vocational education curricula.

Information about the curriculum documents was collected from the degree programmes and college websites. Curriculum documents (185 pages) were used as secondary data, whereas interviews were used as primary data. The first author conducted semistructured narrative interviews with teachers with the following characteristics (Table 1): 18 from traditional vocational institutions and 11 from newly established vocational institutions. Twenty-two participants were from science, technology, engineering, and mathematics (STEM) programmes, and seven participants were from the humanities, arts, and social sciences (HASS) programmes. All the participants had at least five years of teaching experience. Twenty participants had teaching positions (professors, lecturers, and instructors), and nine had leadership or administrative

Table 1. Biographical information of the 29 interviewees.

TEACHERS	TEACHING EXPERIENCE (YEARS)	DEGREE	TEACHING POSITION	ADMINISTRATIVE POSITION IN THE COLLEGE
COLLEGE A-STEM-1	12	Doctor	Associate professor	Teacher leader
COLLEGE A-STEM-2	10	Doctor	Lecturer	
COLLEGE A-HASS-3	10	Master	Associate professor	
COLLEGE A-STEM-4	15	Master	Associate professor	
COLLEGE B-STEM-1	18	Bachelor	Associate professor	Teacher leader
COLLEGE B-STEM-2	15	Bachelor	Instructor	
COLLEGE B-STEM-3	29	Bachelor	Lecturer	
COLLEGE B – HASS-4	9	Master	Lecturer	
COLLEGE B-HASS-5	16	Master	Associate professor	Teacher leader
COLLEGE C-HASS-1	32	Bachelor	Associate professor	Director of teaching affairs
COLLEGE C-STEM-2	20	Master	Professor	Teacher leader
COLLEGE C-STEM-3	18	Master	Associate professor	
COLLEGE D-HASS-1	18	Master	Professor	Vice director
COLLEGE D-STEM-2	6	Master	Associate professor	
COLLEGE D-STEM-3	22	Bachelor	Professor	
COLLEGE D-HASS-4	19	Master	Lecturer	
COLLEGE E-STEM-1	20	Bachelor	Associate professor	
COLLEGE E-STEM-2	9	Master	Associate professor	
COLLEGE E-STEM-3	19	Master	Associate professor	
COLLEGE E-HASS-4	12	Master	Associate professor	
COLLEGE E-STEM-5	15	Bachelor	Associate professor	
COLLEGE E-STEM-6	21	Master	Professor	Director of teaching affairs
COLLEGE E-STEM-7	6	Master	Lecturer	
COLLEGE E-STEM-8	22	Master	Professor	Teacher leader
COLLEGE E-STEM-9	14	Master	Associate professor	
COLLEGE E-STEM-10	6	Master	Lecturer	
COLLEGE E-STEM-11	6	master	Lecturer	
COLLEGE E-STEM-12	19	Bachelor	Lecturer	Teacher leader
COLLEGE E-STEM-13	11	Master	Associate professor	

positions. Two had doctoral degrees, sixteen had master's degrees, and seven had bachelor's degrees. All participants signed consent forms before the interviews were conducted. The necessary ethical approval was obtained from the institution's ethics committee, of which the authors are affiliated.

The thematic interviews adhered to a structured format, mirroring the curriculum development process: beginning from its inception, progressing through experiences and perspectives on curriculum-making, and culminating in the implementation of the curriculum in teaching. Throughout the interviews, emphasis was placed on knowledge and knowledge practices, with inquiries focused on what types of knowledge they deemed crucial in curricula, how they succeeded in integrating them, and how they made choices on knowledge in their teaching practice. Prior to the interviews, the teachers were required to provide preliminary information about the course curricula they had been teaching, and these documents were reviewed. Concrete course examples were employed to facilitate discussion on the abstract question of knowledge. The recorded interviews ranged in duration from 45 to 120 minutes.

The methodology employed was guided by Bernstein's (2000) notion of a 'translation device', which facilitates the interaction between empirical research data and theoretical concepts. Bernstein delineates between the internal language of description, encompassing concepts and theory, and the external language of description, which directly relates to the empirical realm. The internal language of description remains distinct from the data and is interpreted through the translation device, allowing for an iterative research process where data and participants can influence and reshape the theoretical model (Luckett and Blackie 2022). The first author approached the translation of the concepts (internal language of description) into a series of themes (external language of description). Initially, both authors immersed themselves in the data and conducted thorough coding. Following this, the authors focused their analysis on the descriptions in which the informants discussed 1) the significance, origin, and legitimacy of the knowledge they deemed crucial (distributive rules); 2) choices regarding knowledge and knowledge practices in curriculum development (recontextualizing rules); and 3) assessments of students' achievements (evaluative rules). Establishing convictions between the internal and external languages necessitated multiple iterations between theory and data. Data citations were coded according to the institution (College A, B, C. D or E), disciplinary field (HASS/STEM), and number of interviewees. The results are structured according to the rules of pedagogic devices.

6. Findings

6.1. The distributive rules of knowledge

The origins of curriculum knowledge were topics that the teachers discussed during curriculum making. Teachers' talk reflected the 'pure' and 'profane' division between the knowledge interests. The analysis revealed distinctive distributive rules, creating a basis for curricula in different HEIs and emphasising proceduralised principled knowledge at the OVC and principled procedural knowledge at the NVC. In other words, the governing logic of the curriculum at the OVC is theory; at the NVC, it is the world of practice.

A course outline of 'Equipment Manufacturing' provided an interesting example of OVC and NVC, clearly differentiated in their curriculum type. The OVC aimed to 'qualify the workforce who will acquire solid foundational scientific knowledge' (College B) and 'specialized knowledge of mechanical engineering' (College E). In line with the orientation to knowledge at OVC, most programme members viewed the completion of an academic programme as synonymous with qualifications for practice with the following statement: 'The studies prepare you to work, and while studying, you gain something, and after that, you can delve deeper into the intricacies of the workplace' (College B-STEM-2). At the NVC, the course was designed to 'strengthen students' knowledge and skills relevant to manufacturing, designing, and repairing the equipment' (College A). Knowledge was depicted as industry-related, practice-based, and contextual: 'basic knowledge' was articulated as mechanical design and drawing and organisation around projects that relate directly to the workplace. As an informant put it, 'we all know we cannot go deeper into theory, and in fact, what's practical suffices' (College C-STEM-3).

The principled base of the curriculum at the OVC emerged from a conceptual or theoretical knowledge base, and increasing complexity was achieved by increasing conceptual complexity and ensuring more complex contexts of application. The hierarchy was theory privileged over practice. As a teacher noted, '[t]he cornerstone of our efforts lies in the transmission of theories and upon this solid base, we delve deeper into the intricacies of the workplace' (College E-STEM-12). This informant referred to 'theory' by providing examples of digital electricity, analogous circuitry, and electrotechnics. The teacher observed that these courses were 'university-like' since their bases feature more substantial systematic context-independent knowledge:

> 'We would expect of the expert, not the proficient practitioner, in that the expert would be better able to cope with different situations. Without the fundamental theoretical underpinning, our endeavours risk resembling mere mimicry – attempting to replicate without true understanding, akin to drawing a dipper by merely tracing the outline of a gourd'. (College B-STEM-1)

At the OVC, understanding and applying knowledge were both considered important when solving practical problems in the occupational field. Teachers reflected that 'theory' had an important role in teaching and learning. However, even though 'expertise is attainable through in-depth learning, akin to the pursuit of knowledge within an academic curriculum' (College E-STEM-6), theoretical knowledge has to be related to its social context and relevance. Engineering followed several standards, requiring knowledge of how to apply them in practical contexts and specialised knowledge from teachers. The process entailed moving from abstractions and generalisations with meanings that were less dependent on context to specific and concrete cases. Teachers accepted the relevance of working life in the higher education curriculum, yet this relevance was founded upon context-free principled knowledge.

At the NVC, the knowledge hierarchy differed from that at the OVC: the aim was to extract knowledge from its work context and translate it into a curriculum, which entailed transforming context-bounded practices into a set of principles or procedures for these practices. Teachers at the NVC stressed 'a holistic knowledge of how one does things' (College C-STEM-3), which could circulate easily and allow the work of

the hand to be set out in procedural terms. For example, in a tourism programme, the curriculum aimed to provide a set of principles and guidelines that students were to apply to simulated tasks. Students were given examples of different events (e.g. introducing classical Chinese gardens) and were taken through a series of 'how-tos' for management. Teachers stressed that mastery of 'hands-on skills' (College D-STEM-2) constituted a crucial competitive advantage for vocational students, as it was vital for vocational graduates to transition into the workplace and execute tasks seamlessly upon graduation (College A-STEM-2).

Here, the curriculum base emerged from procedures, and increasing complexity was achieved through more complex applications in various contexts. Knowledge is considered pivotal when it can be formulated as competencies that serve the needs of the industry and the field of work. This perspective on knowledge features a weak classification between schools and working life, prioritising procedural or principled procedural knowledge (Gamble 2009; Shay et al. 2011).

6.2. The recontextualizing rules of knowledge

When knowledge was recontextualized into pedagogic practice, descriptions of the intended learning outcomes were negotiated and translated into an enacted curriculum. The recontextualizing rules construct official knowledge and its relation to pedagogic practice (Bernstein 2000). Next, how principled knowledge and procedural knowledge are transformed into actual pedagogy is reported from the sequence and pace of knowledge in the field of recontextualization.

Both the OVC and NVC participants denoted 'a huge and enlarging divide between students' preexisting knowledge and the theoretical concepts being taught' (College E-STEM-2). Since its inception, vocational education has been viewed as a stagnant path in terms of social advancement, burdened with a mission that, to many, appeared to be a 'sacrifice' (College C-HASS-1), fostering acceptance of industrial manual labour as a decent means of livelihood while curbing the pursuit of knowledge that could lead to an esteemed position. This sentiment is so ingrained that even rural parents hesitate to enrol their children in vocational institutes, 'reserving this option only when entry into academic high schools becomes unfeasible' (College A-HASS-3). When academically inclined students shun vocational education paths, along with an increasing number of students from vocational secondary schools entering vocationally oriented HEIs, both inadvertently lower the quality of vocational students:

> 'It is astonishing to acknowledge the fragile foundation of my students' knowledge – they resemble kindergarteners in some respects. At the outset of a class session, I posed a seemingly straightforward question: "What percentage is half of one?" Shockingly, one student responded with 20%. Disconcertingly, he was not the only one harbouring this misconception! Several others agreed with his answer … ' (College E-STEM-11)

At the OVC, significant curriculum and pedagogical challenges arose in the recontextualization of theoretical knowledge for vocational purposes. There were considerable variations in the methodologies employed by OVC teachers in regard to recontextualizing knowledge. Some held opposing views regarding students' expectations, which focused primarily on practical knowledge. A teacher argued that these two aspects are not mutually exclusive; for instance, many engineering students require practical work

involving electronic design, yet 'they lack even the most basic understanding of circuit principles' (College E-STEM-8). Others stressed the imperative 'to clearly articulate the practical relevance' (College B-STEM-2), ensuring that 'learning transcends mere theory and becomes inherently action-oriented' (College E-STEM-5). This approach necessitated a shift in focus, moving away from abstract theoretical immersion and initiating lessons with more tangible, approachable tasks, facilitating a smoother progression towards understanding complex concepts. As one informant at the OVC noted, merely recognising that the significance of conceptual knowledge is insufficient; it is also crucial to 'consider how teachers can be supported in transforming practical workplace knowledge within the curriculum' (College B-HASS-5). The fact is that 'most teachers at vocational colleges have no prior working experience in the workplace field'; 'neither do they have sufficient time to be involved in the industry practice in their quest for promotion in academic titles' (College E-STEM-9).

At the NVC, teachers considered the importance of having practical courses from the starting phase and aimed for context-bound knowledge and marketing curriculum by being practical. Teachers introduced strategies to 'provide students with a simulated real-world problem to solve' (College A-STEM-4) so that 'progression in the curriculum must account for its relationship to the contexts of application'. The promotion of college administration strengthened this reiteration of project-based learning. All the NVCs asked their teachers to be involved in assessing their teaching skills to ensure that all the teachers adopted a competence-based training model.

Nevertheless, according to a participant, 'the experimentation with a competence-based curriculum model is a failure' (College A-STEM-1). When procedural knowledge was incorporated into the curriculum, the flow of ideas would be constrained, regardless of the individual classroom teachers' level of innovation.

> 'We had a so-called leaflet textbook composed of a sheet with work assignments. Practices from the workplace have been codified into a series of simple procedures. Our students might proficiently execute the procedure but never comprehend how and why it works'. (College A-STEM-2)

The prevalence of a competence-based training model at the NVC was also influenced by educators' belief that their students had little interest in learning systematic knowledge: 'If you teach abstract concepts and theoretical frameworks, they soon get bored' (College C-STEM-3). However, as an informant at the OVC aptly observed, the fact is that 'our teachers are not well-equipped to acquaint our students with the complex concepts' (College E-STEM-1).

6.3. The evaluative rules of knowledge

The data utilised in this study did not permit the examination of students' eventual attainment but rather teachers' conceptions and experiences while offering an evaluative perspective on the qualities of the two vocationally oriented HEIs. The evaluative rules shared by NVC and OVC were aligned with the concept of what staff identified as a 'T-shaped student' (College C-STEM-2) or 'T-shaped curriculum' (College E-STEM-2), a reference to the growing demand on curricula to broaden the knowledge and skill base of graduates. Underlying these analogies is the stress of applying common, generic knowledge across various working contexts, followed by specialisation in a

specific field. The term 'generic' indicates that workers across different settings 'share a common knowledge base' (College B-STEM-2) and 'common competencies' (College D-HASS-4).

At the NVCs, the weak classification between schools and the workplace led to a misalignment in curriculum knowledge, as students were introduced to unstructured and improperly paced knowledge. As various scholars have argued (Young 2008; Muller 2015), such curricula deny students access to powerful knowledge that enables new, unimagined ways of thinking to face unpredictable situations. In STEM-related courses, vocational training programmes focus on general skills by 'strictly following the outdated NVQ standards' (College D-HASS-4), thus failing to accommodate industry and firm specificities. At the same time, there was a notable emphasis on the character of 'knowers'. The participants at NVC emphasised the importance of 'cultivating virtues of humility and resilience when confronted with challenging workplace conditions' (College C-STEM-2). Given factories' frequently unfavourable working environments, students' proficiency in enduring hardships is perceived as a competitive advantage over university graduates. Challenges arose in HASS, where no professional institutions are dedicated to collectively evaluating and disseminating principled practical knowledge. In response, most required 'theoretical' courses in the HASS focused on general procedural knowledge, including writing, etiquette, language, and management. This generalist conceptualisation was reflected in the content of numerous mandatory courses, with approximately 30% of the total focusing on generic domains of occupational practice, such as social responsibility, cultural literacy, and entrepreneurship.

The participants at the OVC argued that when the curriculum base was centred on theoretical knowledge, its 'relevance to working life becomes evident at a later stage' (College B-STEM-1). Students would gain more theoretical background knowledge through which they could, for example, disengage from everyday experience, question taken-for-granted assumptions, and later renew them. Specialisation was depicted as an advanced phase of occupational preparation, occurring on the job and through further educational pursuits.

> 'I can envision that our students may lack the practical knowledge required in the workplace, resulting in gaps in their skill set. For instance, if asked to repair a machine, they might not provide immediate answers initially due to their limited experience. However, when faced with altered or additional conditions, they can provide the correct response because they understand the rationale behind specific checkpoints'. (College B-STEM-3)

The approach adopted by the OVC could be described as emphasising generic skills, yet it maintains a visible connection to theoretical and conceptual knowledge. This generic curriculum aligns with staff members' consistent assertions that vocational graduates must be prepared for a wide range of possibilities rather than focusing solely on a specific specialisation (College E-STEM-13). While the preparation programme was primarily generic, specialisation occurred through on-the-job induction within a particular organisation (College B-STEM-1). Students were often described as having acquired 'generic tools' to address specific topics or fields (College B-HASS-5). This finding is also aligned with powerful knowledge accounts, which claim that any work that requires autonomy and application necessitates a broad education that transmits bodies of knowledge (Allais 2014; Gamble 2013; Young 2008). All these generic skills required in the

workplace are highly related to systematic knowledge and address the importance of approaching curriculum knowledge comprehensively.

Nevertheless, teachers at the OVC who wrestled with the concept of a curriculum centred on conceptual knowledge expressed concerns that it might undermine the quality of occupational preparation, fearing that it would 'fall short of the dedicated technical institutes focused only on vocational skills development' (College E-STEM-12). Simultaneously, as highlighted by an informant, the duration of studies, spanning three years at vocational colleges (inclusive of at least one year of apprenticeship) and four years at research universities, has laid a distinct groundwork for their accomplishments (College E-STEM-9). Increasingly, these watered-down versions of disciplinary knowledge eclipsed the significance of work-related principled knowledge in nurturing a proficient workforce.

7. Discussion

This study explored knowledge and knowledge practices in Chinese vocationally oriented HEIs where the 'relational' approach to the curriculum between the discipline-based model ('Future 1') and competence-based model ('Future 2') prevails. The variations in social order observed among the five HEIs highlight the intricate interplay between disciplinary power and organisational control in the curriculum change processes. Curriculum structures, as well as social structures, serve as gatekeepers, facilitating access to the powerful knowledge demanded by the job market alongside the foundational knowledge necessary for acquiring such knowledge. Access to powerful knowledge is paramount in vocational education, as it enables learners to handle systematic specialised knowledge and develop analytical capabilities and other transferable skills across diverse workplace settings (Wheelahan 2010; Young 2008).

The findings show that government decisions in curriculum policy created two types of vocational-oriented HEIs with different foundations for knowledge. The newly established vocational colleges (NVCs) after the 1990s were engaged with the competence-based approach as an end. This approach can also be linked to 'generic mode' (Bernstein 2000, 53), which prioritises 'trainability', where the curriculum relies more on the principle of market relevance for selecting knowledge for occupational preparation and less on an inner orientation to the field of knowledge (Wheelahan 2010). This approach thus eventually severs the links with the specialised discourse that could be used to conceive alternative forms of occupational practice (Young and Muller 2014).

On the other hand, teachers in colleges that were upgraded from the previous comprehensive polytechnic schools (OVCs) were engaged with the application-driven, learner-centred approach as a mediator for a knowledge-based approach to the curriculum. One should see it as a remarkably realistic appraisal of educational and occupational opportunities; the curriculum may have the potential to be both highly 'educational' in terms of providing access to disciplinary knowledge and 'relevant' to the workplace by ensuring students' long-term employability in a broader labour market. While this approach to curriculum may offer a form of stability during periods of flux in knowledge production and practice dynamics, when addressing multiple new advancements in disciplinary knowledge, with a limited amount of space and time to integrate that knowledge into a curriculum and effectively communicate it to students, there are risks to the conceptual

coherence in the curriculum (see also Muller 2009, 2015; Wolff and Luckett 2013). As a result, many technical curricula have become mere 'diluted versions of similar academic curricula in universities', supplemented by 'a handful of additional classes focused on vocational specialization' (College E-STEM-5).

The study further emphasised that educators' perceptions of knowledge are profoundly embedded within the structure of occupational practice, which is moulded by the fundamental conditions of work (Streeck 2012). Our OVC participants concurred that access to knowledge is crucial and that a curriculum grounded in theoretical foundations will eventually demonstrate its relevance in the professional realm. Notably, most OVC institutions are attached to state-owned manufacturing enterprises, which provide high-quality jobs and foster collaboration between schools and firms across various employers within the industry (Durden and Yang 2006). Despite significant pressures to address broader agendas beyond disciplinary concerns, flexible arrangements encouraged educators to avoid an overly narrow focus on firm-specific skills in workforce training. Instead, they were prompted to integrate curricular content that emphasised core areas of principled knowledge and skills.

In contrast, NVC participants have already redirected their curricula towards a more employment-oriented approach, mainly focusing on generic practical or procedural knowledge to secure their jobs. This perception can be partly explained by the general ambiguity concerning the purpose of practice, deriving from the fact that numerous occupations receive substantial labour market rewards despite having weak knowledge foundations (Hu and Vargas 2015). As China rapidly evolves into the 'world's factory' within the global economy, the past four decades have focused primarily on the low-skilled, labour-intensive manufacturing sector, which has increased export revenues, indicating a persistent demand for a low-skilled workforce (Xu, Qin, and Li 2021). Under these conditions, NEC educators are reluctant to impart complex disciplinary knowledge, often adopting the mindset of 'what's practical suffices' (College C-STEM-3), thereby emphasising a pragmatic approach shaped by the nature of employment. These perceptions underscore the complexities involved in defining the knowledge base required for employment, primarily due to the uncertainty surrounding the objectives of workplace practice and the highly contextual nature of specific job vacancies.

Furthermore, powerful knowledge is a crucial starting point, but any curriculum must also be designed with learners in mind. The specific learner profiles make teachers grapple with the challenge of striking a delicate balance between preparing students for the workforce and equipping them with the fundamental building blocks of learning. Determining what should be prioritised in the sequencing and selection of knowledge in the curriculum becomes very complex. Additionally, recognising the intricate interplay of power relations in defining who qualifies as a 'learner' is important. This becomes evident when teachers withdraw their teaching from vocational students, who are frequently stigmatised as 'stupid and lazy youth' (Woronov 2016), 'bad seeds' (Wang 2021), or 'kindergarteners' (College E-STEM-11), as reported in this study. Such practices reinforce damaging stereotypes and resonate with criticisms that specialised knowledge primarily reflects the elite's endorsed perspectives, thereby exacerbating educational inequity.

Powerful knowledge accounts urge the curriculum to be foregrounded in disciplinary scientific knowledge, which is more powerful than other knowledge, regardless of its

origins (Young 2008; Young and Muller 2014). While the mastery of specialised knowledge can provide labour market shelters for given occupations, there is no simple correlation between the scientific accuracy and rigour of this knowledge and the rewards or protection received by certain groups of workers in the labour market, which is instead a product of power relations. Power relations also affect who is permitted access to powerful knowledge, 'what' knowledge is considered to be powerful and 'how' this knowledge is transmitted. Crucially, the transformation of knowledge as it moves between the different rules of pedagogic devices means that power plays an important role in this process. This insight provides space to challenge those who use authority to simply assert what should be included in a curriculum on the basis of an imagined cannon. This, in turn, opens up space to consider why particular aspects of disciplinary and occupational knowledge have been selected and excluded from a curriculum and why particular voices and experiences of the operation of that knowledge have been amplified or silenced.

8. Conclusion

Expanding access to powerful knowledge stands as a cornerstone value in higher education, irrespective of students' backgrounds or the type of HEIs they attend. Merely asserting the significance of traditional disciplinary principles or occupational procedural knowledge is insufficient to facilitate such access. Instead, it necessitates acknowledging the role of power, transcending fixed epistemological perspectives, and continuously adapting to the dynamic environment. This acknowledgement was recognised by Huang Yanpei, a renowned vocational education reformer at the turn of the twentieth century in China, who stated, 'if one asks how one should do vocational education, then one has to ask the other way around: what kind of vocation do you want to do? At which place do you want to train what kind of people' (Huang 1933, 2)? This does not suggest that knowledge should be excluded from vocational curricula. Instead, it emphasises the substantive social bases preconditioning the implementation of this principle, which goes beyond mere technical adjustments in teaching and learning activities. These challenges stem from broader societal issues. Consequently, adopting a knowledge-based approach to the curriculum ('Future 3') to enhance occupational preparedness cannot solely rest with teachers and schools but should be recognised as a collaborative effort integrating governmental involvement, workforce organisations and educational activities.

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