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Singapore's Blueprint for Excellence: Crafting a World-Class Education System

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ABSTRACT

This review article explores the remarkable evolution of Singapore's education system, which has been meticulously developed over the past four and a half decades. This system has not only achieved exceptional efficiency but has also garnered global acclaim. A testament to its success is the consistently outstanding performance of Singaporean students in international assessments, in which they frequently outperform their peers from other advanced nations. Singapore's education system is a journey of meticulous crafting from its nascent stages to its current state of excellence. This article examines the various phases of development that have shaped Singapore's educational landscape. A critical aspect of this transformation is the high-quality functioning of educational institutions that are seamlessly integrated into the nation's economic framework. This integration has resulted in an education system that is both compact and robust, thus effectively contributing to Singapore's socioeconomic development. The focal point of this study is the unique administrative and management strategies employed within the Singaporean educational system. These strategies have been instrumental in driving the system towards excellence. The insights presented in this article are drawn from the findings of a 2023 working visit by the administrative delegation of Tashkent State University of Economics to Singapore. Through this visit, the delegation gleaned valuable observations and lessons from Singapore's education model. This article provides a comprehensive analysis of these findings, offering a detailed examination of the elements that constitute Singapore's educational prowess.

Keywords

bilingual education; economic development; educational reform; governance; human capital; Singapore; teacher training

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INTRODUCTION

Evaluation of national educational systems using common criteria suffers from deliberate incompleteness. Using Trends in International Mathematics and Science Study (TIMSS), for example, or counting the number of world-class universities in a given

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country ranked in World University Rankings by Times Higher Education, we always run the risk of missing out on something more important (Dill & Soo, 2005; Kells, 1999; Schuelka, 2013). The purpose of education as a cultural practice is not only to prepare specialists for the labor market and not only to succeed in international tests, but first of all to form a person's personality and pass on through generations a certain amount of cultural experience of a local community or nation (Brameld, 1955; Martin, 1996; Mikus et al., 2020). The value of education in this case lies within the educational practice itself, and the latter should not be evaluated using, for example, market performance criteria. The educational system of each country is unique, since in different countries the education systems pursue different goals to one degree or another (Below et al., 2013; Clark et al., 2023; Morris & Marsh, 1992), and also have their own history of formation and development paths (Hossain, 2022; Kerckhoff, 2001; Savage & O'Connor, 2015), depending on which they acquire unique features (path dependence).

On the other hand, we see an active trend in the internationalization of education. Institutional participants in the educational process often use the metaphor of the market for educational services even in relation to school education (Tarc, 2019; Treshchevsky et al., 2019). Moreover, education systems in the spirit of new managerialism are beginning to be evaluated by states and international agencies using performance criteria more suitable for the private sector (Deem, 1998; Olssen & Peters, 2005). The definition of the modern world economy as based on knowledge suggests that the desire of countries to succeed first of all dictates the need to adapt education to the needs of the current social and economic reality (McGregor, 2009; Okoh, 1980).

Singapore is a country whose educational system is surprisingly isomorphic to both logics. Education in it has strong and even traditional national foundations, but at the same time it is focused on the international labor market and on the training of world-class specialists (Marginson, 2011; Sidhu et al., 2011; Waring, 2014). With the rapid socio-economic development of Singapore over the past decades, education here has remained the most conservative institution (Gardner, 2004), but this institution has managed to successfully adapt to the agricultural and industrial revolutions around the world, to the decline of religious influence, and also adopt new print and audiovisual technologies. There is no doubt that it will respond to the challenges of the modern global economy with no less success, while remaining rooted in national values.

This study aims to examine Singapore's education system as a model of institutional efficiency that integrates nation-building with global economic competitiveness. The study's novelty lies in its synthesis of historical, economic, and cultural dimensions to explain how an education system can simultaneously preserve traditional values and foster innovation. Unlike prior studies that focus narrowly on

outcomes or reforms, this analysis constructs a developmental framework, "Survival," "Efficiency," and "Capabilities Realization" phases, to justify the hypothesis that educational evolution mirrors socio-economic transformation. The scope encompasses Singapore's education policies from 1965 to the present, analyzing their institutional structures, language strategy, teacher training, and governance to identify mechanisms that link education reform with sustainable national development.

The study employs a qualitative-descriptive and comparative-historical approach grounded in documentary analysis. It integrates primary sources, such as reports by the Singapore Ministry of Education and other institutions, with secondary analyses from scholarly literature. Data are interpreted inductively to trace institutional logic, policy sequencing, and outcomes across reform phases. The article's structure unfolds as follows: an introduction situating the theoretical problem; historical evolution of the system; analysis of each reform phase; institutional and governance mechanisms including teacher training and management; followed by an integrated discussion and conclusion highlighting the model's implications for global education policy transfer.

The History of the Development of the Education System in Singapore

For experts in the field of education, Singapore is interesting at least because the education system in this country is rated as one of the best in the world (Alishev & Gilmutdinov, 2013). According to the Progress in International Reading Literacy Study (PIRLS) study, the level of functional literacy of the population of Singapore is one of the highest in the world (Mullis et al., 2023). Furthermore, Singaporean schoolchildren have shown the best results in the world in comparative international tests of knowledge of mathematics and natural sciences (TIMSS) since 1995 (Von Davier et al., 2024). Singapore's educational system is also considered among the best to adapt to the requirements of the global economy (Dimmock & Tan, 2016; Sharpe & Gopinathan, 2002). In order to understand how the Singaporean education system has been able to cope so successfully with the challenges of a changing institutional environment, it is necessary to turn to the history of its creation and development.

Singapore, unlike other Asian states, which often have a thousand-year history, is an extremely young nation. In 1819, the East India Company, which traded almost all over the world, decided to build a small port in the desert Malaysian territory. The founder of the village was the British officer Sir Thomas Stamford Raffles, thanks to whose efforts by 1825 Singapore turned into a bustling and business port city. For more than a century, Singapore was a colonial possession of the British Empire. Under the rule of the English crown, the city actively developed until the start of World War II. In 1942, it was captured by Japan and was occupied for 3.5 years. After the withdrawal of Japanese troops in 1945, the people of Singapore began to fight against the colonial

status of the territory. In 1959 Great Britain granted independence to the country (Goh & Gopinathan, 2008b).

Singapore has always been closely associated with Malaysia, as it depended on it for the supply of water, food and almost all other resources. Since the domestic market was small, it was impossible to implement a full-fledged import substitution strategy. Nevertheless, an attempt to unite with Malaysia for Singapore was unsuccessful. The reason for this was the ethnic composition of the country: 70% of Singapore's population were Chinese, 15% were Indians, and only 10% were Malays. At the same time, the population of the country grew rapidly: in 1948 it was 960 thousand people, in 1954 it was already 1.6 million. Unemployment also rose, while the colonial government was not interested in creating new jobs. In 1966, the first year of the independent existence of the state, it jumped to 9.2% (Goh & Gopinathan, 2008b).

One of the critical problems was that by 1959 there was no single and integrated nation: the main ethnic groups considered themselves Chinese, Malays, Indians, but not Singaporeans. As a result, there was no active and initiative group of the population - citizens who could take responsibility for the future of the country. This situation was also reflected in the system, or rather, the multinational education systems that coexisted in parallel in Singapore (Y. T. Chia, 2011; Wong, 2005, 2006).

The British colonial government never specifically dealt with their structuring, and therefore, along with English schools, which mainly taught children of the military, Europeans and wealthy local residents, national (vernacular) schools developed, in which education was conducted in their native language. Obviously, Chinese schools dominated, graduates of which, without a good knowledge of English, did not have serious prospects for higher education, and they did not have a chance to take up positions in the civil service. In other words, the existing state did not perceive the Chinese majority as an active force capable of becoming the basis of the Singaporean community. This power was simply not in demand (Sanderson, 1962; Venkateswaran, 2007; Windhausen, 1964).

Singapore became completely independent in 1965, and at this stage 45 years ago it had neither a single educational system, nor an army, nor a navy, nor what could be called a nation. Moreover, the country had practically no resources for development. The main industries were shipbuilding and ship repair. Industrial production in 1960 was no more than 12% of GDP. One could only count on the successful location of the state at the intersection of the world's most active trade routes, the third deepest port on the globe and human capital. It was the choice by the country's government of the last factor as the locomotive of economic and social development that predetermined the success of the future nation (Ab Kadir, 2019; Chou, 2021; V. Chua et al., 2019).

After gaining sovereignty, the elite of Singapore began to look for ways to develop a new state. Since the country did not have the natural resources necessary for accelerated industrialization, the government chose the path of intellectual modernization associated with the creation of a market for highly qualified personnel to attract foreign investment and the formation of an export-oriented economy. It was at this stage that a special nature of the relationship between the economic and educational sectors of the country took shape. The latter was originally aimed at creating conditions for the education and training of competitive professionals who are able to adapt to various living and cultural conditions. Institutionally, the logic of economic reality was extended to education, it was demanded of efficiency and accountability (Alam, 2015; Rodan, 1989).

Education had to perform another important function: the function of uniting the nation, creating a common idea of citizenship (what does it mean to be a Singaporean?) and reaching a consensus on basic values (Ji & Zhang, 2023; Wang, 1978; Zajda, 2009). Propaganda campaigns were carried out in the country, during which the political survival and economic success of Singapore were associated in the public mind with the adoption by its citizens of completely new social attitudes. The category of "national interest" was formulated, the submission to which one's personal aspirations was proclaimed the greatest virtue. As part of the educational process, the logics of economic and political expediency merged. The author now turns to the periods of development of the education system in Singapore identified by experts.

Survival Phase (1965–1978)

In order to implement the strategic plans of the government in the absence of natural resources, it was necessary to develop human capital. The educational system was faced with the task of giving the country a technically educated and competent workforce. It is important to emphasize that if during British rule in the education system, the goals of a local and ethnic nature, issues of cultural reproduction came to the fore, now the government of Singapore put economic interests and efficiency at the forefront (Comunian & Ooi, 2016; Schulze & Kleibert, 2021).

In the context of the coexistence of several national educational structures, it was necessary to optimize them and bring them to a single standard. The government abandoned the development of a complex policy of convergence and did not attempt to unite the school systems of different ethnic groups, primarily English and Chinese. The choice was made in favor of a single language of teaching for all subjects, it became English 2, with a special emphasis on the study of the native language. At first, this decision provoked protests from the Chinese majority, since the English language was steadily associated with the colonial past. Therefore, the state combined a tough

policy of bringing education to a single standard with the conviction of various ethnic groups that their native language would also be studied and measures would be taken to preserve their cultural identity (Curdt-Christiansen, 2016; Dixon, 2005; Jain & Wee, 2019).

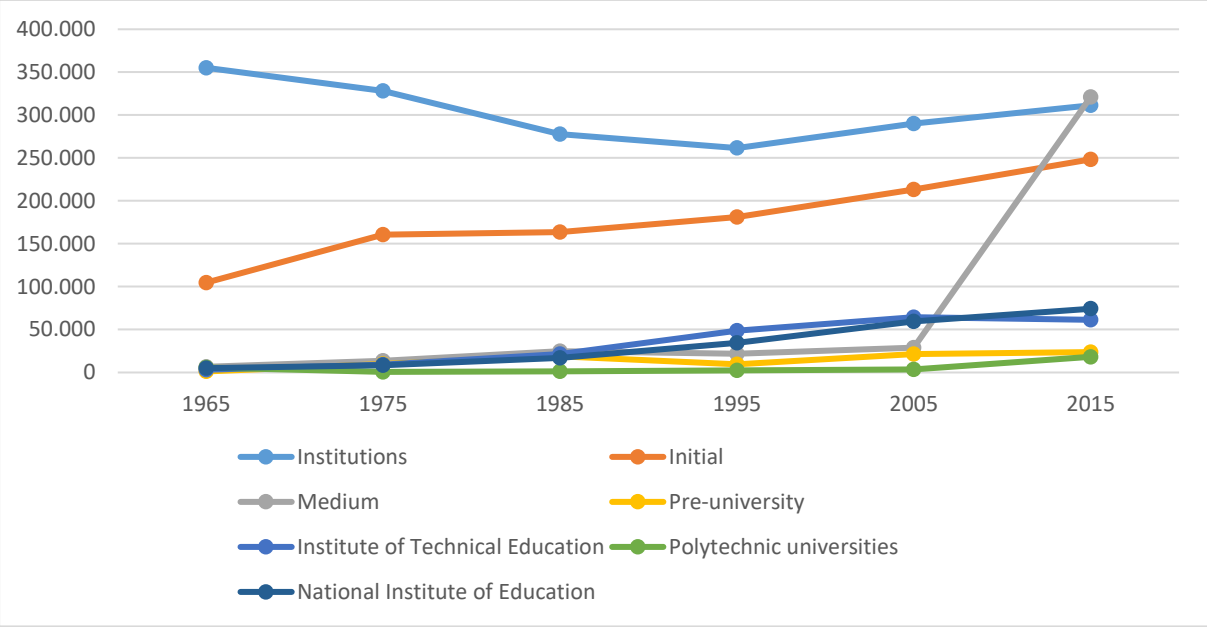
The choice in favor of bilingualism, in addition to cultural and political grounds, also had a pragmatic background. The establishment of an export-oriented economic model required a trained workforce capable of negotiating and quickly adapting to cultural conditions in all corners of the world. At the same time, when sending their children to school, parents had to be sure that they would not be brought up with a disdainful attitude towards their native culture and that they would learn their native language. Bilingualism, which has now developed into a well-functioning system of language training for all citizens without exception, allows Singapore to combine the western direction with the eastern one in its international industrial, trade and educational policy. So, if in Europe and North America they usually study their native language and another European language, then in Singapore they study English, which is a means of communication in international business, and Chinese, which is a lingua franca for Asian businessmen (S. K. C. Chua, 2010, 2011).

After gaining independence, Singapore adopted a five-year program for the development of education (1961-1965). Priority was given to the creation of a system of universal and free primary education. The philosophy of this phase was summarized in the final report of the Ministry of Education of Singapore: “We are committed to maintaining the same opportunities for citizens, to creating conditions for maintaining unity in diversity, and to forming a long-term program to prepare a new generation for the needs of a modern industrialized and technological society" (Goh & Gopinathan, 2008b).

Although compulsory primary education in English schools was not enshrined in law, the parents of Singaporean children turned out to be extremely pragmatic. If in 1959 only 47% of all children went to a 6-year primary English school, then 20 years later, in 1979, 91% of children studied in English schools, and only 9% attended Chinese schools. Such behavior can be interpreted as a free choice of rational parents who were placed in a situation with a well-thought-out system of incentives (Curdt-Christiansen, 2016).

Figure 1

Dynamics of the Number of Students in Educational Institutions in Singapore in 1965-2015



Source: Ministry of Education Singapore (2023).

The total number of students in the country was growing (Figure 1), which required serious capital investments in the educational infrastructure (Table 1). From 1959 to 1966, 83 new schools were built, about one school every month for seven years, an impressive pace for a small city-state.

At this stage, the educational sector of Singapore was fully financed from the state budget, private investment was practically not attracted. The Ministry of Education formed an annual cost estimate and submitted it to the Ministry of Finance, then it was considered and approved in the parliament of the republic.

Table 1

Dynamics of Education Funding in Singapore (Thousands SGD)

Type of Cost	1965	1975	1985	1995	2005
Total	130,211	391,264	1,775,580	3,443,857	6,102,849
Current expenditures	112,805	339,870	1,388,325	2,682,419	5,223,588
Elementary education	65,144	129,351	422,806	694,703	1,148,491
Secondary and pre-university education	24,923	88,900	431,866	831,401	1,591,752
Institute of Technical Education	2,822	43,243	80,294	109,670	203,992
Polytechnic universities	2,400	12,330	110,434	338,960	624,794
National Institute of Education	1,999	6,487	22,979	40,922	85,641
Higher education (general)	10,337	41,048	253,811	520,289	1,012,860
Other educational institutions	5,180	18,511	66,135	146,474	566,058
Miscellaneous educational expenditures	17,406	51,394	387,255	761,438	869,261

Source: Ministry of Education Singapore (2023).

At the first stage, problems arose with the provision of educational literature for all schoolchildren. Prior to independence, Singapore used textbooks published in countries native to various ethnic groups. However, these textbooks contained constant references to cultural norms and values alien to Singapore as a single nation. This situation was perceived by the government as a serious threat to the process of formation of the national identity of young citizens. In addition, imported textbooks were very expensive and inaccessible to most of the country's population. Therefore, starting from 1967, the government seriously attended to the creation of a national infrastructure for the publication of educational literature. A specialized bureau was organized under the Ministry of Education, and the implementation of the "Textbook for Everyone" program began (Blackburn & Wu, 2019; He & Zhao, 2022).

The second important task was to provide schools with a sufficient number of qualified teachers. As well as the number of students, the number of teachers steadily increased: from 10,603 in 1960 to 18,661 in 1970. To cope with the shortage of teachers, the Ministry of Education had to recruit teachers in schools massively, studying at the Teacher Training College. During this period, evening teacher training programs became widespread. The heavy workload that fell on teachers in connection with the need to combine study and teaching at school six days a week had a negative impact on the quality of school education and the general morale of teachers. The college itself also could not maintain a high level of training due to the large flow of teachers. The situation stabilized only by 1970, when the shortage of personnel was generally overcome (Gopinathan & Loh, 2024; Loh & Hu, 2019; Stewart, 2010b).

At the stage of development of the educational system of Singapore, which experts call the period of survival, special emphasis was placed on technical and vocational education. In 1964, the government, sensing a serious shortage of blue-collar workers, created the first vocational schools. They were sent to schoolchildren who, due to low academic performance in the final exam after completing a 6-year primary school, could not continue their education in an academic secondary school. The curriculum of the school has been specifically designed to provide children with skills that, after acquiring them, could immediately find employment in industrial and other commercial organizations (Abu Bakar et al., 2020; Nowosad, 2022; Varaprasad, 2022).

It soon became clear that there were extremely few students receiving technical education: in 1968, out of 144,000 primary school graduates, only 18,000 entered vocational schools. Therefore, since 1969, all schoolchildren in the first two years of study at secondary school were offered to receive parallel technical education. At the same time, technical institutes were created that accepted secondary school graduates. Already by 1976, up to 20% of school graduates received technical education. the

number of teachers in vocational education institutions increased from 425 in 1968 to 1950 in 1972 (Goh & Gopinathan, 2008a).

By the end of the 1970s, the publication of national textbooks for schools was established in Singapore, professional training of teachers was organized, a system of technical education for young people was created, thereby completing the survival stage in the history of the country's educational system. By the time it ended, a number of problems had become apparent (Goh & Gopinathan, 2008a).

First, the Singapore Ministry of Education did not recognize the need to adapt language teaching to the abilities of the students in time. Because of this, the level of language training was extremely heterogeneous even within the same school class. Since all subjects at the school were taught in English, insufficient knowledge of the language made it difficult to master other subjects. In the 1970s, only 40% of schoolchildren received a satisfactory score in English at the end of high school (Goh & Gopinathan, 2008a).

Secondly, it became necessary to differentiate teaching depending on the abilities and needs of students. Thus, about 30% of children who graduated from primary school, according to the results of the exams, did not meet the requirements that education in secondary school presented. Less than half of these 30% went on to enter vocational schools and institutes. Out of 1,000 pupils entering primary school, 206 left school after grade 9 without any vocational qualification. In addition, less than half of the schoolchildren during this period took a secondary school course without duplicating classes (Goh & Gopinathan, 2008a).

Thirdly, the feedback between the ministry and educational institutions was insufficient. The Ministry rarely consulted with schools when developing and implementing certain programs. The indifference of the ministry to the opinion of the school led to a decrease in the social status of educational institutions and the people working in them. This policy caused a backlash: mass layoffs of teachers of their own free will began. Teachers who continued to work lost motivation for professional growth and success in teaching schoolchildren (Goh & Gopinathan, 2008a).

Fourth, there was a shortage of qualified teachers in the field of vocational education. Many went to more attractive jobs in rapidly developing industrial enterprises. In 1971, the British naval base was withdrawn from Singapore. The country was left by the military and their families, who formed a pool of highly skilled labor in the labor market. Between 1970 and 1975, there was a shortage of 450-500 engineers a year (Goh & Gopinathan, 2008a).

Efficiency Phase (1978–1997)

By 1980, the share of the industrial sector in the country's GDP was 28%, which was a significant increase compared to 12% in 1968. However, new challenges also appeared. More and more Asian countries began to compete with Singapore in industries that require intensive labor of low-skilled personnel. The Singapore government has begun to formulate a new strategy for moving from a league of labor-intensive industries to a group of predominantly capital-intensive countries (S. Y. Chia, 2005; Powers, 2019; Teo & Ang, 2001).

Thanks to two decades of extensive development of the educational system, the younger generation of Singaporeans was fully covered by primary and secondary education. Now it was necessary to shift the emphasis from quantitative indicators to qualitative indicators. The educational system of Singapore was created on the basis of the assumption that all children are equal in terms of ability and readiness for learning. However, as practice has shown, focusing on the average child in the learning process leads to the fact that the most capable children are bored, having already mastered the material, their activity decreases, while the least capable do not keep up with their peers, and this gap persists throughout school life (Ng, 2008; Yue, 2024).

In order to increase the efficiency of the educational process, a new educational system was adopted in 1979. It envisaged the introduction of streaming education in primary and secondary schools, which allowed children to move up the educational ladder in accordance with their abilities. The main purpose of the introduction of flows was to provide every child with the opportunity to graduate from high school and thereby gain basic knowledge for further vocational training and employment. Another direction of the reform was to increase the social status of teachers, as well as the introduction of continuous and systematic advanced training for teachers and school principals (Chiong & Dimmock, 2020; Deng & Gopinathan, 2016; Liu et al., 2005).

The results of the introduction of the new educational system were impressive. First of all, they showed up in school exams. If earlier about 60% of students in both primary and secondary schools failed exams in English and their native language, then in 1984 success in the exams was accompanied by almost 90% of schoolchildren. Dropout rates from secondary school have decreased. In 1986, less than 1% of children left school without having received a full 10-year education (Deng & Gopinathan, 2016; Yasinian, 2018).

It was not so easy to overcome the problems associated with the rigid and authoritarian approach of the Ministry of Education to planning the activities of the educational system, with restrictions on the dissemination of information and enforcement of decisions taken as manifestations of the paternalistic style of management that was characteristic of the government at that time. the government

of Singapore as a whole. The lack of feedback from schools created great difficulties (Goh & Gopinathan, 2008a). First, a conciliatory position from below was cultivated. Many instructions were accepted for execution without extensive discussion and expert evaluation. Secondly, school principals avoided making important decisions here and now, and waited for instructions from above. Thirdly, the educational system was extremely dependent and required constant "manual" control. There was an acute shortage of initiative personnel capable of acting autonomously. The employees of the educational system did not strive for dedication and did not feel responsible for the implementation of the decisions made by the Ministry. In the mid-1980s, most school principals and teachers were not staunch supporters of top-down reforms because they felt alienated from their planning and design.

From 1985 to 1991, the government of Singapore carried out a series of reforms aimed at improving educational planning, increasing its efficiency, and increasing the autonomy and flexibility of the school system. Serious changes have been made in the field of vocational education. Traditionally, vocational education in Singapore has been provided to the poorest and the least academically capable groups of the population. There was a stereotype in society that vocational education was the lot of losers, those who were not successful in school. The formation of the stereotype was also facilitated by Confucian culture, which for centuries formed the image of an educated person as a government official or administrative (office) employee. Not a single parent wished for their child a future simple worker. Such a system of values, widespread in society, limited Singapore's opportunities for economic development (Chong, 2014; Varaprasad, 2022).

The Ministry of Education has implemented a number of measures to increase the prestige of vocational education. First, the Institute of Technical Education was created in 1992 from disparate institutions of vocational education, built according to the campus system. Several buildings of the institute were erected throughout the island, equipped with educational and sports infrastructure. The most advanced technological developments were used in equipping the educational laboratories. Studying at the institute became comfortable and pleasant. Secondly, the academic requirements for applicants to the Institute of Technical Education were significantly increased. Beginning in 1992, a special technical stream was introduced in secondary schools, to which students were transferred who did not do well enough in the final exam in elementary school. In this stream, more time was devoted to teaching English and improving the technical skills of schoolchildren, and graduates had the right to enter the Institute of Technical Education. Since 1994, the institute introduced a career guidance program: schoolchildren were introduced to the campus, the learning process, and their future profession (Goh & Gopinathan, 2008a).

Due to the shortage of qualified technical personnel in the labor market, their average salary increased significantly: from 700 SGD per month in 1994 to 1200 SGD in 2005. Marketing technologies were used to popularize technical specialties, in the mass media actively disseminated "success stories" of graduates of the Institute of Technical Education. The result was a significant influx of students (see Table 1). Building a high-tech economy required a large number of scientists and engineers with higher education. However, in the early 1980s, only 9% of the country's school graduates entered higher education institutions. Expansion of citizens' access to university education was hampered by strict criteria for selecting university applicants. A number of steps have been taken, including raising starting salaries, to attract young Singaporeans to the research and engineering professions. The result was a doubling of the number of engineers with higher education by 1989 compared with the beginning of the decade. Another policy direction was the active involvement of girls in enrolling in technical specialties in universities: many of them showed much higher results in final exams than boys, but considered technical specialties "unwomanly business" (Goh & Gopinathan, 2008a).

Capabilities Realization Phase (1997-present)

Singapore's inclusion in the global knowledge-based economy required the creation of a national innovation infrastructure. In education, it was necessary to shift the emphasis from the production and procedural logic of efficiency to something that was very difficult to measure - to the mechanisms of the generation and development of ideas. By 1995, Singapore's educational system was producing a really high quality product. Young Singaporeans excelled in international tests in mathematics and science. In 1995 and 1999 they were the best in the TIMSS tests. At the same time, realizing the challenges of today, the Ministry of Education began to call for a transition from the paradigm of efficiency to the paradigm of realizing existing opportunities. In June 1997, this idea was presented as part of the Smart Schools, Educated Nation program, which directly linked the future of the city-state to the ability of its citizens to learn, and to do so throughout their lives. In the 21st century the quality of education is a critical factor for the survival and prosperity of the nation, it determines the level of national wealth (Dimmock & Goh, 2011; Koh, 2002; Tee, 2004).

At the present stage, Singapore has adopted ten years of schooling, including six years of primary, during which children can participate in a wide variety of educational programs. At this stage, students are provided with a wide range of educational opportunities, thereby adapting the system to the needs of each child. In 2004–2008 there was a gradual abolition of streaming education in primary school, now individual training programs are made up of combinations of those subjects that students study

at their own choice and on the recommendation of the school. The Ministry of Education concluded that grouping children by ability at an early age does not improve academic achievement, but rather reduces motivation to learn and leads to stagnation. At the stage of secondary education, while formally maintaining flows, the flexibility of the system was increased: schoolchildren were given the opportunity to change the direction of study in the event of a change in their academic performance. Particular attention in the educational process is paid to the subjects of the natural science cycle, mathematics and language training. However, students are involved in learning not only in the classroom (Kaur, 2019; Kaur & Leong, 2021; Y.-J. Lee & Ho, 2024; Yeo & Tan, 2021).

A large amount of time at school is devoted to additional activities related to the implementation of any projects, sports, creativity, etc. The entire educational process is aimed at educating leaders open to the world who are able to work in a team. Formally, the average class size in a Singaporean school is 40 people. However, looking closely at the course of a real lesson, one can notice that in the process of teaching the teacher interacts more with eight groups of five people. In each group there is a process of communication, learning, work and formation of the child's personality (Redpath, 2008).

The main goal of the current stage of development of the educational system in Singapore is to create a stimulating environment that would motivate every person to learn throughout life, gain new knowledge and skills, master technology, develop the spirit of innovation and entrepreneurship, and be able to take risks. and take responsibility and responsibility. The essence of the stage can be briefly described as the creation of institutional mechanisms for identifying and developing the abilities and talents of the child at each stage of school education. In order to promote a variety of educational opportunities, the government has developed the “Edusave” incentive grant scheme, which allows students to cover the costs associated with education, including the cost of additional education and travel abroad. To support the scheme, the ministry created a $5 billion endowment.

At this stage, the plan to provide schools with ICT equipment also began to be implemented. 2 billion SGD was spent for this purpose from 1997 to 2002, during the implementation of the first five-year master plan. As a result, computers now transmit 30% of the total curriculum. It was followed by the second and third five-year master plans, which involve the further spread of digital technologies, but at the same time bring to the fore the integration into a single system of the curriculum, mechanisms for assessing knowledge, education, vocational training and providing each child opportunities to study the culture of their people (Natarajan et al., 2021; Natarajan & Laxman, 2021; S. C. Tan et al., 2017a, 2017b, 2017c).

School Management in Singapore

The Ministry of Education is the main actor in the field of school education. All public schools report directly to him, and all teachers are civil servants. In total, there are 354 schools in Singapore with about 521,600 students. Administratively, Singapore is divided into four educational districts. Each district has seven school clusters, which are managed by superintendents. Each cluster has 12 to 14 primary and secondary schools (Redpath, 2008). Schools within the cluster compete with each other for additional funding for the development of any projects or in-depth specializations. At the same time, schools, especially those located close to each other, often help each other, share infrastructure and form a kind of centers for the collective use of sports facilities, laboratories, and sophisticated educational equipment (Y.-J. Lee & Ho, 2024).

Cluster superintendents supervise the activities of school principals. In their hands is the distribution of funding. Nevertheless, school principals have significant autonomy, which increases if the school is given autonomous status based on the results of its activities. In particular, schools acquire additional rights in the selection of personnel, financial activities and building the educational process (Dimmock & Tan, 2016).

The Singapore Ministry of Education sets a goal, and generously funds its implementation, for schools to develop one or another specialization in education, in the area in which the school excels. Depending on the internal capabilities, the school itself chooses its own niche and justifies the reality of its development before the superintendent and the ministry. After the program is approved, it receives additional resources and becomes the center for the development of best practices in the chosen area in this cluster. All schools in the cluster can use its resources by agreement. The Ministry of Education oversees this process to ensure that specialty schools are evenly distributed across all clusters and that a variety of specializations flourish in each cluster (Dimmock, 2011; Y.-J. Lee & Ho, 2024; Mok, 2003).

Institutional Arrangements for Teacher Training in Singapore

The Singapore Ministry of Education in its policy proceeds from the belief that the quality of teaching directly depends on the qualifications of teachers and that it is more efficient to invest in a compact system of teacher training than to solve the problem of the quality of teaching "manually" within the framework of the actual educational process. The selection and training process for teachers in Singapore is long and complicated, but it ensures that the teachers are truly the best of the best (Bautista et al., 2015; Liu, 2023; Loh & Hu, 2019; Stewart, 2010a).

The monopoly in teacher training in the city-state is the National Institute of Education, established in 1991 and based at the Nanyang Technological University. Only he has the right to train specialists for teaching positions and, in agreement with the

Ministry of Education, send them to work in schools in Singapore. In addition, the institute conducts active research work to summarize and analyze the best pedagogical practices around the world. In 2002, the Ministry of Education allocated SGD 48 million to establish and develop a center for research in pedagogical theory and practice. this center has become the basis for peer review of many educational reform programs in Singapore, as well as the peculiarities of the educational process and simply controversial situations that are developing in schools and in the classroom (Bautista et al., 2015; Liu, 2023; Loh & Hu, 2019; Stewart, 2010a).

Before applying to study at the National Institute of Education, the candidate must spend at least five weeks at the school to become familiar with its activities. He usually works as a teacher's assistant or an ordinary administrator, and at the same time he is paid a minimum allowance. After the internship is completed, the principal and the cluster superintendent evaluate the potential candidate. In the case of a positive conclusion, the future teacher enters the first stage of selection, which consists in assessing the candidate's resume (Redpath, 2008). The minimum qualification requirements stipulate that the applicant must be in the top 30% of the academic rankings in their age group, have a pre-university or higher education corresponding to the direction of the desired teaching activity, and must also prove their interest in children, teaching and the teaching profession generally. It should be noted that preference is given to those candidates who already have higher education in the field of their intended specialization.

At the second stage of selection, the candidate passes functional tests and literacy assessment. The third stage is an interview: a group of three experienced experts evaluates the psychological attitudes and personal qualities of the candidate. this stage may include practical tests and verification of teaching activity. In the process of education at the National Institute of Education, the fourth stage of selection is implemented. The achievements of prospective teachers are monitored during their initial training, and candidates who do not meet the standards are excluded from the educational program.

On average, one out of six applicants manages to overcome all stages of selection. The term of study at the National Institute of Education is one year for a specialization and three years for a bachelor's degree. All this time, the student is paid a scholarship, which is not much less than his future starting salary (Table 2). The state concludes a contract with future teachers, according to which they undertake to work at the school for three years after graduation. Otherwise, they will have to reimburse the state for all the costs of their education. However, in practice, such cases are extremely rare, as the state makes every effort to keep teachers in school.

The salaries of school teachers are quite competitive, at the level of the average salary in the country. Bonuses and allowances are constantly accrued depending on the effectiveness of teaching activities and additional professional training. The latter largely determines the level of teachers' salaries. School teachers often build entire portfolios of continuing education and professional development courses. Each teacher is fully paid for 100 hours of professional development per year. As a result, teachers' salaries vary quite significantly and depend on their additional activity. It often happens that teachers who spend a lot of time in the classroom with students receive less than those who constantly travel and improve their skills.

Table 2

Starting Salaries for Teachers in Singapore (in SGD)

Before and during training at the National Institute of Education		
Diploma Type	**After Military Service**	**No Military Service**
Ordinary Degree	2,472	2,822
Honors Degree	2,647–2,822	2,997–3,172
After graduating from the National Institute of Education		
Diploma Type	**After Military Service**	**No Military Service**
Ordinary Degree	2,585	2,939
Honors Degree	2,762–2,939	3,115–3,292

Source: Ministry of Education Singapore (2008).

Generally, teachers in Singapore retire between the ages of 60 and 62, although there is no age limit for teaching. At the same time, the average age of teachers is 34 years (Redpath, 2008).

After graduating from the National Institute of Education, the typical Singaporean teacher returns many times throughout his career for continuing education courses. In the process of receiving additional education, teachers are divided into three groups (Bautista et al., 2015; Sclafani, 2015):

- teaching - for those who want to devote their entire career to school and take on additional obligations within the school or school cluster, conducting trainings, mentoring young teachers;
- specialty — for those who want to work in the Ministry of Education, develop and implement educational policy, formulate educational standards;
- leadership — for those who plan to continue their careers as heads of cycle commissions, head teachers or principals.

Each direction has its own training system, including specialized practical and theoretical courses. However, the system is flexible, teachers can move through streams (it often happens that a school teacher goes to work in the ministry for some time, thereby gaining experience in developing programs in the field of education, and

then returns to the level of deputy director or director of the school). According to the general rule, distribution by streams is carried out based on the results of interviews conducted by line managers and based on the monitoring data of objective performance indicators. A strict scoring system has been developed to evaluate the interview results (Chew, 2015; A.-L. Tan, 2018; Xia, 2020).

However, the developed system of advanced training of teachers leads to the fact that they are often absent from schools. For example, a school deputy principal can take leadership courses for six months in a row, and the Ministry of Education grants him leave for this period. Teachers often travel outside the country for several weeks on various programs. In this regard, there is a permanent shortage of teachers (Chew, 2015; A.-L. Tan, 2018; Xia, 2020).

Nevertheless, the Ministry of Education considers the continuous professional development of teachers as its most important task. School teachers are provided with a voluminous social package, including social and medical insurance, pension provision, and special savings schemes. There is also a seniority mechanism: teachers who have worked at the school for a certain time are provided with additional payments and financial support. Thus, the ministry's policy is aimed at retaining trained teachers in the educational field and maximizing the use of the experience of highly qualified teachers of the older generation (Chew, 2015; A.-L. Tan, 2018; Xia, 2020).

Factors Behind Singapore's Success in Establishing and Reforming the Education System

The creators of the education system of Singapore and its reformers themselves note that their policy was not always clearly calibrated and had a beneficial effect on the state of Singaporean society. However, in general, despite the fact that in the process of creating and transforming the educational system, many reform programs were abandoned as quickly as they were developed, the main goal of educational policy was unchanged: all young Singaporeans, regardless of race, language, gender howl and religious affiliation, must be educated. For decades, the educational system has adapted to the changing needs of the national and world economies, but at the same time remained faithful to the civic and moral values that are the main thing for the country. The author formulates the main reasons that, in our opinion, allowed Singapore to achieve a high level of institutional efficiency in the field of education.

Singapore at the stage of gaining independence in 1965 was in a unique situation: the country did not have a universal educational system. this circumstance can be regarded as a big disadvantage, but it can be treated as a boon and use the opportunity to construct an education system from scratch that would meet the current

needs of the world economy, without a history of failure. For the institutional design of the education system, the world's best experts were involved.

Singapore is a country that is easy to manage. Small in size, with a high but uniform population density, and a convenient geographic location, it is an ideal field for integrated planning. The subordination of all educational institutions to a single body - the Ministry of Education - significantly reduced the costs of implementing and managing reforms and increased their effectiveness. The Ministry of Education is a universal body coordinating processes in the entire field of education in the country.

The adoption of English as the main language of instruction in schools and the language of international communication now, 45 years later, can be assessed as a very far-sighted step. It made it possible to use the best Anglo-Saxon teaching practices, and most importantly, the world's intellectual capital and expertise. Academic exchanges and cross-fertilization of the best ideas with the Western world became possible. At the same time, the preservation and study of the languages of different ethnic groups in schools makes it possible to develop cultural and economic ties with the Asian world, and, consequently, to take advantage of the opportunities for its rapid growth.

Singapore over the past 45 years has avoided serious socio-political and economic conflicts. A stable, but at the same time dynamic system has emerged that functions effectively with minimal costs. Positive and successful experiences always support and reproduce themselves. Past successes in reforming education shape the expectations of future success and citizens' trust in the state, its actions and proposed reforms are assessed by society as effective and reasonable.

The Singapore government has managed to create an image of the educational system as one of the most innovative and prestigious areas in which it is interesting to work and study comfortably. The development of education has become a kind of national project, in which all citizens were involved, and the government provided it with maximum support, thereby increasing its value in the eyes of the population (Gopinathan & Lee, 2011; Hairon, 2022; Schuelka, 2013).

Competition is the principle and guiding mechanism of activity in the educational system of Singapore. It played a generally positive role, allowing the development of clear and objective indicators of the performance of the school director, teacher, student, education official. The indicators that need to be achieved in order, for example, to receive a promotion or a bonus at the end of the year, have become clear. Thus, along with the goal of “being successful”, which is set by popular culture for every citizen of Singapore, understandable criteria for success have been developed that offer transparent and clear ways to achieve this goal (Chiong & Dimmock, 2020; Chykharina, 2023).

The serious attitude of Singaporeans to moral values and the absence of cynicism are the basis of institutional transformations in the education system (Kuzminov et al., 2005). Singaporean citizenship is originally based on the Confucian ideas of paternalism, submission and diligence (discipline). There is no cynicism towards these values in relation to modern citizens of the country, the mass media disseminate success stories with diligent and disciplined study and work, which become an example to follow.

CONCLUSION

The comprehensive analysis of Singapore's educational system, as presented in this article, provides a multifaceted perspective on the transformative journey of one of the world's most acclaimed educational models. This system, evolving through various phases - from survival to efficiency and then to the realization of capabilities - has adeptly balanced the traditional values of a young nation with the exigencies of a globalized economic landscape. Singapore's education story is unique, not merely due to its remarkable adaptation and growth but also because it demonstrates an effective integration of national identity with global competitiveness.

From its inception during Singapore's early post-independence days, the education system was pivotal in nation-building and fostering a sense of Singaporean identity. It faced the daunting task of unifying a diverse population and transforming a resource-scarce nation into a hub of intellectual modernization. The system's evolution from focusing on technical and vocational education to prioritizing a knowledge-based economy illustrates Singapore's strategic approach to education, tailoring it to meet the dynamic demands of the global economy while preserving its cultural ethos.

The Singaporean model underscores the importance of strategic planning in education, where significant investment in human capital has been a key driver of the country's socio-economic success. The implementation of bilingual education, the emphasis on teacher training and professional development, and the integration of information and communications technology in education are hallmarks of this system. These elements not only reflect the adaptability and forward-thinking approach of Singapore's education policy but also highlight the critical role of education in national development.

Singapore's education system exemplifies a successful blend of cultural preservation and global orientation. It stands as a testament to the transformative power of education in national development, offering valuable lessons for other nations. The Singaporean experience demonstrates that a well-planned, adaptable, and culturally rooted education system can be a vital instrument in a nation's journey

towards economic and social prosperity, aligning with both national aspirations and global standards.

Author Contributions

Conceptualization: J.S.; Data curation: J.S.; Formal analysis: J.S.; Funding acquisition: J.S.; Investigation: J.S.; Methodology: J.S.; Project administration: J.S.; Resources: J.S.; Software: J.S.; Supervision: J.S.; Validation: J.S.; Visualization: J.S.; Writing – original draft: J.S.; Writing – review & editing: J.S. The author has read and agreed to the published version of the manuscript.

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Informed consent was not required for this study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Conflicts of Interest

The authors declare no conflicts of interest.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work the author used ChatGPT, Grammarly, and PaperPal to improve clarity of the language and readability of the article. After using these tools, the author reviewed and edited the content as needed and took full responsibility for the content of the published article.

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