Investigating The Determinants of Vocational Education and Economic Development in Digital Age: A Review from 2018 - 2023

Li wei¹, Janice L. H. Nga² and Imran A. Shahzad³

Abstract

Vocational education plays a crucial role in the development of individuals by providing them with the most essential skills. The crucial importance of vocational education necessitates support from various elements, including government policy and the educational aspect within the vocational school. However, higher vocational education and economic development in the digital age face several challenges, stemming from enrollment trends, policy interventions, labor market dynamics, and demographic shifts. This study provides a systematic review using PRISMA guidelines for addressing higher vocational education enrollment, policy interventions, labor market trends, and demographic factors that affect the integration of vocational education and economic development in the digital age. The initial phase involves the identification of a suitable source database, which may include prominent platforms such as Scopus, Google Scholar, or IEEE Xplore. The findings of the study reveal that most students enrolling in higher vocational education recommend using hands-on training and practical skills that have been directly applicable to their current job in the IT industry. The program needs to focus on industry-relevant skills for the demands of the labor market. We also identifying and filling these research gaps could lead to a more comprehensive and critical understanding of vocational education. Vocational education programs can adapt to labor market trends by incorporating emerging technologies into their curricula, collaborating with industry experts to identify skill gaps, and offering continuing education courses to keep graduates up to date with the latest advancements. Finally, this study provides some recommendations for further studies.

Keywords: Vocational Education Enrollment, Policy Interventions, Labor Market Trends, Demographic Factors, Economic Development, Digital Age.

INTRODUCTION

Vocational education consists of coursework designed to prepare students for careers as technicians, tradespeople, or artisans specializing in particular trades. Also, it can refer to the type of education provided to individuals to equip them with the necessary skills to secure employment or become self-employed. Vocational education and training are a teaching strategy that places a strong emphasis on the demands of business to facilitate individual growth and development within the sector (Sugiyo et al., 2020). For example, the development of vocational education in China has undergone significant changes over time. The origins of this can be traced back to the 1860s when industrial and commercial education was initially introduced. The historical period can be divided into two halves based on the Westernization Movement. Following China's loss in the Opium War in 1840, the Qing leadership and some patriotic individuals contemplated the nation's inadequate military and economic technology. They made a commitment to actively incorporate advanced Western technology. Consequently, the construction of military industries placed a growing emphasis on the need for technicians and workers possessing advanced technological expertise (Tian, 2023).

Economic development and vocational education are strongly connected. Development and expansion of the economy depend on having a workforce that is educated and skilled. Vocational education equips people with the abilities and information required to succeed in their chosen fields of work when they enter the workforce. In addition to helping the individual, this also advances the expansion and improvement of the economy at large (Pambudi & Harjanto, 2020). Individuals can reap numerous advantages from vocational education. It offers possibilities for career advancement and job market preparedness. Compared to those without vocational education, those with a vocational education completion certificate have a higher employment and wage
probability. Where people can acquire the knowledge and skills that employers highly value in the workforce through vocational education. Additionally, career advancement opportunities are offered by vocational education. Vocational education graduates can advance in their careers and assume higher-level, more lucrative positions (Choi et al., 2019).

The development of technical and vocational education in China has undergone a lengthy and challenging process. There are some factors that influence vocational educational and economic development, such as policy intervention, labor market trends, and demographic factors. The history of technical and vocational education in China dates back over 150 years, starting from the introduction of industrial and commercial education in the 1860s. However, due to the traditional belief that "achieving high-quality education guarantees a respectable profession" and the lack of progress in contemporary industries in China, the advancement of technical and vocational education has been hindered. For example, vocational education and development experienced significant obstacles during the "Cultural Revolution." This was due to a reduction in the secondary school period from six to four years, which led to a substantial increase in the number of students attending high school (Wu & Ye, 2018).

However, certain limitations exist based on the vocational education and economic development in China. For instance, some recent study's conclusions are limited by their focus on a broad concept such as "good character" and lack of empirical data, despite the fact they highlight the positive potential of vocational education. It is challenging to gauge the true effect of vocational education on these facets of human development in the absence of hard data and a precise definition of character development. To fully validate the claims made in this conceptual study, more research utilizing data and context-specific analysis would be required. Additionally, missing contents include policy and implementation, and school-level factors.

The purpose of this review is to investigate the higher vocational education enrollment, policy interventions, labor market trends, and demographic factors that affect the integration of vocational education and economic development in the digital age. Moreover, this study proposes various solutions to address the current challenges in vocational education in China, considering policy interventions, labor market trends, and demographic factors. These recommendations will have significant implications for the future of education in the country.

**METHODS**

This section provides a description of the used review methodology. The standard guidelines proposed by Kitchenham and Charters (Keele, 2007) were utilized. The literature review was conducted by utilizing a pertinent database, employing a search strategy that was devised to identify studies that are relevant to the research topic. Figure 2 illustrates the review flowchart that outlines the data collection process. The diagram below depicts the process of gathering data for a review paper on the integration of vocational education and economic development in the digital age, with an emphasis on higher vocational education enrollment, policy interventions, labor market trends, and demographic factors.

The initial phase involves the identification of a suitable source database, which may include prominent platforms such as Scopus, Google Scholar, or IEEE Xplore. Subsequently, the researcher proceeds to conduct a database search utilizing keywords that are pertinent to the subject matter of the review paper, including but not limited to "vocational education," "economic development," "digital age," "policy intervention," and "demographic factors."
The retrieved search results are subsequently filtered to ascertain the presence of pertinent academic articles. The researcher has the option to review the titles and abstracts of the papers to ascertain their relevance. Additionally, the researcher may choose to peruse the complete texts of select papers to gain a more comprehensive understanding of their content. After the identification of the pertinent literature, it becomes imperative for the researcher to undertake a rigorous evaluation of the selected papers. This process entails evaluating the research's calibre, the soundness of the findings, and the pertinence of the findings to the subject matter of the review article. Ultimately, the researcher must amalgamate the data extracted from pertinent scholarly articles to produce a cohesive and enlightening review paper. This process may entail the identification of prominent themes, the comparison and contrast of various findings, and the formulation of conclusions regarding the present state of knowledge pertaining to the subject matter.

RESULTS

This section contains the results of the SCOPUS database search. As illustrated in Figure 3. Search results from 2018 to 2023, the line graph in the attached image shows the number of documents published on the topic of vocational education and economic development in the digital age. The graph shows a steady increase in the number of documents published on this topic, with the highest total of 40 published in 2020. This trend indicates that researchers and policymakers are becoming more interested in this topic. This interest is most likely due to the growing importance of vocational education in the digital economy. The digital economy is
rapidly changing, and new jobs are being created all the time. Vocational education can assist people in developing the skills required for success in these new jobs. Furthermore, vocational education can help to close the skills gap in the labor force.

Figure 3. Search criteria by year

Figure 4 shows a line graph depicting the number of documents published on the topic of higher vocational education and economic development in the digital age between 2018 and 2023. The search produced documents from a variety of sources, including journals, conference proceedings, and book chapters. The steady increase in the number of documents published on this topic indicates a growing interest in the integration of higher vocational education and economic development in the digital age. This enthusiasm is most likely a result of the growing importance of higher vocational education in the digital economy.

Figure 4. Search criteria by year source

Based on a SCOPUS database search, Figure 5 depicts the distribution of documents published on the topic of higher vocational education and economic development in the digital age by country of origin. The following countries have the most publications: The dominance of China and the Russian Federation in terms of the number of publications on this topic is unsurprising given their large economies and significant investments in higher vocational education. The US, Indonesia, and the UK are also significant players in the global higher vocational education market. The inclusion of Australia, Germany, India, Romania, and South Africa in the top ten indicates that higher vocational education is becoming increasingly important in a diverse range of countries, regardless of economic development level.
Additionally, based on a SCOPUS database search, Figure 6 depicts the distribution of documents published on the topic of higher vocational education and economic development in the digital age by subject area. It is not surprising that business, management, and accounting have dominated the number of publications on this topic. These higher vocational education programs are intended to prepare students for careers in the private sector, which is a major driver of economic development in the digital age. The inclusion of social sciences, engineering, computer science, and education among the top five subject areas indicates that higher vocational education is also important in other sectors of the economy. Higher vocational education programs in engineering and computer science, for example, can help students prepare for careers in the digital economy. Education higher vocational education programs can help prepare teachers for the challenges of teaching in the digital age.

**DISCUSSION**

Many researchers from various fields have investigated based on vocational Education and educational development from 2018 – 2023. Despite shedding light on various aspects of vocational education, the information available paints a skewed picture. While historical development, international best practices, and specific initiatives like WITED provide useful context, a critical discussion necessitates a more comprehensive
Another notable gap is the lack of data on the effectiveness of various vocational education structures in achieving stated goals, particularly those related to job market integration and social mobility. Analyzing success rates across various models and contexts is critical for evidence-based improvement. Comparing the effectiveness of apprenticeship programs in different countries (Carruthers & Jepsen, 2020) or comparing the outcomes of WITED to other scholarship programs for women in TVET (Najoli, 2019) could provide useful insights.

Furthermore, a focus on demographic similarities and ICT skills among students overlooks the nuanced diversity of experiences and needs within vocational education. Gender, socioeconomic background, and learning styles research could uncover underlying inequalities and inform inclusive curriculum design and support systems. According to McGrath et al. (2020), understanding diverse perspectives on education and employment is important because it can be used to identify and address specific challenges faced by marginalized groups in vocational education. The study does not address the theoretical foundations of vocational education. While it refers to opposing educational ideologies, it avoids delving into the cognitive processes and social constructs that shape career choices and societal perceptions of vocational skills. Examining these frameworks may lead to a better understanding of motivational factors, social stigma, and systemic biases. Understanding the cognitive processes involved in vocational skill acquisition, for example (Ramadan et al., 2018), or analyzing the social construction of "skilled" and "unskilled" labor (Gericke et al., 2018), could help to dismantle biased societal views about vocational education.

Identifying and filling these research gaps could lead to a more comprehensive and critical understanding of vocational education. By examining the efficacy of various models, accounting for student diversity, and investigating theoretical frameworks, we can go beyond fragmented insights and strive toward creating a genuinely equitable and significant vocational education system for the twenty-first century. The table provides a summary of related links between vocational education and economic development from state of art studies.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Yeah</th>
<th>Method used</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Kaya, 2018)</td>
<td>2018</td>
<td>Qualitative</td>
<td>The study investigates the correlation between demographic variables, vocational rehabilitation services, and employment outcomes among young individuals with intellectual disabilities.</td>
</tr>
<tr>
<td>(Dengler &amp; Matthes, 2018)</td>
<td>2018</td>
<td>Qualitative</td>
<td>The authors examined vocational education, which is informed by international best practices, and aims to provide training to develop highly skilled and competitive individuals for the labor markets. To enhance the vocational education system, further efforts are required.</td>
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<tr>
<td>(Najoli, 2019)</td>
<td>2019</td>
<td>Qualitative and Quantitative (questionnaire and structured interview)</td>
<td>The study enhances the accessibility of women to technical education. The analysis focused on evaluating the efficacy of the WITED program in promoting the participation of women in Technical and Vocational Education and Training (TVET).</td>
</tr>
<tr>
<td>(Kovalchuk &amp; Shehuiko, 2019)</td>
<td>2019</td>
<td>Qualitative</td>
<td>To underscore the matter of integrating digital technologies into the instructional preparation of vocational education instructors as a contemporary approach to revitalizing vocational education.</td>
</tr>
<tr>
<td>(Carruthers &amp; Jepsen, 2020)</td>
<td>2020</td>
<td>Qualitative</td>
<td>The authors examine the historical development of vocational education, starting from the conflicting educational philosophies that emerged in the 20th century, and subsequently explore the diverse structures that vocational education has taken on in different parts of the world in the 21st century.</td>
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<tr>
<td>(Sanchez-Prieto et al., 2020)</td>
<td>2020</td>
<td>Quantitative (questionnaire)</td>
<td>The study aims to assess the digital proficiency of Dual Vocational Education and Training (DVET) teachers and examine whether age plays a significant role in influencing their level of digital skills.</td>
</tr>
<tr>
<td>(Avis, 2021)</td>
<td>2021</td>
<td>Qualitative</td>
<td>The study demands an additional series of policy interventions aimed at mitigating the disruptions that arise from the rapid pace of change associated with the Fourth Industrial Revolution.</td>
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The study demonstrates how the intentional implementation of international development ideas in Chile was influenced by the ideological orientation of national government administrations during different historical periods. Additionally, it demonstrates the evolution of the primary objectives of VET policies in response to the increasing tertiary sector of the economy and the rising demand for education among lower socioeconomic groups.

The study examines the correlation between vocational education and social and economic development, elucidating their intrinsic connection. It subsequently proposes strategies for vocational education to align with social and economic progress.

The advancement of information technology, encompassing artificial intelligence, big data, cloud platforms, and intelligent terminals, has provided a fresh boost to the reform and development of vocational education teaching. This is happening in the context of "Internet + education" and the seamless integration of education teaching with emerging technologies, which has now reached a higher stage. As a result, education is experiencing continuous innovation and improvement.

This study indicated that government policies also play a crucial role in shaping the effectiveness of vocational education. According to the OECD (2019), government policies may not adequately support vocational education institutions and their efforts to adapt to the changing demands of the digital economy.

This study revolves around vocational schools and colleges that specialize in the fields of engineering and healthcare.

LIMITATIONS

This review research may be limited by the availability of data on vocational education enrollment, labor market trends, and demographic factors across different countries and regions. Additionally, the study was limited to a time frame from 2018 – 2023.

CONCLUSIONS AND FEATURES DIRECTIONS

In conclusion, this study provides a review to investigate the higher vocational education enrollment, policy interventions, labor market trends, and demographic factors that affect the integration of vocational education and economic development in the digital age. However, the integration of vocational education and economic development in the digital age requires a multi-pronged approach that encompasses policy interventions, industry collaboration, curriculum adaptation, and demographic considerations. Finally, by addressing these factors, vocational education can effectively prepare graduates for the demands of the evolving labor market and contribute to a skilled workforce that drives economic growth and innovation.

The feature directions include enhancing policy interventions for vocational education by governments should implement targeted policy measures to support vocational education institutions, incentivize industry collaboration, and promote vocational education as a viable career path. This could include increased funding for vocational programs aligned with labor market needs, tax incentives for companies that invest in vocational training, and public awareness campaigns highlighting the benefits of vocational education. In addition, vocational programs to labor market trends programs should be continuously updated to reflect the evolving demands of the digital economy. Finally, addressing demographic factors and skills shortages should tailor their programs to address demographic shifts and target skill shortages in high-demand industries.

REFERENCES


