

# Digital transformation of vocational education in the Guangdong–Hong Kong–Macao Greater Bay Area: a comparative study

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**Abstract:** The digital transformation of vocational education is an important way to improve the quality of education, optimize educational resources, cultivate innovation ability, realize educational fairness, meet social needs, and reduce the costs of education. This study comparatively analyzed such transformation in the contexts of Guangdong, Hong Kong, and Macao. The results showed that these regions have differences in the manner by which they digitally transform vocational education. This research formulated relevant suggestions for implementation at the macro and micro levels, thus serving as reference for the digital transformation of vocational education in the Greater Bay Area.

**Key words:** digital transformation; vocational education; Guangdong, Hong Kong and Macao; implementation

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## 1 Introduction

In the Guangdong-Hong Kong-Macao Greater Bay Area, vocational education plays a vital role in economic development. The problem in this area is that the advent of the digital age has confronted vocational education with a number of challenges and requirements. Against this backdrop, the traditional model of vocational education faces difficulties in satisfying the growing demand for skills and dealing with the changing industrial structures. The rapid development and wide application of digital technology have brought new opportunities, with digital transformation becoming an inevitable trend in the advancement of vocational education. This transformation can pave the way for more flexible and personalized education methods, improve the quality and efficiency of teaching, and enable the training of high-quality talents for adaptation to the future employment market.

## 2 Comparison of the digital transformation of vocational education in Guangdong, Hong Kong, and Macao

### 2.1 Digital transformation measures in Guangdong

#### 2.1.1 Investment in digital education resources

Digital education resources are vital to the digital transformation of vocational education in Guangdong, which, apart from actively investing in such resources, has built a digital teaching resource bank and a network teaching platform [1], providing rich materials, including courseware, videos, and teaching cases for both teachers and students. The example of

an important achievement in digital transformation is the "Guangdong Distance Vocational Training Platform" launched by the local government of Guangdong. The platform provides a wealth of teaching resources, including teaching videos, textbooks, and exercises. The province has also introduced some well-known online education platforms at home and abroad to provide more learning opportunities for students.

#### 2.1.2 Collaboration with industry

First, Guangdong Province, in partnership with enterprises, has constructed the training bases of Guangdong Robot Industry College and Guangdong Electronic Commerce Industry College. These facilities provide trainees with advanced equipment and technology. Second, Guangdong and enterprises carry out cooperation projects designed to enable industry upgrading and elevate the competitiveness and innovation competence of enterprises. Such collaborative endeavors have also been deployed in the digital transformation of vocational education in the province.

### 2.2 Digital transformation initiatives in Hong Kong

#### 2.2.1 Construction of databases for digital teaching resources

Hong Kong has made remarkable progress in the construction of databases for digital teaching resources. Let us discuss the Hong Kong Education City (HK Ed City) and eClass (online education and teaching) platforms, which provide abundant electronic resources that cover the educational needs of kindergarten to middle school students [2]. These platforms also feature a wide range of content, such as those revolving around classroom teaching design, academic research reports, student homework inspection, teaching reflection, and teacher training. They enable teachers to select resources that are appropriate for learning needs and teaching objectives.

#### 2.2.2 Innovation and application of educational science and technology

The digital transformation of vocational education in Hong Kong has motivated the increased introduction of innovative educational technologies and applications in the city. These scientific and technological tools include VR, augmented reality (AR), and online learning platforms intended to enrich teaching methods and elevate students' learning experience and effectiveness [3]. The innovation and application of educational science and technology are critical components of digital transformation, and they are key to improving the quality and outcomes of teaching.

### 2.3 Digital transformation initiatives in Macao

#### 2.3.1 Construction of educational informatization platforms

The first step in the digital transformation of Macao's vocational education is the establishment of comprehensive digital teaching platforms, which not only provide online courses and video teaching materials but also enable learners to study anywhere at any time. Through the digital teaching platforms, students can access course information, grades, and credits online, while teachers can publish homework and exam arrangements, parents can be apprised of their children's learning situations in real time, thus satisfying requirements related to distance education.

#### 2.3.2 Establishment of certification platforms and systems

With the rapid development of the social economy and the constant change in occupational demands, improving students' vocational skills has become a critical task in vocational education. The Macao Vocational Education Department has established platforms for the issuance of vocational skills certifications. By taking relevant certification examinations on vocational competencies, students can obtain corresponding certificates and qualifications, thereby enhancing their employment competitiveness.

## **3 Comparative study results and findings**

The differences manifest primarily in the following aspects: In terms of investment, Guangdong ranks first in allocating funding to digital transformation and digital education projects. The same is true for Hong Kong, which also

pays attention to cultivating students' innovative and practical abilities. By contrast, Macao has invested less in such transformation, with projects that relatively lag behind those implemented in the two other regions. With regard to industry collaboration, Guangdong and Hong Kong advocate for cooperation between the vocational education sector and enterprises to provide students with practical vocational skills training and improve students' comprehensive skills. Macao pursues collaboration to a relatively lower degree. As for educational resources and technology application, Guangdong has deployed large-scale initiatives in this respect, with the province inclined to adopt universal, extensive, and systematic endeavors to achieve the efficient allocation of educational resources. In contrast, vocational education in Hong Kong and Macao centers more on the quality of education and the innovative application of technology.

#### **4 Recommendations for the digital transformation of vocational education in Guangdong, Hong Kong, and Macao and beyond**

##### 4.1 Macro level: policy guidance on jointly promoting digital transformation

###### 4.1.1 Strengthening policy support and guidance

Strengthening policy support and cooperation is an important aspect of digital transformation. Policy support and guidance can provide necessary resources and environments for digital transformation and promote its smooth progress. For the digital transformation of vocational education in Guangdong, Hong Kong, and Macao, these governments have formulated a series of relevant policies that mandate the provision of financial support; the promotion of comprehensive cooperation between industry, university and research institutes; and the encouragement of innovation and entrepreneurship [4].

##### 4.2 Micro level: synchronization between teachers to improve the quality and effectiveness of vocational education

###### 4.2.1 Strengthening teacher training and development

Because the rapid development of educational technology has meant the increased use of digital tools in instruction, teachers should solidify their professional knowledge and ensure the robustness of their technological skills, including how to use multimedia teaching software, how to employ networks in delivering long-distance education, and how to effectively apply mobile technology in teaching. Teacher training should be strengthened as an important part of education reform.

#### **5 Conclusion**

Guangdong, Hong Kong, and Macao are at the forefront of promoting the digital transformation of vocational education. Their efforts reflect the latest trends underlying global digital education. There are differences in levels of economic development and allocations of educational resources in various regions. Guangdong, Hong Kong, and Macao should further promote the joint development of vocational education and make full use of the advantages of digital technology. The training, openness, and employment-oriented nature of vocational education are expected to advance exceptional and effective vocational education and enable stakeholders to better serve the overall development of the Greater Bay Area.

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### **Conflicts of interest**

The author declares no conflicts of interest regarding the publication of this paper.

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