Education Economics: Evaluating Policies to Reduce the Skill Gap and Improve Educational Outcomes

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Abstract. This paper examines the role of education economics in addressing the skill gap and improving educational outcomes. Despite significant investments in education by governments and households, a gap persists between graduates' skills and those required by the labour market. The study underscores the need for educational policies that align with economic goals to enhance productivity and reduce unemployment. One of the critical areas of focus includes curriculum reform, which is highlighted as a vital tool for updating educational content to reflect the modern economy's evolving needs better; this includes integrating digital skills, critical thinking, problem-solving, and socio-emotional competencies into the curriculum to prepare students for 21st-century challenges. Another aspect of educational policies, as highlighted, includes vocational training, teacher development, and the challenges in effectively implementing these systems. The findings highlight that targeted policies emphasising practical skills and sustained teacher support can help close the skills gap and promote economic growth.

Keywords: Education Economics; Policy; Skill Gap; Educational Outcome; Curriculum Reform.

INTRODUCTION

One of the fundamental roles of education is the inculcation of relevant skills into graduates that enable them to meet the demands of their employers, which in turn could translate to national economic development. However, current studies have observed the widening gap between the skills employers need and the actual skills employees possess [1]. Despite efforts to reduce the existing gap, the issue persists; thus, educational outcome remains a concern. To buttress the reality of this issue, a survey conducted by Whittaker in 2016 showcased that over 8.3 million people were actively searching for jobs in the United States as of July 2015, while during the same period, there were over 5.4 million job openings which indicate that employers have a job opening and are unable to find qualified candidates to fill these positions [1]. Despite available openings, the prevalence of job seekers highlights a mismatch between the skills and training individuals possess and those required to fill existing vacancies.

The disparity in access to quality education may be seen as one of the challenges that has widened the gap in skills, which is a problem that affects both the developed and developing nations of the world. However, the quality of educational systems, uneven resource allocation, and varying teacher effectiveness in developing countries have massively impacted these nations, enhancing the persistent and growing gap in academic outcomes [2]. Education economics, as a field, offers a robust framework for understanding how different policies can address these challenges, reduce skill inequality, and enhance human capital formation.

Education economics represents a branch of economics that focuses on the role of economic factors on educational systems and how, in turn, education affects economic growth. As such, it is often regarded as an intersection between education and economics [3]. This branch of economics can play a crucial role in reducing skill, considering that the world is experiencing rapid advancement in science and technology, which has further increased the skill gap with educational outcomes not meeting the needs of the growing economic market. The setback of workers not possessing skills that align with the demands of the labour market would lead to a detrimental financial impact that would unavoidably increase

unemployment and underemployment. Governments and institutions can address the skill gap, boost productivity, and create a more inclusive and equitable society by investing in education systems and aligning them with economic goals. Therefore, the current study delves into education economics and its role in reducing the skill gap and improving educational outcomes.

Literature review

Education policy could prove to be a pivotal tool towards bridging the skill gap that enables educational institutions to develop skills within graduates to prepare them to navigate the fast-evolving world due to digitalisation. The author [1] noted the reality of the skill gap, particularly in the United States of America and some of the measures taken to reduce the gap. The author stated the growing demands of IT professionals while considering that the world is currently at a point of rapid digitalisation. One initiative the White House took in 2009 was to launch a program to train new teachers in science, technology, engineering, and math (STEM) by 2019, with seven hundred million dollars budgeted for this purpose. Despite the US government's efforts, the demand for IT professionals is still unmet. Author [1] further noted that most heads of business and chief executive officers (CEOs) in America are calling on the government to take necessary steps to develop a skilled workforce as the skill gap challenge is impacting the growth of businesses. Addressing the skill gap has become a critical priority for policymakers worldwide, leading to the development of various educational reforms and interventions aimed at improving the quality and accessibility of education.

Educational curriculum reform has emerged as one of the most helpful tools in combating skill gaps, with several nations' Governments taking necessary steps to reform the education curriculum to reflect the world's reality of a fast-changing world by imputing various cognitive and socio-emotional skills [4]. However, there is significant variation in how several countries have been able to incorporate skills vital in the 21st century into their curriculum [5-7]. Some of the 21st-century skills, as highlighted by authors [8], encompass skills that include digital skills (e.g., computational thinking, programming and robotics), advanced cognitive skills (e.g., critical thinking and problem-solving), executive function skills (e.g., self-regulation and metacognition, which interact dynamically with cognitive skills), and socioemotional skills (e.g., self-esteem, perseverance, and empathy). In the Information age, the importance of digital skills is rapidly growing, driving the need for individuals to adapt and acquire relevant expertise to thrive in the 21st century. Although there is broad agreement and commitment to incorporating both the teaching and learning of 21st-century skills into the curriculum, many countries have faced challenges in integrating them into their curricula. A study found that while approximately 86% of 113 countries acknowledged 21st-century skills in their national education policies, only a few outlined concrete plans for incorporating these skills at policy and practice levels [6, 7]. Some of the world's developed nations have taken necessary steps in implementing positive reforms in their educational institutions that align with the current market demand and have significantly noticed positive uptrends in their economic development. Educational institutions centre some of these reforms on how students are taught. Countries like New Zealand, Norway, Germany, and Austria integrate two years of practical experience in school settings as part of teacher career training. Teachers in Japan and South Korea have strong support, emotional training, and high societal recognition and status for the teaching profession [8].

The literature review conclusively emphasises the crucial role of educational policies in bridging the skills gap and improving student and economic outcomes. Countries like Finland and Japan, which have modernised their education systems, highlight the importance of aligning curriculum reforms with the needs of the labour market. Critical approaches include incorporating 21st-century skills, strengthening vocational training, and providing ongoing teacher support. Although the skills gap is widely recognised, many nations face challenges in implementing these reforms. A comprehensive strategy that integrates policy reform, practical skill development, and teacher support is essential in building a workforce capable of adapting to changing economic demands, promoting sustained growth and societal progress.

RESULTS AND DISCUSSION

Global Curriculum Reforms. The skill gap issue is intensifying, with some scholars associating it with failure in the education system [9]. The cur-

riculum serves as the primary tool for educational systems to develop human capital that meets the demands of society in terms of specific knowledge, competencies, and skills. In other words, the curriculum showcases the standard that students should imbibe to make meaningful contributions to themselves and their community at large [8]. Authors [10], as cited in authors [8], "further define curriculum as including aspects such as teaching methodology, class size, learning hours allocation, learning objectives, assessment, and examination practices. A curriculum reflects a social and political agreement as it decides what knowledge and skills are valuable and worth passing on to current and future generations". It is, therefore, crucial and essential in addressing the skill gap challenge as the world is evolving rapidly; this is obvious in the 21st century, as the educational system is changing from a knowledge base to a competency-based curriculum, which should prove vital in developing competent graduates with the skills to make necessary contributions to an organisation or company [11].

Countries must focus on more than developing specific technical knowledge and skills to equip graduates for an ever-evolving and dynamic future. Individuals must utilise every opportunity for lifelong learning and skill development [12]. In response to constantly shifting realities and market demands, education must enable people to understand better and adapt to these continuously changing circumstances [8, 13], which is in line with the author's [13] view of a paradigm shift in market demand, shifts in educational objectives may therefore drive curriculum reforms, the need to address social, economic, and technological changes, as well as concerns over the effectiveness of current education system [14, 15].

Finland is one of the countries known for the role of curriculum reform in enhancing the quality of their education outcome [16]. Some of the steps the Finnish government took were programs that improved the colouration of education stakeholders at all levels in Finland, considering that the Finnish education system is decentralised, with teachers given autonomy in the curriculum design. Developing and implementing the core curriculum and the teacher education development program has facilitated advancing teaching and learning of 21st-century competencies [16]. The central aim of the core curriculum is to enhance key competencies such as critical thinking, problem-solving, collaboration, and communication while also taking note of the primary goal of this reform, which is to prepare students for the complexities of the modern world by fostering skills that are relevant across various contexts [16].

Japan's education system is another instance of a nation that has taken necessary steps in the last 40 years to transition its education system from the 20th-century model into the 21st-century model to meet the demands of the ever-changing world. These reforms have yielded remarkable success as the Organisation for Economic Cooperation and Development (OECD) in 2018 noted that Japan's education system ranks among the highest in performance for youth and adults compared to other nations [17]. This assessment was based on the OECD's "Programme for International Student Assessment" (PISA), with the Japanese students consistently achieving top scores in science, mathematics, and reading literacy [18]. The curriculum in Japan was carefully designed to enhance creative learning, blending both classroom and hands-on-based learning and using ICT to provide quality education at a low cost. The country invested in teacher training and initial education to enhance their ability to adapt to the revised curriculum [18]. The components of varying nation's curricula are summarised below.

Table 1 – Summary of some nation's curriculum components [8]

Nation	Curriculum component
Germany	The curriculum outlines specific competencies for each subject and includes achievement indicators. It also incorporates teaching methods tailored to various learning levels and paces.
Australia	The curriculum hinges on seven core skills: ethical awareness, personal and social development, intercultural understanding, critical and creative thinking, technology, communication, literacy, and numeracy.
Austria	The curriculum outlines a set of practical skills focusing on individual development (including social and personal skills, literacy, health education, and language learning), group-related skills (such as political education, debate, gender equality, and career guidance), and

Nation	Curriculum component
	environmental and technological competencies, all with a strong emphasis on life skills.
Belgium	The curriculum varies by community. The Flemish community emphasises critical thinking. Those in the Walloon community uphold principles such as differentiated teaching methods, continuity in learning, cognitive processes, formative assessment, and learning strategies. Meanwhile, the German-speaking community curriculum is based on enhancing student responsibility.
Canada	The curriculum highlights personalised learning, global openness through classroom and experiential learning, and subject-specific skills.
South Korea	Rooted in The Character Education Promotion Act, the curriculum aims to cultivate a mindset conducive to living harmoniously with others and nature. It promotes 21st-century skills, including problem-solving, information and communications technology, sustainability, English proficiency, and social skills.
Denmark	The curriculum fosters the development of competent, critical, and participatory citizens. It emphasises student cooperation and debate, including four cross-cutting approaches: linguistic development, entrepreneurship, technology and media, and innovation, informed by the "United Nations Sustainable Development Goals" (SDGs).
United State	The curriculum focuses on social-emotional learning (SEL), detailing five competencies: proper decision-making, self-management, social awareness, relationship skills, self-awareness, and 21st-century skills such as communication, collaboration, information management, innovation and creativity.
Scotland	The Curriculum reform was carried out in 2019. It's known as "Curriculum for Excellence", which places focus on four capacities which are inclusive of confident individuals, responsible citizens, successful learners, and effective contributors, taking into consideration four aspects: interdisciplinary learning, school ethos, curriculum areas and subjects, as well as opportunities for personal achievement.
Slovenia	It aims to enhance learning abilities, sustainable practices, human rights education, and communication skills, emphasising outdoor education.
Spain	The curriculum aligns with the European Reference Framework, featuring eight key competencies and significant regional diversity. The new law (LOMLOE) emphasises skill acquisition and establishes a graduation profile linked to attitudinal, instrumental, and cognitive dimensions, with a commitment to the SDGs.
Finland	The curriculum focuses on topics chosen based on student interests, involving their participation, and prioritises transversal and digital competencies within rich, personalised learning environments.
Netherlands	Educators categorise competencies into thinking, acting, self-awareness, and interpersonal relations.
Japan	The national curriculum standards consist of three pillars: critical thinking, motivation to learn, and a sense of humanity, promoting 21st-century skills through language and science education.
Singapore	The curriculum is structured in concentric rings, with core values at the centre and 21st-century competencies in the outer ring. Core values emphasise social and emotional skills, while the outer ring focuses on essential modern competencies such as critical and creative thinking, global awareness, civic literacy, collaboration, intercultural skills, communication, and information skills.
New Zealand	Teachers have considerable flexibility in curriculum decisions, emphasising five key competencies: thinking, symbolic and linguistic use, self-management, interpersonal relationships, and participation.
Portugal	The curriculum mandates the development of various skills, including physical knowledge, text interpretation, well-being, interpersonal relationships, critical and creative thinking, reasoning, scientific and technological knowledge, personal development, and aesthetic sensitivity, emphasising curricular flexibility in organisation, timing, and spaces, and defining competency profiles by educational stage.
Kenya	The 2017 reform introduced a competency-based curriculum shaped by a Needs Assessment Study from the "Kenya Institute of Curriculum Development" (KICD) and aligned with the Basic Education Curriculum Framework (BECF).

Vocational and Technical Education Policy. Vocational and Technical Education (VTE) policies are crucial in addressing and reducing the skills gap between the labour market's needs and the workforce's capabilities. These policies focus on equipping individuals with practical skills and technical knowledge required by industries, thereby helping to align education outcomes with economic demands. Authors [19] noted the shift in education policy to inculcate vocational training that is currently utilised by some prosperous European nations, with this excerpt buttressing this model: "Some European countries already have world-class VET systems (Germany, Austria, Denmark, the Netherlands), with built-in mechanisms to adapt to current and future skills needs, so training is more demand-driven. They report fewer problems with skills mismatches and show better employment rates for young people. In these countries, VET education is characterised by dual systems with a high proportion of work-based learning. Others, typically in Southern Europe, lag in participation, quality, outcomes and attractiveness." [20, pp. 5-6].

Despite the success of dual education in training technical students in Germany, there are still drawbacks to its level of effectiveness, which represents its challenge. Significant challenges in implementing dual vocational training systems include companies' reluctance to offer training positions and the low societal acceptance of vocational education [21]. Therefore, directly replicating such a system in another country is unrealistic. Countries adopting a foreign vocational education and training system must consider their framework conditions and align them with their educational, social, and economic goals. More so, the introduction policies that support internships, apprenticeships, and on-the-job training give students practical experience, helping to ease their transition from education to the workforce.

Policy on Teacher Training and Professional Development. Teachers are pivotal to the success of any reform in the educational setting. Countries generally envision the ideal teacher aligning with 21st-century skills and competencies, demonstrating leadership, social awareness, innovation, communication, emotional intelligence, and an entrepreneurial mindset [8]. These teachers are expected to have strong research abilities, create content, foster a collaborative culture, and promote environmental awareness and sustainability among students; this has led to a growing emphasis on practical teacher training. For instance, New Zealand, Germany, Norway, and Austria offer two years of hands-on, applied training to bridge initial education with professional careers [8].

Regarding societal recognition and financial remuneration, Japan and South Korea offer teachers high status, competitive salaries relative to GDP, and solid emotional recognition. Despite this, teachers in these countries face challenges like depression and low self-esteem, leading to a focus on emotional support throughout their careers [8]. Canada's teacher support program is notable for its comprehensive, career-long approach [8].

Policy implementation. Policy implementation plays a crucial role in ensuring that the objectives of educational reforms translate into meaningful outcomes. It involves the careful execution of strategies, allocation of resources, and coordination between stakeholders, including government agencies, educators, and institutions. According to the Organisation for Economic Cooperation and Development (OECD), over 450 educational reforms were implemented in OECD countries between 2008 and 2014 [22]. Given the rapidly changing economic, social, and demographic conditions influencing education, these efforts to adapt, enhance, and shape the future of education systems seem justified [23].

Despite the efforts by policymakers in developing education policies that align with the demands of the 21st century, several policies frequently fall short in execution or fail to achieve the intended results, thus bearing in to mind the challenge of policy translation into everyday practices for teachers, school leaders, and local communities [23, 24]. Often, the specifics of implementation are left to administrators and educators, leaving the reform incomplete [25]. Author [25] added that policymakers devote time to formulating policy without assessing previous reform.

Some of the challenges that schools may likely face in policy implementation are the limitations in their capacity and resources, such as funding, training, or technology, which threaten the implementation of reforms. The political dynamics of reform consider constraints like limited public budgets and opposition from interest groups, challenges policymakers must overcome to carry out changes [23] successfully. The challenges as-

sociated with implementation set the disparity between developed and developing nations. One of the limitations in policy implementation can be traced to the 6-3-3-4 education reform that was carried out in Nigeria in 1982, with the aim of the education policy to develop the country's vocational education. Yet, this reform has not yielded results due to the lack of funding and the poor budgeting of resources [26]. While policymakers frequently develop comprehensive reforms, the real challenge lies in executing these policies effectively at the institutional level. Overcoming these implementation hurdles demands a concentrated effort on resource allocation, building capacity within schools, and providing ongoing support for educators. Successful policy implementation is crucial for closing the skills gap and ensuring that education systems meet labour market demands, ultimately contributing to long-term economic growth.

The economic implication of education. Education is crucial to a state's economic growth by driving demand for a more skilled workforce and improving labour productivity. It increases economic returns through increased productivity and higher incomes [3]. Additionally, education enhances workplace performance and cognitive abilities. States with robust education systems benefit by increasing the proportion of the workforce and retaining workers for extended periods. A well-structured educational program helps integrate individuals into the global economy and reduces the impact of unemployment, in contrast to states that have not made such investments. Education also contributes to raising living standards and enhancing individual achievements and intelligence [3].

Moreover, education enables the population to benefit from scientific and technological advancements, introducing new products and methods to boost individual income and drive economic development. While the quality and scope of education vary between states, its role as a critical driver of economic growth is undeniable; this stands in contrast to regions where higher levels of education are often associated with more robust economic progress. The disparity arises because what is taught may not always align with the skills and knowledge employers require in the labour market. Economics primarily focuses on the allocation of resources. When distributing capital, the goal is determining how costs can be minimised to achieve the highest possible income or optimal return [3].

Governments in developing countries, international aid agencies, and most economists agree that education is crucial – though not always sufficient – for long-term economic growth and a higher standard of living. These governments collectively invest around one trillion dollars annually in education, with households contributing hundreds of billions more, though the exact figure is hard to determine. However, school enrollment alone does not ensure students gain the expected human capital from their education. Evidence shows that in many developing countries, students often fall short of achieving the goals set by the official curriculum [2].

Education is a long-term investment that brings numerous societal benefits beyond increasing individual incomes. It promotes innovation, strengthens social cohesion, and contributes to political stability, all of which drive the overall development of nations. An educated population is better equipped to engage in democratic processes and make informed decisions, thereby improving governance. Moreover, education is critical in reducing income inequality and poverty, fostering more inclusive economies [2]. However, ensuring equal access to quality education remains a significant challenge, particularly in developing countries, where limited resources and infrastructure can hinder progress. Addressing these issues requires policies that broaden access and enhance education quality to ensure its total economic impact and better align education outcomes with labour market needs.

Education and Human Capital Development. Human capital is a critical factor in economic growth and is essential in shaping economic, social, and employment policies [27]. Human Capital refers to the skills, knowledge, experience, and abilities that individuals acquire through education, training, and life experiences, which enhance their productivity and contribute to economic growth. It is critical in determining a country's economic development, as a well-educated and skilled workforce can drive innovation, efficiency, and overall economic performance [27]. Investments in human capital, such as education, are crucial for improving individual earning potential and societal prosperity. Hanushek and Woessmann [28] noted that education enhances the skills and abilities within the workforce, leading to increased labour productivity and facilitating progress toward a higher, more stable level of economic output.

Most education policies initiated by Millennium Development Goals (MDGs) and UNESCO have focused on Education for All rather than the quality of education. Although these efforts have expanded access, they haven't necessarily led to better economic outcomes [28]; this has significantly impacted human capital development, most notably in developing nations. This impact reduces the deficit in skill gap, as it enhances the skills of individuals. Consequently, public investment in education is generally viewed as beneficial for the economic progress of societies in both the medium and long term [29]. However, various factors must be considered when assessing the "efficiency" of educational spending. Aspects such as teaching quality, academic infrastructure, and curriculum design significantly influence the outcomes of educational investments, meaning that increased spending does not always guarantee improved results [30]. Author [31] found that educational spending can foster economic growth only if the quality of education surpasses a certain level, indicating that enhancing educational quality is essential for making such investments worthwhile.

Education is fundamental to human capital development, which drives economic growth and societal advancement. It provides individuals with the necessary knowledge, skills, and competencies to participate effectively in the workforce, boosting productivity and fostering innovation. Countries prioritising education and adapting their systems to meet the changing demands of the labour market are better equipped to fully leverage their human capital, leading to improved living standards and reduced inequality. To fully realise these benefits, attention must be given to both educational access and quality, ensuring that curricula are aligned with the needs of a rapidly evolving global economy. Investing in education is essential for developing a skilled and flexible workforce that supports national and international progress.

The growing disparity between workforce skills and labour market demands presents a global challenge, particularly in developing countries. While education is crucial for economic progress, current systems often fail to provide graduates with the skills employers require. This study points to the importance of education policies prioritising practical, market-aligned training, especially in digital literacy and vocational education.

Countries like Finland and Japan have successfully modernised their education systems to keep pace with current demands, focusing on lifelong learning and integrating competencies needed for the 21st century. These reforms, including enhanced teacher training and support, have improved student outcomes and workforce readiness. However, the study notes that replicating these models in other nations can be difficult due to differing social, economic, and institutional factors.

The paper also discusses the role of vocational and technical education (VTE) in reducing the skills gap, pointing to the success of dual education systems in Germany and Austria. However, it cautions against directly implementing these systems in other countries without adapting them to local conditions. Teacher training and professional development are also crucial, with nations like Japan and South Korea offering high recognition and support for teachers, contributing to improved educational results and broader societal benefits.

CONCLUSIONS

In conclusion, tackling the skills gap requires thoughtful educational policies that match the needs of the labour market. Reforming curricula, enhancing vocational training, and providing ongoing teacher development are key strategies to ensure graduates have the skills to thrive in a changing economy. The examples of countries like Finland and Japan demonstrate the benefits of incorporating practical skills and lifelong learning into education systems. By adopting similar approaches and customising them to fit local conditions, nations can build a capable workforce that supports long-term economic growth and societal progress. Therefore, the study advocates for a holistic approach to education policy that combines curriculum reform with investment in teachers and practical skills development to meet labour market needs better.

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