

THEMATIC PAPER: APPRENTICESHIP

Redesigning vocational curriculum: A program cluster-based approach for higher vocational colleges in China

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ABSTRACT

The construction of program clusters has become the main approach for higher vocational colleges to implement the cultivation of comprehensive technical talents, with the most important aspect being the integration of curricula between different programs. Based on field investigation and case study, we found that developing program clusters mainly follow the pathway of aligning with enterprise job standards, observing working process, focusing on typical work projects, drawing capability map, updating curriculum content or developing new curriculum content, and adopting the curriculum framework of "platform + module + direction". However, due to the different links of the industrial chain that program clusters served, the curricula will also present a different structure. We inductively identified three types of curriculum frameworks, the mutual integration module curriculum that serves the short and complete industrial chain, the separate module curriculum that serves the long and complete industrial chain, and the mixed module curriculum that serves the midstream and downstream of the industrial chain.

Key words: program clusters, curriculum, China, higher vocational colleges

INTRODUCTION

In China, vocational education and training (VET) predominantly operates through a school-based model under the administration of the Ministry of Education (MOE). Within this framework, programs serve as the foundational building blocks of VET, providing students with standardized learning pathways to cultivate occupation-specific competence and facilitate career readiness. The VET programs in China mainly cover 17 fields, including agriculture, civil engineering and architecture, machinery and equipment manufacturing, food, transportation, electronics and information technology, *etc.* (MOE, 2021). However, as the phenomenon of occupations clustering becomes increasingly pronounced, the demand for cross-sector competence has emerged, leading to a broadening of

programs boundaries. Recent studies have indicated that many of the VET programs in China seemed to be focused primarily on the specific competence students need for their first job and did not provide the depth and breadth of skills that would be needed to move up in a career (Stewart, 2015). For students, a single program learning can no longer meet the needs of evolving industrial development.

To change the traditional development of "solo combat" centered on single program, and effectively promote the orderly and coordinated development among programs, China has introduced measures for the construction of program clusters in higher vocational colleges (Pan, 2020). This initiative has been driven forward through a series of policies and project implementations. A particularly notable example is the Opinions on Implementing

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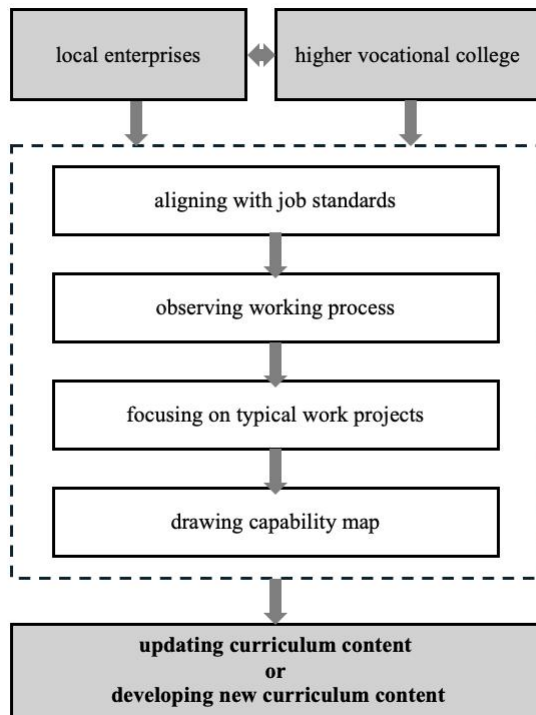


Figure 1. The path for determining curriculum content of program clusters.

the Plan for the Construction of High-level Vocational Colleges and programs with Chinese Characteristics (commonly known as the "Double High Plan"), issued in 2019. This policy proposes a five-year cycle focused on building program clusters, steering VET in China toward significant contributions in serving national strategies, integrating into regional development, and promoting industrial upgrading (MOE, 2019). A program cluster refers to a grouping formed by a certain number of programs with sharing intrinsic relevance. programs, like the cells of a living body, are the core elements of the cluster (Song, 2021). Since program clusters include multiple programs, redesigning the curriculum from a "group" perspective has become the core task. This requires higher vocational colleges to focus on the needs of regional industries, adopt a work process-based approach to organize 3-5 related programs into a cluster, and then re-integrate the curriculum.

To better elaborate on this research, it is also essential to clarify the concept of curriculum. The term "curriculum" originates from the Latin word "currere", referring to the route and process of student learning. With the evolution of school education, the concept of curriculum has become increasingly complex. In the literature on curriculum theory, there is no universally accepted definition of curriculum. For the purposes of this paper, we have selected a concept of curriculum that

aligns with the scope of our research question. Specifically, curriculum typically comprises two key elements: curriculum content and curriculum structure. Based on this conceptual framework, this paper proposes the following two questions: how do higher vocational colleges determine the curriculum content and curriculum structure of program clusters? Ultimately, what kind of curriculum framework was ultimately formed?

METHODS AND RESEARCH DESIGN

In response to the research questions, this paper uses field investigation and case study analysis. As the first five-year cycle of "Double-High Plan" entered the acceptance stage in 2024, the second round of "Double-High Plan" is about to be launched, which requires higher vocational colleges to readjust their program clusters in accordance with the needs of regional industries. Consequently, since October 2024, we have been participating in the adjustment of over 10 program clusters of many higher vocational colleges, and now we have collected some important first-hand information through field supervision, including the demand for talents in the relevant industries of various program clusters, the current situation of program offerings in higher vocational colleges, as well as their teaching resources available. Based on these case materials, we have gained an in-depth understanding of designing curricula of program clusters centered on the industrial chain and have inductively identified the curriculum framework of "platform + module + direction".

RESULTS

Determination of course content and course structure

A well-structured curriculum encompasses two fundamental dimensions: content selection (what knowledge and skills are delivered) and pedagogical sequencing (how these elements are ordered for optimal learning progression). This comprehensive approach ensures learners with a coherent "developmental trajectory" toward competency attainment. Unlike standalone program curriculum, the curricula of a program cluster is based on the reintegration of various program curriculum, making it more complex and challenging.

For a program cluster, its content is mainly determined by the path of "aligning with enterprise job standards—observing working process—focusing on typical work projects—drawing capability map—updating curriculum content or developing new curriculum content" (Figure 1). The participants include both teachers from the higher vocational colleges and employees from local

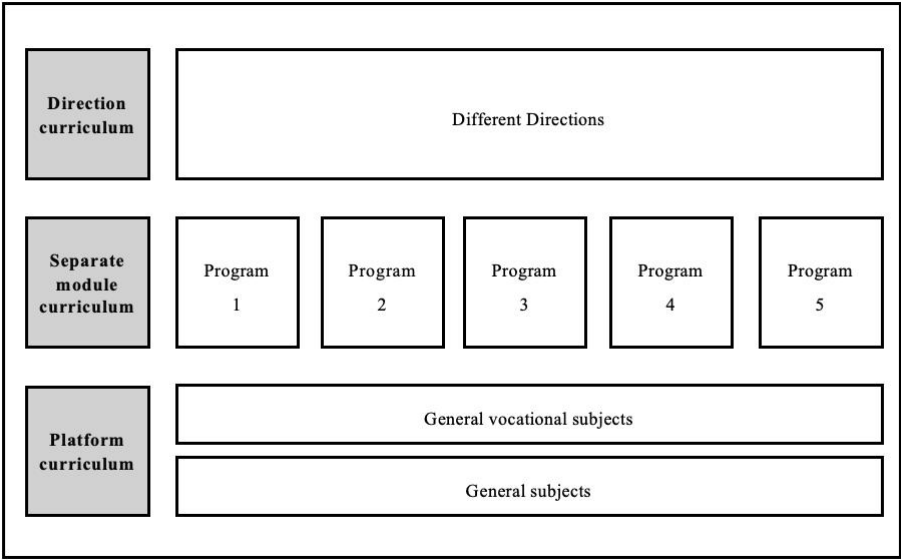


Figure 2. The "separate module" curriculum framework of program cluster.

enterprises. This allows regional economic priorities to be embedded in the curriculum, ensuring a direct response to the development of local industry.

The structure is essentially the determination of the proportion and distribution of various programs in the cluster. Since the program cluster is generally composed of programs with similar occupation or technical fields, therefore it needs to be considered in the curriculum. Higher vocational colleges mainly adopt the framework of "platform + module + direction", with the "platform" ensuring the basic specifications and common requirements for the comprehensive development of the program cluster, reflecting the common theoretical, technical, and skill foundations of all programs within the cluster. The "module" is used to achieve the cultivation of talents in various programs within the cluster, with each module centered around the necessary and sufficient theories and skills for a specific task or work process. The "direction" is aimed at the ability to transition careers, providing students with the option to choose their areas of study based on personal interests and career planning.

Three new types of curriculum frameworks

Due to the different links of the industrial chain that program clusters served, the curricula will also present different structures. Thus forming three types of "platform+module+direction" curriculum frameworks. The specific differences lie in whether the modules are integrated, separate, or mixed.

Module integration

These program clusters serve a relatively concentrated and complete industrial chain. As the industrial chain is

not particularly long, the gap between programs is not large, and there is a lot of common content among the programs, this enables the integration of the module curriculum.

Module separate

These program clusters serve a relatively scattered complete industrial chain. Due to the fact that upstream and downstream may be completely different fields, as reflected in the VET programs and curriculum, it is difficult for schools to integrate the content between different specialties, therefore, the modules can only keep separate (Figure 2).

Module mixed

This type of program clusters primarily serves the midstream and downstream of the industrial chain, facing diverse downstream application scenarios with a common technical foundation. Therefore, the programs within the program cluster can share a common content while also need to highlight scenario-specific characteristics, this ultimately results in a mixed module curriculum that is both integrated and separate. Moreover, these program clusters often emphasize digitalization transformation, incorporating a program that supports this transformation, but this program usually has significant differences from the others, which will also increase the separation of the module curriculum.

CONCLUSION

Overall, by adopting different curriculum frameworks, higher vocational colleges can transform the existing narrow talent cultivation model focused solely on

occupation positions and enhance the adaptability and dynamic adjustment capabilities of programs to align with industrial development. However, at the same time, we have also noticed that these curriculum frameworks still have some limitations, such as the boundaries between different programs have not been dissolved, and it is difficult to integrate curricula between different programs. For this reason, we will continue to pay attention to the implementation of the second round of "Double-High Plan", participate in the adjustment of program clusters in higher vocational colleges, and explore more optimized curriculum frameworks.

DECLARATIONS

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Author contributions

Pan HS: Conceptualization, Investigation, Resources, Writing—Original draft, Writing—Review and Editing. Yang Y: Data curation, Writing—Original draft, Writing—Review and Editing. All authors have read and approved the final version of the manuscript.

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Ethical approval

Not applicable.

Informed consent

The vocational colleges were informed that the first-hand information were only used for research purposes, and their information would be anonymized when presenting the research result.

Conflict of interest

The authors have no conflicts of interest to declare.

Data availability statement

No additional data.

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