

Proposed Financing Alternatives for Investment in Egypt's Technical Education Schools: Insights from International Experiences

By

Elsayed Ahmed Abdelghaffar¹, Amany Salah Mohamed², Gamil Elsayed Ahmed³

Abstract

Financing technical education is a critical issue for educators and economists in both developing and developed countries. This research aims to propose financing alternatives for investment in technical education by drawing on international experiences. Utilizing a descriptive methodology, the study thoroughly describes and analyzes potential financing alternatives to provide viable options for funding technical education in Egypt. The research sample comprised specialists in investment and finance from the General Authority of Investment, Investors' Associations, and experts in the economics of education to gather insights on potential financing alternatives for technical education in Egypt. The study identified five main categories of financing alternatives: Supply-Side Funding, Demand-Side Financing, Collaborative Financing, Self-Financing, and Aid-Based Financing/International Partnerships. Each category includes appropriate financing alternatives tailored to the specializations within technical education. Based on the study's findings, a proposed concept for financing alternatives for investment in technical education, considering international experiences, was developed. The study concludes with a set of recommendations and identifies areas for further research.

Keywords: Investment in Technical Education, Financing Alternatives, International Experiences

¹ Research Professor at Technical Education Research Division- National Center for Educational Research and Development

² Associate Professor at Technical Education Research Division- National Center for Educational Research and Development

³ Research Doctor at Technical Education Research Division- National Center for Educational Research and Development

Introduction

Egypt is increasing the budget for technical education in response to the growing social demand, particularly with the implementation of the Competency-Based System (CBS). However, relying solely on government support for funding technical education presents several challenges. These challenges include the high cost of educational services, unidimensional funding approaches, economic and industrial changes, and the growth of both population and knowledge.

These challenges place a significant burden on the state budget, necessitating the exploration of alternative financing methods. The Minister of Education and Technical Education underscored this necessity during a community dialogue on the ministry's strategic plan (2024-2029), emphasizing the importance of innovative financing solutions to address the funding shortfall caused by structural changes (The Information and Decision Support Center, 2024). Adequate funding directly correlates with the efficiency, effectiveness, and quality of the education system (Sulasmi et al., 2023). Economists have observed that national production increases are not the primary drivers of technological progress; instead, the quality and level of education are crucial indicators of development (Mustafa Kafi, 2017).

While developed countries are exploring new educational financing alternatives to mitigate the effects of the global economic crisis, developing countries must reevaluate their educational resources, reduce inefficiencies, and explore proposed financing alternatives to achieve better funding and returns (Ali and Mayada, 2015).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) report within the Education 2030 Action Project framework, emphasizes the critical role of increasing private sector involvement in education and treating education as a public good that requires successful partnerships with the private sector. The report also highlights that governments in developing countries have often failed to meet their citizens' educational aspirations due to their monopolistic control over education (UNESCO, 2018). "Hadia Al-Yami (2018) recommended granting different levels of educational administration full financial and administrative autonomy, emphasizing the importance of learning from international experiences in educational financing, and underscoring the importance of drawing lessons from international experiences in educational financing. These include Malaysia's integration of the private sector in planning and implementation, China's privatization of vocational education, and the Philippines' provision of individual grants for school maintenance and operational costs to help schools meet minimum standards (Al-Jawhara, 2021). Therefore, leveraging international experiences in educational financing and investing in technical education are crucial steps for technical education development.

Research Questions

The research aims to bridge the funding gap and attract investment in technical education, drawing on international experiences. The research questions are as follows:

- 1- What is the current status of investment and financing in technical education in Egypt?
- 2- What are the key international experiences in financing technical education?
- 3- What perspective can be proposed for providing financing alternatives for investment in technical education, based on international experiences?

Conceptual Framework

The research explores two main aspects: the first deals with the current state of investment and financing in technical education in Egypt, focusing on the societal variables driving investment in technical education, the proportion of public to private education within the technical education sector, current funding mechanisms and expenditure patterns, and the most important investment opportunities available in technical education in Egypt. The second aspect explores key international experience for investment and financing of technical education, including the experience of some European countries (Germany - Spain - England - Turkey) as well as the experience of some Asian countries (Singapore - Malaysia - Japan - Vietnam - Korea), and ends with a comparative analysis underscoring the strengths and weaknesses of each country's approach. The conceptual framework will guide the investigation into bridging the funding gap and attracting investment in technical education, drawing on both local contexts and international best practices.

1. The current status of investment and financing in technical education in Egypt

In March 2022, Egypt launched the National Strategy for Technical Education Development. This strategy aims to enhance existing schools, increase the number of schools and classes, develop curricula, improve teachers' capabilities, and raise awareness of the importance of technical education. It is supported by seventeen documents proposing various solutions and development mechanisms, with a focus on motivating the private sector to invest significantly in development projects. The strategy also identifies types of technical education suitable for financing and investment, ensuring the technical workforce meets labor market requirements through mixed finance mechanisms. The Sovereign Fund of Egypt plays a crucial role as a strategic partner, providing land, logistical, and legal support through its investment body in the field of education (Nader Kheder, 2023).

In the same context, the Global Education Monitoring Report by the World Bank and UNESCO (2022) revealed that the private sector and non-governmental organizations have a stronger presence in technical education compared to public education. Approximately 40% of technical and vocational education students are enrolled in private institutions. On the other hand, public education is not entirely free. Families contribute approximately 30% of the total expenditure on education globally, with about 8% of families borrowing to cover education costs. This percentage sometimes exceeds 30%. Therefore, the current state of investment and financing in technical education in Egypt can be analyzed through the following aspects:

1-1. Societal Variables Driving Investment in Technical Education in Egypt

The Egyptian society, like other societies, is influenced by the global conditions and the changes they impose. The variables affecting technical education include:

1-1-1. Population Growth (Population Explosion):

1-1-2. The rapid population growth is a notable characteristic of Egyptian society. The population reached 76.7 million in 2008, 90.6 million in 2015, and 105.1 million in 2023 (Central Agency for Public Mobilization and Statistics, 2024). This growth demands more schools, universities, and housing, necessitating an increase in technical schools to meet the

rising demand. Consequently, this requires substantial financial funding and expenditure, highlighting the need for new financing alternatives.

1-1-3. **High Inflation Rates and Price Rise:**

The Inflation rate in Egypt increased from 2.8% in 2000 to 5.7% in 2005, then jumped to 13.6% in 2010 (The Economist, 2011). Egypt had the second-highest inflation rate globally after India. The current account balance deficit reached \$216 billion in 2010. Inflation rose to 38% in September 2023, before decreasing to 35% in October 2023 (Central Agency for Public Mobilization and Statistics, 2024). This adversely affected the state budget and education funding as the Egyptian pound depreciated and prices doubled.

1-1-4. **Centralization and Dependence:**

The education philosophy in Egypt, based on centralization and reliance on the government, particularly in technical education finance, has led to dependence. Consequently, the technical education budget is primarily sourced from the government, resulting in inadequate educational spending. The average current spending on pre-university students in Egypt in the 2023/2024 academic year is 160 billion pounds (approximately 3.3 billion dollars). The Education Financing Monitoring Report 2022 noted that per capita spending in upper-middle-income countries is 150 times higher than the average in low-income countries (The World Bank and UNESCO, 2022).

1-1-5. **Technological Innovations Inclusion in Technical Education:**

Incorporating technological innovations into technical education has become essential to achieve diversity and integration in the educational process, train technical education students effectively, and create an educational environment that meets learning goals. This includes accessing information and interacting with it (Saber Hussein, 2022). To support these initiatives, it is essential to provide financial backing for technical education to procure various technological devices and innovations.

1-1-6. **The Global Financial Crisis:**

Currently, the world is facing a series of financial crises exacerbated by regional conflicts, such as the war on Gaza, and the ongoing COVID-19 pandemic. These factors have led to shortages in inputs, declines in manufacturing industries, increased commodity prices, unprecedented inflation rates, declining growth rates, and increased fragility of financial institutions due to rising debt levels. The International Monetary Fund (IMF) predicted a global growth rate decline from 5.9% to 3.2% in 2022, with further projections to decrease to 2.7% in 2023 (Al-Ahram Center for Political and Strategic Studies, 2022).

The Egyptian economy has been significantly affected by this crisis, resulting in a substantial financing gap that can only be filled through investment. Consequently, financing for pre-university education, especially technical education, has been severely impacted by the economic downturn. With the growing demand for technical education and rising costs, the financing problem has become more acute. Technical education urgently requires financial support (Taha Abdel Alim, 2019).

The Growing Trend Towards Privatization and Private Schools in Egypt:

Egypt has moved towards privatizing education in response to its inability to provide high-quality education and reduce its economic and social roles. This shift has led to the

emergence of private schools (Abdel Hafez, 2018). Furthermore, there has been an increase in the ratio of private schools to the total number of schools in pre-university education, as well as in the percentage of student enrollment in these schools.

1-2 Size and Diversity of Public and Private Education within the Technical Education Sector

The ratio of public to private technical education schools varied during the academic year 2023/2024 (Statistics from the Ministry of Education and Technical Education). Private education holds a notably high percentage in specific areas:

- Private hotel education schools enroll 185% more students than their public counterparts.
- Private commercial education schools represent nearly two-thirds (62.7%) of the total number of schools and enroll 52.8% of new students in the first grade of commercial education.
- Private industrial education schools represent 40.2% of the total number of schools and enroll 36.4% of new students in the first grade of industrial education.
- Private agricultural education schools enroll 41.7% of new students in the first grade.

The number of private technical secondary schools has increased by 18.8%, compared to a 2.4% increase in public schools. This underscores the significant role played by private technical education in Egypt. Public education is funded by the government through public spending, covering infrastructure, salaries, and educational resources. Public education benefits from access to various educational resources and services funded by public spending. In contrast, private education relies on tuition fees, private donations, and funding.

1-3 The Current State of Funding and Expenditure in Technical Education in Egypt:

In the academic year 2023/2024, the Egyptian government allocated 230 billion pounds to the education sector. However, this amount falls short of the 710 billion pounds needed to reach the constitutional requirement of 6% of GDP (12 trillion pounds). Despite an increase in government spending on technical education in absolute terms, it has decreased as a percentage of total government expenditure and GDP.

1-3-1 Technical Education Allocations According to the Ministry of Planning Report (2022)

According to the Ministry of Planning's report, "Harvest of Eight Years of Building the Egyptian Man in the Field of Educational Services," allocations for technical education increased by 233%, totaling 50 billion pounds in 2022 compared to 15 billion pounds in 2014. The number of technical education school classrooms increased by 8.7%, with more than 50,000 classrooms in 2022 compared to 46,000 in 2014. These improvements contributed to reducing drop-out rates in technical education to 0.1% in 2021, down from over 5% in 2014.

1-3-2 Technical Education Allocations in the 2023/2024 Budget

A total of 392.4 billion pounds has been allocated to pre-university education, an increase of 75.4 billion pounds over the previous year. However, technical education accounts for only 10% of this budget, which is insufficient to meet its goals. To address this, cooperation protocols have been established with international development partners, such as

the TVET program funded by the European Union and the Egyptian government, the Employment Support Project, and the Technical Support Project for the Comprehensive Technical Education Initiative funded by the German government through the German Agency for International Cooperation (GIZ), and the Egypt Workforce Project funded by USAID. Additionally, partnerships with major international companies like IBM, Schneider, KFC, Toshiba, Ghabbour, and Americana, as well as local supporters such as Talaat Moustafa Group, Al-Suwaidi, Al-Arabi, Fathalla, Fresh, Telecom Egypt, and B-Tech, have helped increase investment opportunities and projects in technical education in Egypt.

1-4 Investment Opportunities in Technical Education in Egypt

There is a growing interest in developing technical education and training in Egypt, with a focus on strengthening partnerships with local and international entities. These efforts aim to improve the quality of technical education, qualify technical cadres in various fields, and produce graduates who meet the requirements of both local and international labor markets, aligned with competencies and applied technology standards. This creates numerous investment opportunities in the technical education sector in Egypt.

1-4-1 Investment projects in partnership with the private sector:

1-4-1-1 *Implementation of Global Village schools* in cooperation with the Sovereign Fund of Egypt while providing investors with more incentives related to land prices and interest, so that they can provide a distinguished educational level, without exaggeration in tuition fees, fulfilling their desire to send a distinguished-level graduates abroad.

1-4-1-2 *Expanding the model of applied technology schools in partnership with the Federation of Industries.* The role of the state is to provide land, speed up licensing procedures, and participate in management. (100) sites have been allocated to establish (100) schools to expand applied technology schools.

1-4-1-3 *Signing two cooperation protocols to transform two technical education schools into the applied technology system.* The first one is in Damietta Governorate in the specializations of (welding - metal formation - electrical installations - furniture trade - logistics). The school accommodates 200 students in the first grade up to 600 students within three years in cooperation with an international organization to provide certificates at the international level for the school and its graduates. El Sewedy Electric operates and manages the renovated and equipped school, the Ministry of Petroleum and Mineral Resources participates in monitoring the project and Damietta Natural Gas Liquefaction Company coordinates and comprehensively implements the project activities. The second one is in the city of El Alamein, Matrouh Governorate, in hotel specializations (kitchen-room supervisor). The school accommodates 200 students in the first grade and up to (600) students within three years.

1-4-2 Projects that have been signed:

1-4-2-1 The signing of a financing agreement between the Egyptian government represented by the Central Bank, the Ministry of Education and Technical Education, the German government and the European Union through the German Development Bank, and in coordination with the Ministry of International Cooperation; The total value of the agreement is about (51) million euros through 18 million euros as a grant, 20 million euros as a loan

from the German government and an additional grant from the European Union of 13 million euros. Germany, through the Development Bank, also provides non-refundable financial contributions of 32 million euros to the comprehensive technical education initiative in Egypt, through which 25 Egyptian centers of excellence are established, which are specialized centers, applied technology centers, sectoral centers of excellence in the field of renewable energy, and technical schools. The objective is to enhance technical education and vocational training and promote sustainable energy in technical education and vocational training.

1-4-2-2 - Signing a framework agreement between the General Authority of the Suez Canal Economic Zone, Elsewedy Electric and Banque Misr (Bank of Egypt) to establish an academy for dual technical education and vocational and technical training for technical workers and qualify them to work in industrial projects established within the industrial zone in Sokhna, at an investment cost of forty-five million Egyptian pounds as the project is financed equally between Banque Misr and Elsewedy Electric (Climate Change Summit COP27, 2022). The objective is to prepare skilled workers capable of filling the gap of requirements for working in green fuel complementary industries projects such as the manufacture of electrical analyzers, solar panels, etc.

1-4-2-3 - *Establishment of the Technical and Vocational Education Teachers' Academy (TVETA)* to be part of the Ministry's new organizational structure. The objective is to train technical education teachers in technical specializations, especially the system of vocational competencies, and how to evaluate these competencies.

1-4-3 Projects under implementation

There are several investment opportunities in the field of technical education through projects and investment opportunities such as; offering several productive training centers available for rehabilitation as applied technology schools in partnership with the private sector as well as several 18 centers in the governorates of: Beheira, Port Said, Gharbia, Damietta, Beni Suef, Sharqia, Minya, Assiut, Ismailia, Sohag, Luxor, Aswan, Menoufia, and South Sinai in addition to 58 schools in various types of education planned to be converted into applied technology schools in partnership with the private sector in the governorates of Aswan, Ismailia, Luxor, Beheira, Sharqia, Gharbia, Fayoum, Qalyubia, Assiut, Beni Suef, Port Said, South Sinai, Damietta, Sohag, North Sinai, Qena, Kafr El-Sheikh, Mersa Matrouh, Damietta, Suez, the New Valley, and Dakahlia.

1-4-4 Future projects based on Egypt's investment map:

The investment map is the source of deriving the current and future labor market requirements. The Education Fund has recommended the need to fully link the map of technical education in all its schools and programs with the investment map throughout Egypt for achieving a technical education system based on the requirements of the labor market and equipping trained workers to serve the investment map projects. Through conducting a comprehensive survey of Egypt's investment map, which reviews all investment sectors available in all governorates of Egypt, whether industrial, commercial, agricultural, architectural, tourism, and entertainment (Amani Salah, 2021), a list of opportunities available in the investment map and its quality that suits technical education was reached.

2. The International Experience in Investing and Financing of Technical Education

Many countries have extensive experience in financing and investing in technical education. Some of these experiences will be discussed below:

2-1 Singapore's Experience

TVET institutions in Singapore are considered among the most effective global systems in terms of participation and employment rates. They respond quickly to changing economic and employment structures, with all chairmen of the boards of directors coming from private technical education institutions. Additionally, there are close links with business owners and industry, which guide economic trends, finance, and human resources issues. The state allocates about 20% of its annual operating budget or 3% of its GDP to education.

The government provides substantial support for technical education by financing the full cost of land, buildings, facilities, and equipment. It also supports between 80% and 90% of the operating costs of vocational education and training institutions, making fees low-cost. The private sector sometimes shares the remaining costs, and a special fund for donations within educational institutions is also available (Varaprasad, 2015; Varaprasad, 2022; Teo & Koh, 2024).

Singapore adopts several strategies to maximize resources, increase investments in technical education, and diversify funding mechanisms through:

- Enhancing its competitiveness as a regional education hub that welcomes talented international students who pay tuition fees. This strategy is a source of funding and investment for Singapore's technical education.
- Strengthening partnerships between Singapore's leading public sector agency, the Agency for Science, Technology and Research, business investors, and academics to bridge the gap between academics and the labor market.
- Increasing support for scientific research and maximizing resources, positioning Singapore as part of Silicon Valley, the Biopolis, and Fusionopolis Groups.
- Motivating companies to develop the skills of their foreign workers to obtain work permit approvals, which improves quality and productivity. The cost of training is usually borne by the employer.
- Encouraging a culture of entrepreneurship among students by providing incubators, mentorship, and funding from venture capital funds to help them start their own companies during their studies.
- Adopting a scholarship program for all Singaporean citizens that offers significant discounts on tuition fees, with the value varying by educational institution and program.
- Providing additional funds to low-income students or those from ethnic minorities through scholarships from the Ministry of Education, Community Development Council, Citizens Advisory Committee, or Mendaki.
- Offering loan reimbursement programs for students who are unable to pay fees, with the condition that the graduate works for the sponsoring organization for several years equivalent to the support received.
- Encouraging foreign direct investment through the Economic Development Council by leveraging the expertise, skills, and technology available from private sector partners and multinational companies.

- Involving civil society organizations in providing educational programs and services for vocational training, including monthly donations to support the development of technical education.
- Requiring high-income technical education students to pay tuition fees in educational institutions located in wealthy residential areas.
- Establishing international institutions for technical and vocational education supported by the local labor market both financially and technically. These institutions provide training devices for students that simulate real-world conditions, with training laboratories converted into virtual workshops to reduce costs. This approach strengthens the relationship between technical education and labor market institutions, develops teachers' capabilities, and increases financial returns.

2-2 Vietnam's Experience

To invest in the technical education sector, the Vietnamese government issued Decree 15/2019, which includes a set of conditions to attract more foreign investments in technical education and vocational training institutions:

- The minimum foreign invested capital is 5 billion VND (approximately 217,000 USD), and the establishment should cover at least 1,000 m² in urban areas and 2,000 m² in rural areas. Additionally, the investor must have at least 5 years of experience in the field and possess a recognized legal entity.
- The investor must pay at least five years' worth of infrastructure and facilities rental value in advance, and the invested capital must reach 25% of the minimum required for establishing a vocational education and training institution.
- Educational content in curricula must not threaten public interest, national defense, or insult the country's history, religions, customs, and culture.
- The maximum period of operation for a vocational education institution with foreign investment is fifty years from the date of its founding license. Both Vietnamese and foreign training programs may be used by regulations (Nguyen-Hoang & Ngoc, 2023; McGuinness et al., 2021; Vietnam Law Magazine, 2024; Cekindo, 2021).

2-3 China's Experience

China allows foreign investors to invest only in vocational education but restricts them from investing in other stages of education. Investment in Chinese education companies specializing in teaching content is also prohibited. However, foreign investors can cooperate with the Chinese government in investing in educational technology for vocational schools. The Chinese government is expanding the vocational education system by reviewing the vocational education law and announcing a three-year action plan (Tian, 2019; McGuinness et al., 2021; The Financial Times Limited, 2022; Nguyen-Hoang & Ngoc, 2023; Wang, 2024). This plan includes:

- Granting subsidies to the private companies that develop apprenticeship programs.
- Encouraging investors and the private sector to upskill the Chinese workforce, especially low-income rural workers, to meet the needs of advanced manufacturing sectors.
- Shifting from centralization to decentralization in vocational education training processes.

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- Improving financial and tax incentives for investors in vocational education by facilitating procedures and granting clear powers and responsibilities for participating in the training processes of technical education and vocational training students.
 - Allowing foreign investors to establish vocational training institutions in Chinese Free Trade Zones without a local partner.
 - Amending the regulation of Chinese cooperative education to encourage foreign investment to promote Beijing's service sector and investment in non-academic vocational training institutions according to industrial needs throughout the country.
 - Encouraging industry-leading companies to run vocational education programs, participate in developing curricula and educational materials for vocational institutions, and research micro, small, and medium-sized enterprises.
 - Partnerships between the Chinese government and investors have led to increased employment rates among technical education graduates, which reached 95%, and higher average salaries for secondary vocational school graduates compared to Chinese university graduates.

2-4 Malaysia's Experience

Malaysia exemplifies how to build public-private partnerships through legislation and laws. The Malaysian government passed the Human Resource Development Act in 1992. This law funds the Human Resources Development Fund, which distributes money to companies that use it to train their workers. The funds, transferred by industrial companies, are spent on apprenticeships and other training activities. Malaysia has made significant efforts in Technical and Vocational Education and Training (TVET):

- The Malaysian government has encouraged the private sector participation in the policy development and implementation initiatives within the public-private partnership model through the continuous development of the TVET system, aiming to increase the ratio of skilled workers in Malaysia.
- TVET is a critical sector in Malaysia's economic transformation program. The government has allocated financial resources to the Skills Development Fund to encourage high-quality training through accredited private sector centers. The general framework for public-private partnership for skills development includes:
 - The National Dual Training Agency, which gives industrialists significant participation and supports cooperation between the public and private sectors in curriculum development, training, and infrastructure provision.
 - An Apprenticeship Program for workers' reskilling and upskilling, an industry-oriented training program delivered through an integrated model of on-the-job and institutional training. Trainees are granted financial and job benefits after completing the program.
 - The Work-Based Learning Program, which involves restructuring the community colleges by signing memorandums of understanding with thirty-three companies to collaborate in areas of mutual benefit such as curriculum development and implementation and student evaluation. It includes mandatory industry experience in the companies participating in the program (Vinayan et al., 2020; Usman & Ab Rahman, 2023; Sandrasegaran & Rambeli, 2024).

2-5 South Korea's Experience

The management of technical education in South Korea is based on a partnership among various bodies and stakeholders, including ministries, businessmen, economic companies, government and private factories, ministries of manpower, finance, relevant ministries, professional unions, and parents. These stakeholders collaborate to draw up the general policy for technical education, determine criteria for selecting students, vocational specifications and courses, plan training programs and projects, and standardize labor market skills requirements (Nabawi, 2020; Tolliver et al., 2021; Kim et al., 2022).

2-6 Germany's Experience

The German government allocates a significant portion of its budget to financing technical and vocational education, which is central to the country's educational system, comprising about 75% of total education in Germany. The education budget is distributed between the federal government, states, and some private capital bodies, with contributions varying according to each state's income and budget size. Some states spend between 16% and 40% of their total budget on education. The education budget in each state covers teachers' salaries, pensions, and school management expenses, while local authorities provide funds for educational infrastructure and maintenance. Technical and vocational education programs are funded by the government to strengthen the link between education and the labor market, with the private sector also contributing to funding through the following measures (Müller et al., 2016; Cedefop, 2020; Mahrouse, 2020; Elasmay, 2021):

- Companies contracting with local authorities fund on-site training, while in-school education is funded by the government or local authorities.
- Funding for education is distributed among the federal government, states, and municipalities of cities and villages. Federal states and municipalities pay the salaries and expenses of teachers and workers.
- All states provide free educational materials to students. Authorities allocate transportation for students to and from school.
- Students have the right to receive financial aid under the Law on the Promotion of Qualification for Occupations.
- There are no education-specific taxes, as education is funded through public taxes collected by states or local governments.
- Companies and factories offer technical assistance, including vocational and technical training programs, to prepare students for various jobs and provide them with practical skills and experience.
- Public and private universities participate in enriching educational activities in educational institutions.

2-7 Spain's Experience

Technical education and formal vocational training in Spain are funded by the government, with the largest share coming from public sources, especially from education and employment authorities at the state level. Public spending on education as a percentage of

GDP was 4.94% in 2020/2021, with technical education and vocational training accounting for 30.6% of total public education spending. The Ministry of Education provides public funds to finance education. The private sector and student families also contribute, with families covering a certain percentage of the costs while the state covers the rest. Participation includes the following (Boto-Álvarez et al., 2020; Cedefop, 2023; ReferNet Spain and Cedefop, 2023):

- Investors, the private sector, and companies establish a training fund.
- The primary source of funding for vocational training is the state budget.
- Employers finance about 40% of training costs.
- Training program funding is managed at the state level, allowing numerous investments to develop various projects, programs, and procedures.

2-8 Turkey's Experience

The Turkish government has implemented several policies to motivate private investors to participate in vocational education and training, including (Ateş, 2022; Somuncu, 2022):

- Enacting the Private Education Institutions Law to support incentive policies for increasing the private sector's share and participation in vocational education and training.
- The amount of financial support is determined annually by the Ministry of National Education, the Ministry of Finance, and the Treasury per the legal regulations starting from the 2012/2013 academic year.
- Incentives have increased the private sector's share in vocational education and training since the 2012/2013 academic year.
- Curricula and educational programs are developed based on the technical needs identified by the private sector.
- Cooperation between the government and stakeholders is strengthened to achieve professional and pedagogical development of teachers, support diversity in vocational education and training, enhance the perception of vocational education and training, and establish a quality assurance system.
- Partnerships have been established to create vocational education and training institutions involving representatives from the private sector, Istanbul Technical University, relevant ministries, and associations.
- Centers of excellence in vocational education and training are built through partnerships between the Ministry of National Education and chambers related to technical education, such as the Chambers of Industry and Commerce.
- The Ministry of National Education grants tax reductions to sectors that participate in providing products and services to vocational education and training institutions.

2.9 England's Experience

The Department of Education has decided, as part of reforms in funding technical secondary education in England, to take the following procedures (Foster et al., 2019; Department of Education, U.K. a, b, c, d, 2020; Fortwengel et al., 2021; Cedefop, 2023):

- Restricting government funding for technical secondary schools to disciplines that provide high-quality education and allow their graduates to study in higher education institutions.
- Preventing government funding for duplicate specializations that are similar to the new specializations in modern technical secondary education.
- Establishing a fund to finance technical secondary education in February 2020 to improve the quality of education in technical institutes and help them equip workshops and laboratories and modernize digital equipment and audio/visual applications.
- Imposing a tax estimated at 0.5% of the wages of all workers in each factory or farm and allocating it to finance the costs of training the technical education students provided within the production institutions.
- Involving the Chambers of Commerce, Industry, and Agriculture in designing the curricula for all specializations in modern technical secondary education and the applied technological universities gradually from 2021 to 2030.

We conclude that the patterns of financing in education, whether in developed or developing countries, depend on the partnership between the educational institution and the surrounding economic and political environment. There are also many levels and patterns of funding and overlapping parties that vary from one country to another according to the prevailing political and economic system. The prevailing trend is to share the costs of education between the government, community agencies, and the private sector. It is also clear that there are common links among countries' experiences. The most important characteristics included in these experiences can be summarized as follows:

- All experiences emphasized the importance and necessity of national participation in financing education.
- Setting mechanisms and legislative systems that determine the number of contributions and burdens borne by non-governmental organizations.
- The participation process in the technical education financing took several forms.

Methodology

The research used the descriptive method as it is suitable for the research topic and is based on accurately describing and analyzing all possible financing alternatives for investment in education to provide alternatives for the financing of technical education in Egypt.

Participants

The research sample consisted of 43 experts including a group of specialists in investment and finance from the General Authority of Investment, Investors' Associations, and specialists in the economics of education to identify their opinions on possible financing alternatives for investment in technical education in Egypt.

Data Collection and Measures

A questionnaire was prepared to present proposed financing alternatives for investment in technical education in the light of international experiences, through:

A. An analytical study:

- Financing alternatives in education in general, especially technical education.
- Interviews with experts working in investment and finance.
- Review of the previous studies and research.
- Analysis of recent trends in investment and finance, especially in technical education.

B. Objective of the questionnaire:

The questionnaire aimed to determine the degree to which experts in the field of investment and finance agree with the proposed alternatives.

C. The initial form of the questionnaire and its peer review to reach its final form

A list of proposed financing alternatives for investment in technical education was developed in light of international experience. The questionnaire was then given to specialists in the field to gather observations and suggestions on the clarity of verbal formulation, the scientific accuracy of terms in the field of investment and finance, and the inclusion of pivots of financing alternatives for investment in technical education. The questionnaire's validity and reliability were ensured through the following steps:

Validity of the questionnaire

To ensure the validity of the questionnaire, it was administered to a group of experts and specialists to identify their opinions. They agreed on the importance of all pivots of financing alternatives for investment in technical education, the linguistic accuracy of the questionnaire items, and the scientific accuracy of the phrases. They recommended adding the pivot: "Benefiting from students' talents as a supportive alternative to financing technical education" within the pivots of alternatives, as well as clarifying the symbols used in the pivots of the questionnaire, such as "PPP" and "BOT". They also recommended merging some phrases. The proposed amendments were made, and the questionnaire was deemed to have a degree of external validity and was finalized.

Reliability of the questionnaire

Reliability is one of the most important conditions for the application of the questionnaire (research tool) because it is related to the accuracy of the questionnaire in measuring what it was developed to measure. Reliability was calculated using Cronbach's Alpha coefficient, which was found to be 0.85, indicating a good reliability coefficient and thus confirming the questionnaire's suitability for application to the research sample.

Data Analysis

Close-ended responses were statistically analyzed using the Statistical Package for Social Sciences (SPSS). The analysis involved calculating frequency means, percentages, and the descending order of responses from the study sample members.

Results

The statistical analysis of the data obtained from the questionnaire responses included calculating the frequency means, percentages, and the descending order of responses from the study sample members. The results are presented in Table 1 below:

Table 1: Frequency means, percentages, and descending order

**determining the degree of approval of the sample members on the items of the
questionnaire according to each pivot**

Proposed financing alternatives for investment in technical education	Frequency mean	%	order
First: Supply Side Funding			
1-Relying on the state for investment financing to fill the financing gap.	1.09	36.58	10
2. Allocating a percentage of customs duties to finance technical education.	2.00	66.66	9
3. Allocating resources directly to improve educational infrastructure	2.97	99.18	1
4. Allocating resources directly to teacher training by providing financial support for training and professional development programs for teachers to enhance their teaching skills.	2.14	71.54	6
5. Allocating resources directly to curriculum development.	2.14	71.54	6
6. Allocating funds to build and maintain schools and classrooms and improve facilities to create a suitable learning environment.	2.85	95.12	3
7. Allocating the necessary financial resources to develop learning resources and provide educational materials, textbooks, and technology to enhance the learning experience.	2.22	73.98	5
8. Creating a specialized unit for investment in each technical school.	2.98	99.18	1
9. Establishing institutions to care for students and provide them with financial support.	2.14	71.54	6
10. Effective promotion of the programs offered to increase awareness and attract more potential students.	2.58	86.17	4
Second: Demand-Side-Financing			
11. Establishing a special fund aimed at supporting educational activities and vocational training.	2.90	96.75	3
12. Providing bonuses to institutions and individuals who innovate and contribute to developing technical education programs.	2.90	96.75	3
13. Encouraging partnerships between the public and private sectors by offering bonuses to institutions that contribute to improving the quality of technical education and training.	2.83	94.31	7
14. Giving rewards to outstanding and distinguished students in technical and vocational training programs.	3.00	100	1

Proposed financing alternatives for investment in technical education	Frequency mean	%	order
15. Creating an educational coupon system; Students are allocated financing coupons that are used for vocational training programs	2.83	94.31	7
16. Making follow-up and providing support for students who use coupons to ensure their continued success in their educational and vocational paths to prevent waste.	2.83	94.31	7
17. Creating special programs for investors that can include rewards such as discounts or gifts.	2.90	96.75	3
18. Establishing a comprehensive scholarship program covering various fields in technical education.	3.00	100	1
19. Assessing the financial needs of students and determining the level of financial support to be granted to each student.	2.78	92.68	10
20. Providing a guide for investors. to investment in technical education.	2.85	95.12	6
Third: Tripartite dialogue / collaborative financing (government-public sector - private sector) and Cost-sharing			
21. The private sector builds schools through self-financing. Like any project, it obtains financing from commercial banks with a guarantee for leases from the state for a period of 15 years, during which the private sector restores its capital and makes a profit for an appropriate period of time. Ownership returns to the state at the end of the lease period, which is a means for the state to achieve off-budget access goals. The private sector achieves an appropriate profit for an appropriate period of time and the ownership belongs to the State.	2.80	93.50	15
22. The outstanding student's small family benefits from free transportation, pensions, and summer resorts.	2.85	95.12	11
23. Participation of the private sector in the investment decision-making process.	2.88	95.93	9
24. Investing in the creative ideas of technical education students by establishing partnerships with the private sector to produce and market them and benefit from their returns.	3.00	100	1
25. Participation of civil society institutions through clear mechanisms to benefit from financing.	2.85	95.12	11
26. Providing sufficient and accurate information to the investor and the private sector about investment opportunities of technical education schools.	3.00	100	1
27. Establishment of contribution investment funds (students' fund/cooperative insurance...)	2.88	95.93	9

**Proposed Financing Alternatives for Investment in Egypt's Technical Education Schools
' Insights from International Experiences'**

Proposed financing alternatives for investment in technical education	Frequency mean	%	order
28. Establishing partnerships with investors.	3.00	100	1
29. Simplifying routine procedures and complexities in systems and regulations.	3.00	100	1
30. Preparing initiatives to activate investments that suit technical school nature and specializations.	3.00	100	1
31. Adopting the Public-Private Partnership (PPP) system.	2.95	98.37	6
32. Adopting the Build, Operate and Transfer (BOT) system as one of the financing methods.	2.90	96.75	8
33. Educational (research) endowment.	2.85	95.12	11
34. Imposing a technical education tax.	2.07	69.11	17
35. Free tuition fees	1.78	59.35	20
36. Human capital contracts that students commit to a contract that stipulates that they are obligated to pay part of their salaries after employment for a specific period in order to participate in financing education they obtained.	1.88	62.60	19
37. Graduation taxes, which are a tax added to the general income tax when graduates work, as a means to cover part of their education costs.	2.07	69.11	17
38. Rationalizing government spending on technical education by rationalizing the number of non-educational administrators, diverting most resources to improving teachers' capabilities and linking salaries to performance.	2.85	95.12	11
39. Forming school work teams to find supporters and build effective community partnerships.	2.93	97.56	7
40. Allowing the formation of a school honorary council similar to the honorary councils of sports clubs to contribute to financing (stakeholders - merchants - notables.....)	2.63	87.80	16
Fourth: Self- financing			
41. Developing the capital system by amending the Education Law in order to exploit the productive capacities of technical schools	20.80	93.50	16
42. Developing the financial sustainability of applied technology schools and sectoral centers of excellence	3.00	100	1
43. Attracting sponsors to the electronic platform for technical education and exploiting the revenue for the benefit of schools	3.00	100	1
44. Attracting sponsors to the TV channel for technical education and exploiting the revenue for self-financing.	2.83	94.31	15

Proposed financing alternatives for investment in technical education	Frequency mean	%	order
45. Good planning for developing technical school self-resources	3.00	100	1
46. Encouraging or reactivating the role of parents' councils to contribute to financing technical education.	2.44	81.30	12
47. Investing part of technical school walls in the form of commercial buildings and renting them to finance technical education.	2.85	95.12	12
48. Investing in technical school facilities beyond working hours and summer vacation to finance technical education.	2.95	98.37	10
49. Schools encourage donations and supporters by naming some classes or laboratories after donors and supporters.	2.83	94.37	14
50. Schools provide notes and question banks to students for a financial return.	2.44	81.30	21
51. The school provides photocopying services to students for a fee.	2.44	81.30	21
52. Renting some school facilities after the end of the school day.	2.56	85.37	20
53. Using textbook covers for advertisements as a supporting source for self-financing.	2.93	97.56	11
54. Reactivating the role of the productive school as a supportive source of financing.	3.00	100	1
55. Exploiting the walls of technical schools in an organized manner to display commercial advertisements for telecommunications, soft drinks, or food companies.	2.68	89.43	17
56. Legalizing private tutoring centers, imposing taxes on them and exploiting them for self-financing.	2.68	89.43	17
57. Converting technical schools into productive units/schools through the Permanent Capital Project for Education and Production and selling their products to the local community (serving the local environment).	3.00	100	1
58. Reactivating units of a special nature in technical schools, as they represent one of the best methods for achieving self-financing for schools.	3.00	100	1
59. Advertising and promoting the products and services provided by the units inside and outside schools through effective marketing management.	3.00	100	1
60. Providing good incentives to unit workers to encourage them to production.	3.00	100	1
61. Reactivating decentralization in the management of these	2.85	95.12	12

**Proposed Financing Alternatives for Investment in Egypt's Technical Education Schools
' Insights from International Experiences'**

Proposed financing alternatives for investment in technical education	Frequency mean	%	order
units.			
62. Organizing a conference to exchange experience between units of a special nature at the level of technical schools.	3.00	100	1
63. Establishing high-level school sports teams and holding matches between them and other famous teams, the income of which is allocated to the school self-financing.	2.59	86.18	19
Fifth: Aid-based funding/local partnerships and international donors			
64. Establishing students' bank.	2.5	82.93	14
65. Encouraging Arab Development Funds to finance technical education.	2.6	87.80	11
66. Listing an education company on the Egyptian Stock Exchange.	2.6	87.80	11
67. Educational platforms to provide education and training opportunities to address the growing demand for high-quality technical schools	2.9	95.12	6
68. The stock exchange is a financing platform for the education sector.	2.6	86.99	3
69. Encouraging private sector schools.	3	98.37	5
70. Cooperative insurance/a fund for educational cooperative insurance	2.8	93.50	9
71. Using technical school workshops for the necessary training to obtain a professional license for technicians.	3	100	1
72. Cost recovery by sharing.	2.7	90.24	10
73. Establishing educational funds	2.5	82.93	14
74. Providing school supplies.	2.9	95.93	6
75. Financing training centers.	3	100	1
76. Providing school meals.	2.8	94.31	8
77. Teachers' training.	3	100	1
78. Students' training.	3	100	1
Sixth: Benefiting from students' talents as a supportive alternative to financing technical education:			
79. Investing talented students' ideas in creating instructional	3	100	1

Proposed financing alternatives for investment in technical education	Frequency mean	%	order
aids.			
80. Increasing the awareness of technical school principals of financing plans and talented students' nurturing programs.	3	100	1
81. Knowledge gardens/ centers.	3	100	1

Considering the data in Table (1), it is clear that the research sample members, experts in the field of finance and investment, and specialists in the economics of education confirmed the great importance of all five pivots listed in the questionnaire. These pivots were derived from previous studies, international experience, international reports on financing education, and the theoretical framework of the research. The approval rate for most items related to investment and financing beyond the state and taxes ranged between 89% and 100%. The lowest approval rates were for items related to relying on the state for investment financing to bridge the financing gap (36.58%) and allocating a percentage of customs duties to finance technical education (66.66%). Below, the results of responses to all pivots of the questionnaire are discussed in detail:

The First Pivot: Supply-Side Funding

The results of this pivot are as follows:

- Approval rates ranged between 66.66% and 99.18%.
- The items "creating a specialized unit for investment in each technical school" and "allocating resources directly to improve educational infrastructure" both received 99.18% approval. The item "allocating funds to build, maintain schools and classrooms, and improve facilities to create an appropriate educational environment" followed closely with 95.12%.
- This indicates that one of the most important trends among expert respondents is that the state's mission should focus on allocating available resources to improve educational infrastructure and facilities if it relies on supply-side funding. This is consistent with experiences in Germany and Singapore, where local authorities and the state play significant roles in funding educational infrastructure.
- The item "reliance on the state for investment financing to bridge the financing gap" received the lowest approval, indicating that expert respondents prefer partnerships over sole reliance on the state. This is confirmed by the experience of sub-Saharan African countries, where central government funding has led to a serious scarcity of funds and financing in technical education.

The Second Pivot: Demand-Side Financing

The results of this pivot are as follows:

- Approval rates ranged between 92.7% and 100%, indicating broad agreement among respondents.
- The items "establishing a comprehensive scholarship program that covers various fields in education" and "giving rewards to distinguished and outstanding students in technical vocational training programs" both received 100% approval. This suggests that expert

respondents value providing comprehensive programs through scholarships and rewards for outstanding students in technical education and vocational training. This aligns with Singapore's scholarship program, which offers significant tuition discounts.

- The item "assessing the financial needs of students and determining the level of financial support to be granted to each student" received the lowest approval. This indicates that experts support financial aid based on student excellence, requiring follow-up to ensure continued success and prevent waste. This approach is reflected in South Korea's direct training programs with careful spending management.

The Third Pivot: Tripartite Dialogue / Collaborative Financing (Government-Public Sector-Private Sector) and Cost-sharing

The results of this pivot are as follows:

- Approval rates ranged between 59.35% and 100%, indicating broad agreement among respondents.

- The items related to "preparing initiatives to activate investments that suit the nature and specializations of the technical school," "establishing partnerships with investors," "simplifying routine procedures and complexities in systems and regulations," "providing sufficient and accurate information to the investor," "encouraging the private sector to invest in technical education schools," and "investing in the creative ideas of technical education students by establishing partnerships with the private sector" all received 100% approval. This suggests strong support for investing in technical education and activating partnerships with investors. This is consistent with Morocco's experience, where government policies encourage investment, and the private sector plays a significant role in identifying market needs and opportunities.

- The item "free tuition fees" received the lowest approval (59.35%), indicating moderate support. This aligns with the Mendaki Scholarship in Singapore, which provides partial to full tuition coverage for some minority students.

The Fourth Pivot: Self-Financing

The results of this pivot are as follows:

- Approval rates ranged between 81.30% and 100%, indicating broad agreement among respondents.

- The items "reactivating the role of the productive school as a supportive source of funding," "reactivating the units of a special nature in technical schools," "transforming technical schools into productive units/schools through the Permanent Capital Project for Education and Production," "providing good incentives for the units' workers," "organizing a conference to exchange experiences among units of a special nature," and "advertising and promoting the products and services provided by units" all received 100% approval. This suggests strong support for self-financing technical schools.

- The items "encouraging/activating the role of parents' councils to contribute to financing technical education," "the school provides notes and question banks to students in exchange for a financial return," and "the school provides a photocopying service to

students in exchange for a financial return" received the lowest approval (81.30%), indicating a reluctance to burden parents and students with financial obligations.

The Fifth Pivot: Aid-Based Funding/Local Partnerships and International Donors

The results of this pivot are as follows:

- Approval rates ranged between 82.93% and 100%, indicating broad agreement among respondents.
- The items "using technical school workshops for the necessary training to obtain a professional license for technicians" and "financing training centers for training teachers and students" both received 100% approval. This indicates the importance of supporting training centers within technical schools or accrediting them as specialized centers for obtaining professional licenses. This is consistent with Singapore's experience, where industry partners and multinational companies contribute to vocational training, and Vietnam and Japan, where there are joint training programs with foreign partners and significant investor participation.
- The items "establishing students' bank" and "establishing educational funds" received 82.93% approval, reflecting support for creating funds to finance secondary technical education and partnerships for training funds, as seen in England, Spain, and Germany.
- Overall, the responses highlight the importance of diverse financing strategies, including supply-side and demand-side funding, collaborative financing, self-financing, and aid-based funding. These strategies are informed by successful international experiences and emphasize partnerships, careful resource allocation, and support for technical education infrastructure and programs.

The Sixth Pivot: Benefiting from Students' Talents as a Supportive Alternative to Financing the Technical Education

All items of this pivot related to "Investing talented students' ideas in creating instructional aids", "Increasing the awareness of technical school principals of financing plans and talented students' nurturing programs" and "Knowledge gardens/ centers", were approved by (100%).

Discussions/Implications

The data indicates several opportunities and financing alternatives for investment in the technical education sector in Egypt, inspired by international experiences. These alternatives include public-private partnerships, vocational training programs, and the development of specialized technical schools catering to various industries' needs. Each financing alternative has its characteristics and merits.

1. **Supply-Side Funding:** This includes financial investments and interventions targeting the educational system and service providers. It focuses on enhancing the capacity and quality of education by allocating resources directly to the supply and provision of educational services, mostly through government funding, sourced from tax revenues and revenues from various major government projects. This type of funding typically includes measures to improve educational infrastructure, teacher training, curriculum development, and comprehensive institutional support.

2. Demand-Side Financing: This type of funding is provided based on the demand and need for technical education. It involves providing financial resources to individuals or institutions to develop and enhance technical education through scholarships, financing educational projects and programs, or supporting training and professional development for personnel. It aims to activate the demand for technical education and address labor market needs for professional skills and specializations, contributing to economic development and raising professional employment levels.
3. Collaborative Financing (Tripartite Dialogue/Cost-Sharing): This financing method involves the collaboration between the government, public sector, and private sector. Known by different names such as financing based on tripartite dialogue and participatory financing, it includes adopting the public-private partnership (PPP) system, where the private sector invests in educational projects in cooperation with the government, and the Build-Operate-Transfer (BOT) system.
4. Self-financing: This involves transferring the funding relationship from the state to the school, making it a relationship between the school and the student. Educational institutions use their internal resources as a source of funding for their instructional activities and programs. Self-financing is considered an investment, not consumption. Therefore, the productive capacities of technical schools should be exploited and transformed into productive ones, reactivating special nature units in schools, reactivating the role of parents' councils to contribute to financing, and encouraging donations by naming classrooms after donors and supporters of the school.
5. Aid-Based Funding/Local Partnerships and International Donors: This consists of using external funding from countries or international organizations to support educational programs through direct financial grants or specific development projects. It may involve local or international partnerships or financial aid and can include conditional loans such as the World Bank financing for educational projects. The data showed that the last alternative is to benefit from students' talents as a supportive alternative to technical education financing.

Conclusion

This research culminated in devising a proposed concept for financing alternatives for investment in technical education, drawing from international experiences. The goal is to assist decision-makers in developing mechanisms to implement this concept and attract private investments in education, thereby reducing the financial burden on the state. The objectives of the concept include reducing the state's burden by involving various societal categories in financing technical education, managing it, making and taking decisions, and providing the necessary resources to address financing problems. The proposed concept also outlines a philosophy, objectives, foundations, procedures, mechanisms for implementation, and the guarantees necessary for the success of this vision.

There are several requirements to activate this proposed concept, including the need for an executive political decision with an independent administration that is technically and administratively qualified to manage educational investments in technical education schools. It is essential to have legislation and laws that ensure the implementation of educational

investments to provide the necessary funding, similar to some international experiences. Additionally, the availability of sufficient and accurate information for investors about the local market, the availability and regular updating of an investment map for the benefit of investors and encouraging educational media and technical education institutions to engage in investment activities for the benefit of technical schools are crucial. Removing obstacles of the contributions of businessmen in establishing educational institutions is essential to compete and provide distinguished services. This will, also, be more workable through ensuring political, security, and legislative stability, promoting good governance, enhancing transparency, and digital transformation, and choosing appropriate financing alternatives for each type of school individually.

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