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Sustainable Development Goal 4: Does Government Expenditure Contribute Significantly?

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Abstract

Government spending is the amount of money that the public sector spends on the purchase of products and the delivery of services including defence, social protection, healthcare, and education. The present study tries to find out how countries are spending on education to achieve Sustainable Development Goal (SDG) 4. The study analyses government expenditures on education made by selected economies to achieve SDG 4 from 2020 to 2022. The analysis is based on the secondary data collected from the Division for Sustainable Development Goals (DSDG) in the United Nations Department of Economic and Social Affairs (UNDESA) on 1 April 2023. The 10 largest economies have been selected for the analysis. One-way analysis of variance has been used to see the statistical significance difference in expenditure among the countries and for different time periods. The analysis shows that government expenditures as percentage of gross domestic product (GDP) is highest in France and lowest in China, Macao Special Administrative Region. While making comparisons among the selected economies all the countries are significantly different in the expenditure for education. The result also concludes that during the last three years the government expenditure did not change; indeed, it decreased over the period of time. One of the potential reasons could be the COVID-19 pandemic in 2020–22 when governments could not make significant contributions to improve education.

Keywords: SDG 4, Education, Expenditure, Countries

INTRODUCTION

Education is essential for maintaining one's self-respect and liberates the mind and imagination. It is the key to prosperity and opens avenues for all of us to make a positive, progressive contribution to society. Since education benefits everyone, it should be available to everyone. Education in that specific subject helps people think, feel, and act in ways that support their achievement and improve their community and personal satisfaction. A person's personality, thoughts, interpersonal relationships, and preparedness for novel events in life are also shaped by their education. Those who possess it are granted a special place in society. Everyone has the right to education. Before the COVID-19 pandemic, progress towards high-quality education was moving more slowly than was necessary. However, the pandemic had a disastrous effect on education, leading to learning losses. Therefore, there is an urgent need to combat the challenges in quality education.

Sustainable Development Goals

The term Sustainable Development (SD) was first used in the United Nations (UN) Brundtland Report in 1987,

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and it has since evolved into a guiding philosophy that unites issues with social, economic, and environmental development. The most recent version of the global SD agenda, the 2030 Agenda for Sustainable Development, was approved by UN member states and consists of 17 Sustainable Development Goals (SDGs) and 169 related targets.

These high worldwide objectives mark a watershed moment in the extensive history of SD by offering a creative and comprehensive solution to the most pressing problems relating to sustainability and its three ramifications. All countries and industries are accountable for implementing the 2030 Agenda, and both the public and commercial sectors must play an active and significant role in ensuring that the global goals are incorporated into their strategies, business plans, and reporting frameworks. Private firms are anticipated to be the key, promoting productivity, directing inclusive economic growth, and generating employment. And the public sector is viewed as being essential to advancing and pursuing SDGs since it works for the general good of society, fostering welfare, inclusion, and equity.

Given that education has historically been acknowledged as a catalyst for transforming global ideas and values to solve sustainability concerns, several stakeholders have argued that the education sector should take the lead in the transition in this context. As stated in the SDG 4 declaration – to be certain that everyone has access to high-quality, inclusive education and encourage possibilities for lifelong learning.

Consequently, SDG 4 has set the following sub-goals to guarantee inclusive, equitable, high-quality education and encourage opportunities for lifelong learning for everyone.

The sub-goals are as follows:

- *Free Primary and Secondary Education:* Make certain that every boy and girl has access to free, equitable, and excellent primary and secondary education by 2030, resulting in learning results that are applicable and efficient.
- *Equal Access to Pre-Primary Education of High Quality:* Ensure all children have access to high-quality pre-primary education, care, and development by 2030 so that they are prepared for primary schooling.
- *Affordable Technical, Vocational, and Higher Education, Accessible to All:* Ensure equal access to high-quality, cost-effective technical, vocational, and post-secondary education, including universities, for all men and women by the year 2030.
- *Raise the Number of People with Essential Skills for Success:* Increase the percentage of adults and youth with the technical and vocational skills necessary for work, respectable careers, and entrepreneurship by the year 2030.
- *Get Rid of Discrimination in Schools*: Eradicate gender inequalities in education by 2030, and guarantee vulnerable populations, people with disabilities, indigenous peoples, and children in precarious situations equal access to all educational and vocational opportunities.
- *Universal Literacy and Numeracy:* By 2030, ensure that all children and a sizeable portion of adults, both male and female, are skilled in reading and numeracy.
- *Education for Global Citizenship and Sustainable Development*: Make sure that by 2030 every student has the knowledge and abilities necessary to advance sustainable development. Along with teaching them about global citizenship, respect for cultural diversity, and the role that culture plays in promoting sustainable development, this entails teaching them about human rights, gender equality, sustainable lifestyles, and the advancement of a culture of non-violence and peace.
- *Construct and Upgrade Safe and Inclusive Schools:* Restructuring educational amenities that include children's needs, provision for people with disabilities, and women, and that offer a safe, non-violent, welcoming, and productive learning environment for all.
- *Scholarships for Developing Nations:* Increase the number of scholarships offered to developing countries by a large amount by 2020, with a focus on small island developing states, African countries, and the least developed countries. These scholarships can be utilised for information and communications technology, vocational training, technical, engineering, scientific, and post-secondary education programmes in both developed and developing countries.

- *More Qualified Teachers in Developing Countries:* By 2030, there should be a considerable growth in the count of competent teachers available, partly due to international collaboration on teacher development programmes in developing economies, particularly in tiny island developing states and the least developed states. One of the key elements accelerating educational system development, achieving these targets, and raising educational standards is government expenditures.

Optimum Utilisation of Government Expenditures

Government expenditure can significantly enhance the quality of education in several ways.

- *Technology Integration:* By making investments in technology infrastructure, such as computers, internet access, and instructional software, schools can leverage technology to improve the teaching and learning process. This prepares students for the digital world and makes learning more engaging and participatory.
- *Infrastructure Investment:* Buildings for schools, libraries, laboratories, and other amenities can be constructed and maintained with sufficient financing. Modern infrastructure fosters a favourable learning environment, which is necessary for high-quality instruction.
- *Teacher Training and Salary:* Government funds might be devoted to programmes that prepare teachers to teach children in an effective manner by providing them with the skills and information they need. Competitive pay can also help to draw and keep skilled educators, which has a direct effect on the quality of education.
- *Curriculum Development***:** Governments have the authority to allot funds for the creation of contemporary, pertinent curricula that satisfy academic requirements and cater to the demands of a heterogeneous student body. This includes adding the most recent information and trends to textbooks, instructional materials, and other resources.
- *Assistance for Underprivileged Children:* Public funds can be allocated to initiatives that assist underprivileged children, such as free meals, school supply subsidies, and scholarships. Reducing socio-economic barriers to education contributes to ascertaining equitable access to premium quality education for students.
- *Research and Innovation:* Creation of innovative teaching strategies, instructional technologies, and best practices is encouraged by funding for educational research and innovation. This cycle of continuous improvement uses solutions based on empirical research to improve education generally.
- *Special Education Services:* Programmes and services for students with a range of learning difficulties can be supported by adequate government funding for special education. Providing customised instruction, supplying assistive technology, and providing tailored assistance are all part of this to guarantee that each and every student has the chance to achieve academic success.
- *Mechanisms for Quality Assurance:* Governments can monitor and assess the performance of educational institutions by putting in place quality assurance systems including school inspections, standardised testing, and accrediting procedures. This accountability guarantees that resources are used efficiently and that learning objectives are met.

On the surface, education is an undeniable priority for the growth of any economy and an obvious point on any government budget. At the end of the Millennial Development Goal era, it was clear that lack of financing was one of the crucial factors for slowing down the progress of universal elementary education. Therefore, government expenditure plays a crucial role in enhancing the quality of education by providing the necessary resources, support, and infrastructure to foster student learning and development. The present study tries to find how countries are spending on education to achieve SDG 4.

OBJECTIVE

To analyse government expenditure on education made by various countries to achieve the SDG 4 from 2020 to 2022.

LITERATURE REVIEW

Muff et al. (2017)	The 17 SDGs are the cornerstone of the planet's long-term sustainability efforts. These goals specifically address the problems and look for a positive way to resolve them. SDG 4 of the 17 SDGs aims to provide a sustainable education system for everyone on the planet. Seven goals make up this SDG 4, which deals with issues like dropout rates in primary, secondary, and higher education as well as creating opportunities for those who are less fortunate, including members of the scheduled castes, native people, and people with disabilities, among others. In addition, it has three supporting goals that can aid in achieving the seven SDG 4 targets.
Singh et al. (2021)	The Indian government has started a number of initiatives to promote and realise SDG 4. In the current pandemic context, measures such as SWAYAM14 and DIKSHA15, among others, have been demonstrated to be ineffective.
Beena (2019)	Drew attention to India's commitment to providing all children with comprehensive, equitable, and high-quality education by 2030. The Right to Education (RTE) and the Sarva Shiksha Abhiyan (SSA) are two initiatives that have improved India's educational system. However, significant progress has been made towards achieving universal primary education, as evidenced by advancements in enrolment, retention, and other physical infrastructure.
Khan et al. (2022)	The higher education system was given a roadmap for creating alternative funding sources by the proposed Institutional Investor & Sustainable University Funding Governance Code, which will make the system independent, lessen the burden on the government, and create a significant market opportunity for both players. The collaborative strategy for achieving SDG 4 – quality education – may be covered.
Ferguson (2020)	Discussed the importance of higher education in achieving SDG 4, including opportunities and obstacles. This research provides an example that The University of the West Indies (UWI) School of Education (SOE) (Mona Campus in Jamaica) serves as an illustration of how higher education may successfully promote SDG 4. Instead of just following along on the sidelines, the report argues that higher education institutions (HEIs) need to take an active role in forming and directing the SDG 4 agenda. A framework is suggested to help HEIs achieve the results linked to SDG 4. As the need for higher education rises globally, it is hoped that this will help shape debate as well as activities.
Hopp, D., Fu, E., and Peltola, A. (2022)	The 26 Tier 1 indicators and sub-indicators in Goal 4 cover a variety of subjects, such as school resource access, parity indices, and education completion rates. The Open SDG Data Hub, the SDG indicator database, the SDG indicator metadata, United Nations Educational, Scientific and Cultural Organization (UNESCO), and the Institute for Statistics (UIS) were the sources of feasibility information for this target. Out of the 26 indicators, 15 were deemed 'likely', 10 'unlikely', and one was determined to be 'highly likely' appropriate for now casting. The majority of Goal 4 indicators are not widely published at the national or regional levels; nevertheless, data for certain specific countries and regions may have long enough publication histories to be useful for nowcasting. Regional variations exist in the data reporting for the Goal 4 indicators.
Durrani (2023)	Extends the conversation on ensuring and evaluating equitable, high-quality education, focusing specifically on remote learning as a result of the global health crisis. Post-pandemic quality improvement attempts should look at the contextual elements that influence teaching and learning and how different social groups experience them differently. The study finds that having access to the four supportive elements – the home environment, policy guidelines, professional development in digital pedagogy, and digital infrastructure – is beneficial. However, these were hampered by characteristics such as school type, rurality, family income, and family size and type. Making progress towards SDG 4 is essential because its failure could have a significant impact on other linked SDGs. Quality education must be prioritised and funded in order to achieve progress towards all of these SDGs, as SDG 4 can negatively affect levels of poverty (SDG 1), hunger (SDG 2), gender equality (SDG 5), health (SDG 3), economic growth, and the decrease of inequalities (SDG 8).
UNESCO (2022)	The COVID-19 pandemic has resulted in significant fiscal policy gaps and challenges, especially for low- and lower-middle-income countries. In order for Asia and the Pacific area to meet SDG 4 by 2030, government commitments on education investment must be fulfilled. To get the country back on track to reach SDG 4, education spending must be increased from 4% to 6% of gross domestic product (GDP) and from 15% to 20% of total communal spending. Not only do estimates of climate change suffer from the lack of comprehensive, high-quality education data systems in the region, but estimates from other sectors such as labour, industry, agriculture, child protection, health, and nutrition are also negatively impacted.

Ntsiful et al. (2023)	Analysed school libraries at Benkum and Presbyterian only serve as training facilities for educators and students, but in Kwabenya they play a vital role in assisting teaching and learning in the classroom. According to the study's findings, school administration should support the school library by offering training and helping students use the resources at their disposal to enhance their teaching and learning to help them achieve SDG 4. The study made the following recommendations: raising awareness of SDG 4 through workshops, offering training, and improving collecting to aid in students' teaching and learning.
UNESCO (2022)	In the Asia-Pacific region, there is a persistent rise in both educational accessibility and participation. Nonetheless, there are issues with providing high-quality education at all levels. The COVID-19 pandemic exacerbated the region's already-existing learning crisis and deepened inequality by posing a threat to undo the gains made over the previous 10 years. Closing schools due to the pandemic and the poor quality and reach of remote learning resulted in unprecedented amounts of learning loss, necessitating considerable short- and medium-term attention and mitigating efforts. Because of their crucial role in enhancing learning outcomes, teachers require more pedagogical, administrative, and psychosocial training in addition to professional development opportunities and support to enable them to teach in digital and blended learning environments.
Motkuri and Revathi (2023)	Showed that the GDP and total household consumption expenditure (HCE) portion of private school spending is increasing. Income level and per capita private school spending are positively correlated. The share of per capita private education spending in the HCE of the lowest income strata is increasing at a quicker rate. The fraction of the top 10% to the bottom 10% of per capita private education expenditure is high but has been declining over time, indicating that compared with higher economic strata, lower economic strata are devoting a larger portion of their income to education.

METHODOLOGY

Data

The present study analyses government expenditures on education made by selected economies to achieve SDG 4 from 2020 to 2022. The nature of study is descriptive. The analysis is based on secondary source data collected from the Division for Sustainable Development Goals (DSDG) in the United Nations Department of Economic and Social Affairs (UNDESA) on 1 April 2023. The 10 largest economies have been selected for the analysis.

Table 1: Top 10 Economies in the World

Sr. No.	*Country Name*	*Continent*	*Nominal GDP Count (USD)*
1	United States	America	25,035,164
2	China	Asia	18,321,197
3	Japan	Asia	4,300,621
4	Germany	Europe	4,031,149
5	India	Asia	3,468,566
6	United Kingdom	Europe	3,198,470
7	France	Europe	2,778,090
8	Canada	America	2,200,352
9	Russia	Europe	2,133,092
10	Italy	Europe	1,996,934

Source: https://cleartax.in/s/world-gdp-ranking-list

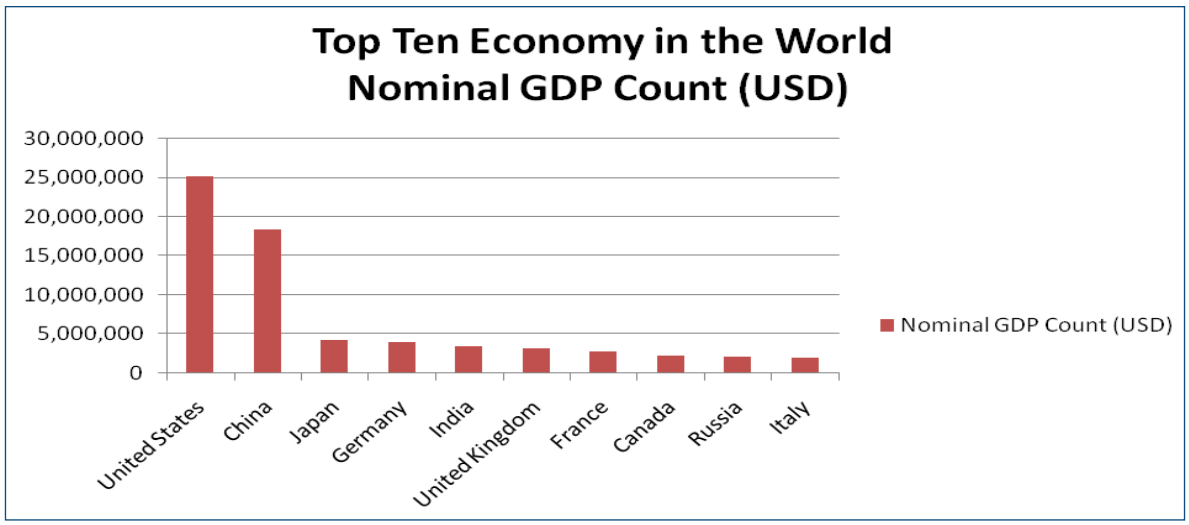

Table 2: SDG 4 March 2023 Release

Government Expenditure on Education as a Percentage of GDP (%)				
Region	*Country*	*2020*	*2021*	*2022*
SDG: Central and Southern Asia	India	4.31	4.38	3.90
SDG: Eastern and Southeastern Asia	China	3.67	3.54	3.58
SDG: Eastern and Southeastern Asia	China, Hong Kong Special Administrative Region	3.31	3.33	3.81
SDG: Eastern and Southeastern Asia	China, Macao Special Administrative Region	2.71	2.73	3.06
SDG: Eastern and Southeastern Asia	Japan	3.13	3.08	3.16
SDG: Europe and Northern America	Germany	4.87	4.98	5.12
SDG: Europe and Northern America	United States of America	5.12	4.93	4.99
SDG: Europe and Northern America	France	5.45	5.41	5.35
SDG: Europe and Northern America	Italy	4.04	4.26	4.10
SDG: Europe and Northern America	United Kingdom of Great Britain and Northern Ireland	5.43	5.20	5.25
SDG: Europe and Northern America	Russian Federation	4.69	4.68	3.52

Source: http://sdg4-data.uis.unesco.org/

Statistical Analysis

One-way analysis of variance has been used to see the statistical significance difference in expenditure among the countries and for different time period. MS Excel and SPSS 21.0 version were extensively used for the statistical calculation.

Results and Interpretation of Statistical Analysis

Table 3: Summary

Groups	*Count*	*Sum*	*Average*	*Variance*
France	3	16.21	5.403	0.003
United Kingdom of Great Britain and Northern Ireland	3	15.88	5.293	0.015
United States of America	3	15.04	5.013	0.009

Groups	Count	Sum	Average	Variance
Germany	3	14.97	4.99	0.016
India	3	12.59	4.197	0.067
Italy	3	12.4	4.133	0.013
China	3	10.79	3.597	0.004
China, Hong Kong Special Administrative Region	3	10.45	3.483	0.08
Japan	3	9.37	3.123	0.002
China, Macao Special Administrative Region	3	8.5	2.833	0.039

Source: Author's calculation.

Table 3 shows descriptive statistics of government expenditure on education as a percentage of GDP among the selected economies. Average expenditure is highest in France, at 5.40, and lowest in China, Macao Special Administrative Region.

Table 4: One-Way Analysis of Variance (ANOVA) Comparing Government Expenditure on Education as a Percentage of GDP (%) Among Top 10 Economies

Source of variation	SS	df	MS	F	P-Value	F Crit
Between countries	23.53	10.00	2.35	36.99	0.002*	2.29
Within countries	1.39	22.00	0.06			
Total	24.934	32.000				

Source: Author's calculation.

H_{01} is rejected. Table 4 shows that F = 36.998* is significant at 5% level as p = 0.002 < .05, which shows that all the selected economies are contributing differently as a percentage of GDP (%).

Table 5: Descriptive Statistics of Government Expenditure Between 2020 and 2022

Years	Count	Sum	Average	Variance
2020	10	46.73	4.248182	0.906096
2021	10	46.52	4.229091	0.847029
2022	10	45.84	4.167273	0.736382

Source: Author's calculation.

Table 6: One-Way Analysis of Variance (ANOVA) Comparing Government Expenditure on Education as a Percentage of GDP (%) in 2020–22

Source of Variation	SS	df	MS	F	P-Value	F Crit
Between groups	0.03	2	0.01	0.02	0.97	3.31
Within groups	24.89	27	0.82			
Total	24.93	29				

Source: Author's calculation.

H_{02} is accepted. Table 6 shows that F = .02371 is not significant at 5% level of significance as p = 0.9765 > .05, which shows that government expenditure on education as a percentage of GDP (%) did not differ significantly over the period of time.

CONCLUSION AND DISCUSSION

SDG 4 focuses on education and aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". No country

can achieve sustainable development, and social and economic growth without education. Therefore, countries make significant contributions to improve their education system and also share percentage of GDP for the same. The present study is focused on government expenditures in the top 10 world economies – India, China, Hong Kong Special Administrative Region, China, Macao Special Administrative Region, Japan, Germany, the United States of America, France, Italy, and the United Kingdom. The study also analysed how education expenditure changed in these selected economies during 2020–22. The analysis shows that government expenditures as percentage of GDP is highest in France followed by the United Kingdom of Great Britain and Northern Ireland, the United States of America, and Germany. Japan, China, Italy, and India are the economies that show lesser expenditure on the education system. China, Macao Special Administrative Region shows the least government expenditure on education. While making a comparison among all the selected economies, the countries are significantly different in the expenditure for education.

In terms of public education spending, France came in first position. The results are supported by the Organization for Economic Cooperation and Development (OECD) report, in comparison to the OECD average; France dedicates a larger share of its national wealth to education. France spent 5.4% of its GDP on education in 2020, which is 0.4% points more than the usual for the OECD. Primary, secondary, and post-secondary non-tertiary education together received a larger part of France's GDP (3.9% vs 3.6% on average) than the OECD average, while tertiary education received a slightly higher share (1.6% vs 1.5% on average).

In terms of public education spending, the United Kingdom came in second. Given how important education is in the United Kingdom since 1999, some regions of the country have made ongoing policy initiatives aimed at improving the educational system. According to the Institute for Fiscal Studies (IFS), which is the country's important autonomous economics research institute, the Scottish government decided on policies regarding student funding for higher education. Students who decide to continue their higher education in Scotland are not required to pay tuition; instead, the Scottish government covers the cost of their education. Further, the government of Scotland provides financial assistance up to GBP2,000 to poor students. According to the Commons Library Research Briefing, 17 November 2021, the total funding increased by 2.0% real annual average to reach GBP86.7 billion in 2024–25 in the United Kingdom. The real yearly rise in resource (day-to-day) spending is 2.2% on average. This entails a corresponding increase in the core schools budget, which increased to GBP56.8 billion. In real terms, the total amount spent on skills will rise by 26% during the next five years, until 2024–25. This includes a 28% real increase in financing over five years for education for 16- to 19-year-olds and a 29% increase in money for adult skills.

The United States of America stands at third position in government spending on education. The result shows that an average of 5.01% of GDP is set aside for education, although the amount the country spends on public education lags behind economic growth and is below global standards. According to Hanson and Melanie (2023) K–12 schools receive USD794.7 billion, or USD16,080 per student, annually. For K–12 public education, the central, state, and local administration grants USD810.0 billion, or USD16,390 per student.

In terms of government investment on education, Germany comes in fourth position. The average percentage of GDP that the government spends on education is 4.99. In 2019, Germany announced further steps for the Digital Pact of Schooling during the early phase of the COVID-19 pandemic. By establishing digital content, encouraging teachers' digital capabilities, and supplying schools with digital infrastructure, it has attempted to assist students in upgrading their skill sets. The country's educational institutions were enabled to upgrade their digital infrastructure with the help of EUR100 million that the federal government set aside in March 2020. Further investments totalling EUR500 million were made later on to buy instructors' digital infrastructure and individual digital devices for underprivileged pupils.

The result of the studies shows that India spends 4.19% of GDP on education, which is lesser than the other mentioned economies. India is among the most populated economies; therefore, privatisation is one of the alternatives to increase spending on education. Since the 1950s, private education spending has increased five times as a percentage of private final consumers' spending,

demonstrating the importance that households place on education. Motkuri and Revathi (2024) have supported the results and discussed how private education spending has increased as a result of insufficient public education funding, particularly in light of the rising demand for education, which has significant effects on access to education and affordability. A further noteworthy pattern over the past three decades is the growth in private education spending exceeding that of state spending. During this time, the proportion of public to private education spending has been falling. This is a reflection of India's growing education privatisation. Wide-ranging policy ramifications are associated with this tendency, particularly in higher education. The COVID-19 pandemic had an impact on the rise in both public and private school spending. According to an economic analysis, there is no correlation between public and private spending on education. Despite having a differing causal direction, they have an equilibrium relationship with GDP over the long term. While private education spending is a direct result of the country's GDP, public education spending is what drives it.

On the other hand, government spending in China, Macao Special Administration Region was found to be the lowest but Macao went through a slow transformation to revive the education system. Its expanding and fiscal policy endorsed education institutions to condense the class size along with extracurricular activities. Macao used the international assessment system to monitor school performance because of which students are benefitting.

The present study also concludes that from 2020 to 2022 government expenditure did not change; indeed, it decreased over the period of time. One of the potential reasons could be the COVID-19 pandemic in 2020–22 when governments could not make significant contributions to improve education.

To achieve SDG 4, governments should now shift their focus to education and promote lifelong learning through capacity building and financial assistance. Gupta (2004) supported through evidence that public spending has a direct link with education. Measures of school attainment that are commonly used benefit from increased public spending on elementary and secondary education. Gross secondary enrolment increased by more than one percentage point when the proportion of expenditures allocated to primary and secondary education is increased by five percentage points. There is a strong need to invest more in elementary education, teacher's training and development, and digital infrastructure. Hajebi et al. (2023) also supported that government spending on education has a sizeable beneficial impact. Government spending on education can be a powerful tool for promoting knowledge acquisition and educational advancement. On the other hand, higher educational attainment is associated with a country's increased human capital, which in turn promotes economic growth and the reduction of inequality.

The advancement of SDG 4 necessitates a comprehensive strategy for education financing and reform. The degree of change required will not be achieved by experimental programmes or short-term initiatives, but rather by co-ordinating efforts to strengthen medium- and long-term educational systems that can provide an education that is equitable and inclusive. The creation of nationally relevant educational industry plans should be a key responsibility of national governments. However, for these plans to be successful, they must guarantee regular and methodical conversation with educators, parents, parliamentarians, and civil society organisations to forge the consensus required to maintain reform. Global players can and should play a part, but they work best when they support national systems and procedures rather than trying to impose their own ideas. Further, private players' partnership could be one of the stepping stones for achieving the SDG.

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