Comparative Analysis of Two Educational Systems in Both Basic and Higher Education between Japan and Singapore

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The comparative analysis of the educational systems in Japan and Singapore, encompassing both basic and higher education, reveals intriguing insights into the diverse approaches employed by these nations. In terms of basic education structure, Japan follows a 6-3-3 system, comprising six years of elementary education, three years of junior high, and three years of senior high, while Singapore adopts a 4-4-4 system, dividing education into four years each of primary, secondary, and pre-university or vocational education. This structural contrast sets the stage for examining curriculum, instructional methods, assessment practices, teacher training, funding mechanisms, equity considerations, and educational outcomes. Japan's emphasis on national standards and rote learning is juxtaposed against Singapore's focus on critical thinking, problem-solving, and creativity, reflecting varied pedagogical philosophies. Instructional methods further differ, with Japan relying on

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traditional teacher-centered approaches and Singapore embracing diverse strategies like project-based and collaborative learning. Assessment practices showcase Japan's reliance on standardized national exams, while Singapore employs diverse methods such as internal exams and portfolios. In teacher training, Japan emphasizes subject knowledge and standardized training, while Singapore prioritizes pedagogical skills, continuous professional development, and career progression. The funding landscape diverges, with Japan primarily relying on public funding and limited private involvement, while Singapore fosters a robust public-private partnership for funding and innovation. Equity and access priorities also differ, with Japan expressing concerns about rural-urban disparities, and Singapore emphasizing equal access for all students. Notably, both nations achieve high PISA scores, but Japan grapples with concerns about rote learning and student stress, whereas Singapore excels in international benchmarks. This comparative analysis underscores the nuanced and multifaceted nature of educational systems, providing valuable insights for policymakers, educators, and researchers seeking to understand and learn from the diverse approaches adopted by Japan and Singapore.

1. INTRODUCTION

1.1 Background of the Study

Education policies can play a critical role in transforming the education landscape and outcomes of learning. A prominent feature of the successful educational transformation in many countries is that policy reform efforts and programs are guided by a clear goal or vision, and implemented through a coherent planning, management, and monitoring process. Policies and programs need to address all the components of the system in a coordinated and coherent way so that changes, in turn, become mutually reinforcing and promote continuous improvement.

In this research, selected aspects of education policy and management frameworks are compared across the education systems between Japan and Singapore, and some identified emerging trends. These aspects include the school's best practices, curriculum, research program, and extension activities [1-3].

The educational systems of Japan and Singapore stand as exemplars of academic excellence and innovation, each shaped by unique cultural, historical, and socio-economic contexts. In Japan, the educational framework reflects a harmonious blend of traditional values and modern practices. The nation's emphasis on collective responsibility and a strong work ethic is deeply embedded in its education system. Scholars like Merry White (1993) have explored the cultural underpinnings of Japan's education, highlighting the role of Confucian values and the societal expectation for individuals to contribute to the greater good.

On the other hand, Singapore's educational landscape is characterized by its strategic efforts to transform the nation into a global hub for knowledge and innovation. Drawing from the works of Jason Tan (2008), we examine Singapore's educational policies, including the pivotal role of the Ministry of Education in orchestrating systemic changes. The emphasis on science, technology, engineering, and mathematics (STEM) education, as well as a multicultural approach to learning, has garnered attention as Singapore strives to prepare its citizens for a rapidly evolving global landscape. Despite the rigorous academic environments in both countries, there is a scarcity of in-depth studies exploring the psychological impact of educational practices on students. The emotional and psychological dimensions of the student experience, including stress levels, coping mechanisms, and the overall mental health impact, remain understudied. Recent global trends, including the rise in academic pressure and mental health concerns among students, necessitate a deeper investigation into the cultural and systemic factors shaping the well-being of students in Japanese and Singaporean educational contexts. Authors like Sakamoto and Kitamura (2007) have touched upon stress factors in Japanese schools, but a comprehensive analysis is lacking, especially in the comparative context with Singapore. This research endeavor aligns with the evolving discourse on holistic education and underscores the need for a balanced approach to educational

policies not only for the two countries but for all countries in the world.

Moreover, while both Japan and Singapore have high-performing education systems, they are influenced by different cultural and socio-economic factors. Understanding these influences can provide valuable insights for other countries seeking to improve their own education systems. Furthermore, the emotional and psychological dimensions of the student experience should not be overlooked, as they play a crucial role in the overall effectiveness of an education system. This calls for more research in this area, particularly comparative studies that can shed light on best practices across different educational contexts.

Despite the high PISA scores and international recognition of the educational systems in Japan and Singapore, there exist significant differences in their approaches to curriculum, instructional methods, assessment practices, teacher training, funding mechanisms, and equity considerations. These differences may lead to varied educational outcomes and experiences for students. This study aims to investigate the impact of these diverse approaches on student learning outcomes and experiences, and how best practices from each system can be integrated to enhance the overall quality of education.

1.2 Research Question

1. How do the differences in curriculum, instructional methods, assessment practices, teacher training, funding mechanisms, and equity considerations between the educational systems of Japan and Singapore impact student learning outcomes and experiences, and how can best practices from each system be integrated to enhance the overall quality of education?

1.3 Significance of the Study

The significance of this study lies in its potential to provide a comprehensive understanding of the educational systems in Japan and Singapore, two countries renowned for their high educational standards and outcomes. Here are some key points of significance:

1. Comparative Analysis: The study offers a comparative analysis of the educational systems in Japan and Singapore, highlighting the differences in their structures, curriculum, instructional methods, assessment practices, teacher training, funding mechanisms, and equity considerations. This comparison can provide valuable insights into the strengths and weaknesses of each system.
2. Pedagogical Insights: By examining the pedagogical philosophies and instructional methods employed in these countries, the study can shed light on effective teaching strategies and practices that can be adopted by other countries to improve their own educational systems.
3. Policy Implications: The study's findings can have significant policy implications, providing guidance for policymakers in other countries looking to reform their educational systems. The insights gained from this study could inform policy decisions related to curriculum development, teacher training, assessment practices, and funding mechanisms.
4. Equity Considerations: The study also addresses important equity considerations, such as rural-urban disparities in Japan and equal access for all students in Singapore. These findings can contribute to discussions on educational equity and inclusivity.
5. Impact on Student Outcomes: Finally, by examining the impact of these diverse approaches on student learning outcomes and experiences, the study can contribute to our understanding of how different educational practices affect student success.

2. METHODOLOGY

The study utilized Qualitative Comparative Analysis in comparing the educational systems of Singapore and Japan. Introduced by Charles Ragin in the 1970s, Qualitative Comparative Analysis (QCA) originally served as a research methodology and had gained prominence in monitoring and evaluation (M&E). QCA enabled the analysis of multiple cases in complex situations, shedding light on the reasons for change in specific instances. Its versatility accommodated both newly collected and existing data, and its key features included the ability to navigate complexity and clarify factors influencing change in specific cases (Ragin, 1970).

Qualitative Comparative Analysis employed set-theoretical reasoning and was particularly useful when dealing with small N (a small number of cases) studies. It sought to identify necessary and sufficient conditions for the occurrence of an outcome by systematically comparing cases with different combinations of conditions. QCA involved the use of truth tables to assess the relationships between conditions and outcomes. The method had found applications in various disciplines, including sociology, political science, and management studies, among others. Researchers appreciated QCA for its ability to capture complexity and provide nuanced insights into the configurational nature of causality.

Researchers employing QCA in this context might have been interested in identifying configurations of perceived opportunities, perceived capabilities, high job creation expectations, and motivation that were specific outcomes, such as successful job creation or entrepreneurial ventures. QCA allowed for the exploration of complex relationships and the identification of patterns that contributed to the desired outcomes. These configurations formed the basis for the two countries, Japan and Singapore, to align their education systems and economies, crucial for sustainable development and economic growth. When the education system was well-aligned with the needs of the economy, it could produce a skilled and adaptable workforce, foster innovation, and contribute to overall economic prosperity [4].

The first configuration was the perceived opportunities, likely referring to individuals' perceptions of available chances or possibilities for success, growth, or advancement in the context of employment or entrepreneurship. Next was the perceived capabilities, referring to individuals' assessments of their own abilities, skills, and resources to take advantage of the perceived opportunities, involving self-confidence and self-efficacy. Then, high job creation expectation suggested that individuals were anticipating a significant number of job opportunities to be created, based on economic conditions, industry trends, or personal assessments of the job market. Lastly, motivation in this context likely referred to the internal or external factors that drove individuals to pursue employment or entrepreneurial activities, including factors such as personal ambition, financial incentives, or a desire to make a positive impact.

This model had been used by researchers to highlight different approaches to aligning education with the economy, including vocational training, a focus on STEM disciplines, and adaptability to the changing needs of industries. Successful alignment often involved close collaboration between educational institutions, businesses, and policymakers to ensure that the skills developed in the education system matched the requirements of a dynamic and evolving economy.
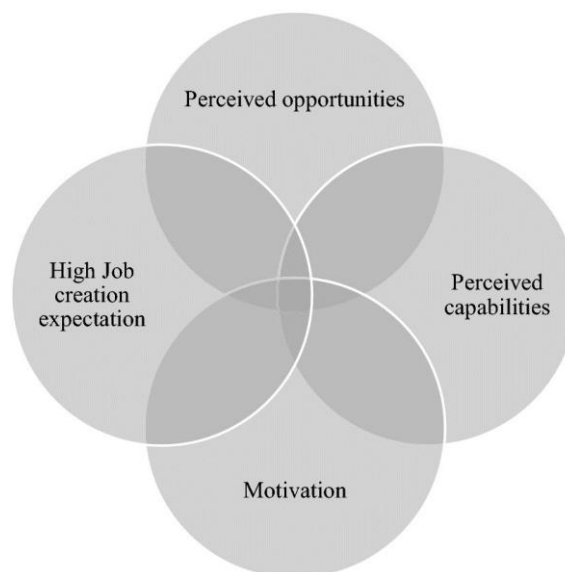

Fig. 1. Model tested using qualitative comparative analysis
Source: Thomas, J., O'Mara-Eves, A., & Brunton, G. (2014). Using Qualitative Comparative Analysis (QCA) in systematic reviews of complex interventions: a worked example. Systematic reviews, 3(1), 1-14.

Both Japan and Singapore had education systems designed to equip students with the skills needed for success in a highly competitive global landscape. The differences lay in their approaches to examinations, vocational education, and the balance between academic excellence and holistic development.

2.1 Singapore Educational System Structure

Singapore's Ministry of Education intends to "assist students in discovering and developing their own talents, realizing their full potential, and developing a passion for lifelong learning." The country has chosen a one-of-a-kind approach to education, with the primary goal of assuring each individual's overall personal and professional growth. Singapore's education system is separated into four levels: pre-school, primary, secondary, and post-secondary.

2.2 Preschool Level

As the initial level of the Singapore education system, the Preschool stage must be completed before the age of 7. Children admitted to this level of study are in either Play School or Kindergarten. They are familiarized with basic knowledge of colors, animals, and fruits as well as basic manners. The preschool level is often considered optional in Singapore. Parent generally send their kids to preschools operate by private organizations, community groups and charities.

2.3 Primary Level

Covering the beginning of formal schooling years, the primary education stage generally begins at the age of 6 and requires students to qualify for certain exams at the completion of this level of study. The major emphasis is put on imparting basic proficiency in languages (English and Native) along with mathematics. The primary education level is divided into two sub-levels which are explained in the following sections. The first 4 years are clubbed under the foundation stage of the Singapore Education System. During this phase, the students are familiarized with basic language skills as well as arithmetic. The curriculum at this level also includes general science as well as moral education. Along with this, additional time is devoted to extracurricular activities, physical education, arts, music etc. The Orientation stage corresponds to the concluding two years of the primary level in the Singapore education system. The students are taught foundational subjects and at the end of this level, students will have to qualify for Primary School Leaving Examination (PSLE) after which they have to select a stream of study to continue towards the secondary level. The education at the primary level is free and compulsory in Singapore.

2.4 Secondary Level

Usually, the secondary level in Singapore Education System lasts for 6 years but the duration can vary as per the capabilities of the students. Completing the primary level, students pick the stream they are most interested in and receive official certification for qualifying for the PSLE exam. For students who have opted for Special and Express courses will be receiving the General Certificate of Education 'Ordinary' Level (GCE 'O' Level) whereas Normal course students can choose between Normal Academic and Normal Technical and will receive the GCE 'N' Level certificate. Both certificates will be given at the end of the 4th year of secondary school. There are four tracks or streams offered at the secondary level in Singapore Schools and these streams are Normal (Academic), Normal (Technical), Integrated Programme and Express.

2.5 Post Secondary Level

In the Singapore Education system, formal education actually concludes at the secondary level typically at the age of 17. The next stage is the Post- Secondary level of study in which students can opt to study the course of their choice at any university. They can earn varying levels of study such as diplomaS, bachelor's degrees, master's degrees, etc. in the field of their choice and then begin their professional journey accordingly.

2.6 Singapore Educational System

Singapore's educational achievements have regularly drawn international attention. According to the Trends in International Mathematics and Science Study (TIMSS), Singaporean students from elementary and secondary schools consistently rank first in mathematics and science [5]. Additionally, Singapore routinely ranks in the top three in categories such as reading, maths, and science in the Programme for International Student Assessment (PISA), which is administered every three years. The

List 1. Educational system of Singapore

Education Level	Age	Class	Duration
Pre-school	4 to 6	Kindergarten	2 years
Primary	6 to 12	Primary 1 to 6	6 years
Secondary	12 to 18	Secondary 1 to 6	6 years
Post-secondary	18 onwards	Junior College/University Education	Depends on the chosen program

Singapore Math approach is frequently considered as a global success and is largely regarded as one of the reasons for students' extraordinary performance [6].

The success of the Singapore educational system can be attributed to several key strategies that have been implemented over the years. These strategies, aimed at ensuring a high-quality and globally competitive education, include: *Meritocratic System,* it is a Singapore's education system is highly meritocratic, placing a strong emphasis on academic achievement and performance. Students are assessed through a rigorous examination system, and the results play a crucial role in determining educational pathways and future opportunities. This meritocratic approach helps to identify and nurture talent from an early stage.

Focus on STEM education: Recognizing the importance of science, technology, engineering, and mathematics (STEM) in the modern economy, Singapore places a significant emphasis on these subjects in its curriculum. The country has implemented various initiatives and programs to promote STEM education, fostering a workforce with strong analytical and problem-solving skills.

Bilingual Education: Singapore adopts a bilingual education policy, with English as the medium of instruction and students required to learn a second language (their mother tongue). This policy not only promotes linguistic proficiency but also reflects the multicultural nature of Singaporean society, fostering a sense of national identity and cultural inclusivity

Holistic development: The Singaporean education system emphasizes the holistic development of students, focusing not only on academic excellence but also on character building and values education. The Character and Citizenship Education (CCE) curriculum is designed to instill values such as responsibility, resilience, and respect for others.

Innovative teaching methods: *The Singaporean education system encourages innovative teaching* methods, including inquiry-based learning and the use of technology in the classroom. Teachers are encouraged to adopt creative approaches to engage students and foster critical thinking skills, moving away from traditional rote memorization.

Education for the future: Singapore places a keen focus on preparing students for the future economy by equipping them with skills relevant to the 21st century. This includes an emphasis on information and communication technology (ICT) skills, creativity, and adaptability, ensuring that students are well-prepared for the challenges of a rapidly evolving global landscape.

Parental involvement: The involvement of parents in their children's education is actively encouraged in Singapore. Schools and educators maintain open communication with parents, keeping them informed about their child's progress and involving them in the learning process. This collaboration between schools and parents is seen as crucial for the overall development of students.

In conclusion, Singapore's education system serves as a blueprint for global excellence, demonstrating how a combination of strategic initiatives can create a learning environment that produces students with exceptional academic abilities, critical thinking skills, and a readiness to contribute meaningfully to a knowledge-based economy. The success of Singapore's approach lies not only in its commitment to academic rigor but also in its holistic vision for education, encompassing character development, cultural inclusivity, and a forward-looking perspective on the skills needed for success in the 21st century. As nations around the world seek to enhance their education systems, Singapore stands as an inspiring example of what can be achieved through thoughtful planning and a dedication to educational excellence.

2.7 QCA Model: Singapore Educational System

In summary, the perceived opportunities within the Singapore educational system, as analyzed through the QCA Model, underscore a commitment to academic excellence, holistic development, innovative teaching practices, and a forward-looking approach that aligns with the needs of the 21st century. These opportunities collectively contribute to the system's success in producing well-rounded and globally competitive individuals.

These perceived capabilities collectively reflect the strengths of students within the Singaporean educational system. The system's holistic approach not only focuses on academic excellence but also emphasizes the development of skills and qualities essential for success in a rapidly changing and interconnected world.

Table 1. QCA Model: Singapore educational system

Perceived Opportunities	Opportunity	Benefit
Academic Rigor and Meritocracy	The emphasis on academic excellence and a meritocratic system provides opportunities for students to strive for high standards.	This approach motivates students to achieve their best, fostering a competitive environment that pushes individuals to excel academically.
STEM Education Focus	Singapore's strategic focus on STEM subjects in the curriculum	This opportunity ensures that students are well-prepared for careers in science, technology, engineering, and mathematics, aligning education with the demands of a technology-driven global economy.
Bilingual Education Policy	The bilingual education policy, with English as the medium of instruction and a requirement for students to learn a second language.	This opportunity promotes linguistic proficiency and cultural inclusivity, preparing students to engage with a globalized world while maintaining a connection to their cultural heritage.
Holistic Development and Values Education	The commitment to holistic development through the Character and Citizenship Education (CCE) curriculum.	This opportunity promotes linguistic proficiency and cultural inclusivity, preparing students to engage with a globalized world while maintaining a connection to their cultural heritage.
Continuous Professional Development for Teachers	Investment in the continuous professional development of teachers.	This opportunity ensures that educators stay updated on the latest pedagogical approaches, fostering an environment where innovative teaching methods can thrive, contributing to a dynamic and effective learning experience.
Innovative Teaching Methods	The encouragement of innovative teaching methods, including inquiry-based learning and the integration of technology.	This opportunity facilitates a dynamic and engaging learning environment, fostering critical thinking and problem-solving skills among

Perceived Opportunities	Opportunity	Benefit
		students.
Emphasis on 21st Century Skills	The emphasis on 21st-century skills, including information and communication technology (ICT) skills, creativity, and adaptability.	This opportunity ensures that students are equipped with skills that are relevant to the evolving demands of the modern workforce, preparing them for success in a rapidly changing global landscape.
Parental Involvement	The active involvement of parents in their children's education.	This opportunity fosters a collaborative partnership between schools and parents, creating a supportive environment for student learning and development.

Table 2. Perceived capabilities

Perceived Capabilities	Capability
Strong Academic Foundation	Students in the Singaporean educational system typically possesses a strong academic foundation in core subjects such as mathematics, science, and language arts
Critical Thinking and Problem-Solving Skills	The system emphasizes the development of critical thinking and problem-solving skills, enabling students to analyze complex situations and come up with innovative solutions
Technological Competence	Students demonstrate technological competence, having been exposed to information and communication technology (ICT) throughout their education.
Bilingual Proficiency	Graduates are proficient in both English and a second language, contributing to effective communication and cultural competence in diverse settings.
Adaptability and Resilience	The Singaporean educational system instills adaptability and resilience in students, preparing them to navigate challenges and changes in various aspects of life.
Global Perspective	Students develop a global perspective through exposure to diverse cultures and global issues, making them well-prepared for international collaboration.
Collaboration and Communication Skills	Emphasis on collaborative learning and effective communication skills equips students with the ability to work well in teams and articulate their ideas clearly.
Values and Ethics	Character and Citizenship Education (CCE) fosters strong values and ethics, contributing to students' sense of social responsibility and ethical decision-making.
Time Management and Discipline	The rigorous nature of the educational system cultivates strong time management skills and discipline among students, contributing to their ability to handle academic and professional

Perceived Capabilities	Capability
	responsibilities.
Entrepreneurial Spirit	Students are encouraged to explore an entrepreneurial mindset, fostering creativity, risk-taking, and a proactive approach to problem-solving.
Cultural Awareness	Bilingual education and exposure to diverse cultural experiences contribute to students' cultural awareness and inclusivity, preparing them for a globalized world.
Leadership Quality	The system encourages the development of leadership qualities through extracurricular activities, projects, and collaborative initiatives.

Table 3. High job creation

High Job Creation		Benefit
Close Industry Collaboration	The encouragement of innovative teaching methods, including interactive and inquiry-based learning, fosters creativity and critical thinking among students.	Graduates exposed to such methods are better prepared to solve complex problems and adapt to dynamic work environments, thereby contributing to increased job creation in industries that value innovation.
Global Outlook and Cultural Competence	Singapore encourages collaboration between educational institutions and industries, ensuring that academic programs align with industry needs.	Graduates are equipped with practical skills and experiences that directly meet the demands of the job market, leading to higher employability and job creation.
Government Initiatives and Economic Planning	The educational system instills a global outlook and cultural competence in students.	Government-led strategies ensure that the education system aligns with economic goals, creating a workforce with the skills required for emerging industries, thereby contributing to job creation.

Table 4. Motivation

Motivation	Component	Explanation
Recognition and Reward System	Recognition and Reward	The Singaporean educational system places a strong emphasis on recognizing and rewarding academic achievement. High-performing students are often acknowledged through various means, such as awards, certificates, and public recognition. This recognition serves as a powerful motivator for students to excel academically.
Competitive Environment	Competition and Comparison	The system's meritocratic

Motivation	Component	Explanation
		nature fosters healthy competition among students. The emphasis on academic excellence and standardized testing creates an environment where students are motivated to outperform their peers. The competitive spirit contributes to a drive for continuous improvement.
Clear Pathways and Goal Setting	Goal Setting and Planning	The Singaporean educational system provides clear pathways for students, outlining the steps needed to progress from primary to tertiary education. The structured nature of the system, coupled with goal-oriented milestones, motivates students to work towards achieving specific academic targets and career aspirations.
Parental Expectations and Involvement	Social Support and Influence	The active involvement of parents in their children's education, coupled with high parental expectations, contributes significantly to student motivation. Family support and expectations create a positive social environment that encourages students to take their education seriously.
Teacher Guidance and Support	Leadership and Guidance	Teachers play a crucial role in providing leadership and guidance to students. Their influence extends beyond the classroom, with educators often serving as mentors. The support and guidance offered by teachers contribute to students' motivation by fostering a sense of belonging and encouragement.
Extrinsic Motivator	Rewards and Punishment	The educational system incorporates a mix of intrinsic and extrinsic motivators. While intrinsic motivation is cultivated through a passion for learning, extrinsic motivators, such as grades, rankings, and recognition, provide tangible rewards that drive students to perform well.
Emphasis on Excellence	Quality Emphasis	The system places a strong emphasis on quality and

Motivation	Component	Explanation
		excellence. Whether in academic achievements or non-academic pursuits, students are motivated to pursue excellence in their endeavors. The culture of excellence becomes a driving force for continuous improvement.
Holistic Development Goals	Holistic Development	Beyond academic achievements, the Singaporean educational system emphasizes holistic development, including character education and values. This holistic approach motivates students to develop not only academically but also as well-rounded individuals with strong values and ethics.
Cultural Influences	Cultural and Social Context	Cultural factors, including the value placed on education in Singaporean society, contribute to the motivation of students. The cultural context reinforces the importance of education as a means of personal and societal advancement.
Alignment with Career Aspirations	Alignment with Aspirations	The educational system aligns with career aspirations through specialized tracks and educational pathways. This alignment ensures that students see a clear connection between their academic pursuits and future career goals, motivating them to excel in their chosen fields.

In conclusion, the success of the Singaporean educational system in generating high job creation is rooted in a holistic approach that combines academic excellence, skills development, values education, and strong partnerships with industries. This multifaceted strategy ensures that graduates are not only well-prepared for existing job markets but are also adaptable to the evolving needs of a dynamic global economy. The integration of these factors positions Singapore as a global leader in education and economic success.

In summary, the QCA Model offers a lens through which we can understand the motivational factors within the Singaporean educational system. The combination of recognition, competition, clear pathways, parental involvement, teacher guidance, a mix of intrinsic and extrinsic motivators, emphasis on excellence, holistic development, cultural influences, and alignment with career aspirations collectively contributes to the high levels of motivation observed among students in Singapore.

2.8 Japan Educational System

The education system in Japan stands as a testament to the nation's commitment to academic excellence, cultural values, and socio-economic development. Rooted in a rich historical context, the Japanese educational

system has evolved over the years to become a globally recognized model.

The compulsory education system in Japan comprises a 9-year period, including 6 years of primary education and 3 years of lower secondary education. While instruction is primarily in Japanese, there is a growing availability of higher education programs in English. Higher education institutions typically follow an academic year from April to March, with a majority adopting a 2-semester system (Zergani, 2015).

Japan's educational system is well-regarded for its emphasis on academic achievement, discipline, and a strong work ethic. The system is characterized by its rigorous curriculum, standardized testing, and a structured progression from primary to tertiary education. Some of the key components of its educational system are the compulsory education for children from age of 6 to 15, covering elementary and lower secondary education. Elementary education is years long, and lower secondary education is three years long.

In addition to the key components of their educational system, Japan also are very particular in entrance exams which are crucial for advancing to the level of education, especially for upper secondary schools and universities. Students often prepare intensively for these exams, and success in exams is a significant factor in determining future educational and career opportunities.

In higher education, university education is highly valued, and admission to prestigious universities is competitive. Universities often specialize in specific fields of study, and students choose their institutions based on career aspirations. Aside from universities, Japan also offered vocational education that focus to prepare students for specific careers. Technical colleges and vocational schools provide alternative paths for those who choose not to pursue a university education. And lastly, the post-graduate education, including master's and doctoral programs, is common for those pursuing academic and research careers.

Japan's educational system reflects a balance between traditional values and the need to adapt to the demands of a modern, globalized society. The commitment to academic excellence, discipline, and hard work remains central, while efforts to promote a more diverse and innovative educational environment continue to evolve.

Perceived opportunities in the Japanese educational system can be analyzed through various aspects, emphasizing the potential benefits and areas for improvement. Here's a breakdown based on different dimensions:

In summary, the perceived opportunities in the Japanese educational system lie in the potential for growth and improvement across various dimensions, ranging from academic innovation and inclusivity to the integration of technology and global perspectives. The ongoing efforts to adapt and evolve the system indicate a commitment to preparing students for a dynamic and interconnected world.

Perceived capabilities of students in Japan's education system reflect a combination of academic prowess, cultural values, and a diverse skill set. While strengths exist in various areas, ongoing efforts to foster creativity, critical thinking, and a more global perspective indicate a commitment to preparing students for the challenges and opportunities of the future.

Table 5. Japan educational system perceived opportunities

Dimensions	Strengths	Opportunities
Academic Excellence	Strong emphasis on core subjects, contributing to high academic achievement.	Encouraging critical thinking and creativity alongside academic rigor.
	Well-established reputation for quality education, with globally recognized universities.	Promoting interdisciplinary approaches to prepare students for diverse career paths.
Discipline and Work Ethics	Emphasis on discipline and a strong work ethic contributes to	Balancing discipline with fostering individuality and

Dimensions	Strengths	Opportunities
	a focused learning environment.	creativity.
	Cultivation of responsibility and respect for authority.	Incorporating soft skills development, such as teamwork and communication, into the curriculum.
Global Perspective	Increasing efforts toward internationalization, including English language education. Opportunities for students to engage with global issues	Enhancing cross-cultural understanding through more diverse perspectives in the curriculum. Encouraging study abroad programs and cultural exchanges to broaden students' horizons.
Technological Integration	Recognition of the importance of technology, with efforts to integrate it into education. Availability of resources and infrastructure for technology-enabled learning.	Continuously updating technology education to keep pace with rapid advancements. Promoting digital literacy and critical thinking in the use of technology.
Vocational Education	Acknowledgment of the significance of vocational education. Opportunities for students to pursue technical and practical skills.	Reducing the stigma associated with vocational paths and promoting them as valuable alternatives. Strengthening partnerships with industries to align vocational education with workforce needs.
Extracurricular Activities	Availability of diverse extracurricular activities and clubs. Opportunities for students to develop leadership and teamwork skills.	Ensuring equal access to extracurricular opportunities for all students. Recognizing and valuing non-traditional skills developed through activities.
Inclusivity	Efforts to provide equal educational opportunities. Support systems for students with diverse learning needs.	Continuously improving support for students with disabilities or special educational needs. Fostering a more inclusive and diverse learning environment.
Entrepreneurship and Innovation	Increasing recognition of the importance of fostering innovation. Entrepreneurship programs and initiatives in some educational institutions.	Expanding entrepreneurship education to a broader range of students. Encouraging a culture of innovation and risk-taking in education.

Table 6. Perceived capabilities

Key Components	Strengths	Key Capabilities
Global Competence	Efforts to internationalize education are exposing students to global perspectives. English language education is gaining importance.	Developing cross-cultural understanding. Acquiring proficiency in English and global communication skills.
Technology Literacy	Recognition of the importance of technology in education. Students have access to technology and are familiar with digital tools.	Basic and advanced technology literacy. Adaptability to technological advancements.
Problem-solving skills	The education system encourages critical thinking and problem-solving. Students often excel in tasks that require logical reasoning.	Analytical thinking and problem-solving skills. Ability to approach challenges systematically.
Teamwork and Collaboration	Participation in extracurricular activities and group projects fosters teamwork. Students often develop strong collaborative skills.	Effective communication within a team. Collaboration and cooperation in group settings.
Cultural and Ethical Values	Education includes the transmission of cultural and ethical values. Students are often instilled with a sense of responsibility and duty.	Understanding and practicing ethical behavior. Valuing cultural heritage and traditions.

Table 7. Perceived capabilities

Key Components	Strengths	Key Capabilities
Curriculum	A strong emphasis on academic excellence and a well-defined curriculum. Integration of practical and vocational education, ensuring relevance to job market needs.	Continual adaptation of the curriculum to meet evolving industry demands. Promotion of interdisciplinary studies to develop versatile skills.
Pedagogy	A disciplined and structured approach to teaching and learning. Integration of hands-on learning experiences and practical applications.	Emphasizing critical thinking and problem-solving in pedagogical approaches. Encouraging innovative teaching methods to foster creativity and adaptability.
Assessment	A robust assessment system that includes standardized testing.	Exploring alternative assessment methods to measure a broader range of skills.

Key Components	Strengths	Key Capabilities
	Clear pathways from education to employment based on assessment results.	Ensuring that assessments align with the evolving needs of the job market.
Opportunities to students	Clear pathways for students from school to university and then to employment.	Enhancing career guidance and counseling services for students.
	Vocational education opportunities for practical skill development.	Facilitating internships and work-study programs to provide real-world experience.
Innovation and Technology Integration	Recognition of the importance of technology in education. Strong focus on science, technology, engineering, and mathematics (STEM) fields.	Encouraging innovation in teaching methods and curriculum design. Aligning technology education with emerging industry trends.
Industry-Academia Collaboration	A tradition of close collaboration between educational institutions and industries.	Strengthening partnerships with industries to ensure curriculum relevance.
	Joint research projects and internships that bridge the gap between academia and the job market.	Facilitating industry feedback to adapt educational programs.

Table 8. Motivation

Key Components		
Extrinsic vs. Intrinsic Motivation	A balance between intrinsic motivation (personal interest in learning) and extrinsic motivation (external rewards) can drive students to excel. Recognizing and rewarding achievements can enhance motivation.	
Feedback and Recognition	Timely and constructive feedback, coupled with recognition for achievements, positively influences student motivation. Opportunities for students to showcase their talents contribute to motivation.	

In applying the QCA Model to Japan's educational system, the strengths and opportunities identified reflect the system's overall effectiveness in preparing students for the job market. However, the continuous improvement aspect underscores the need for ongoing adjustments to ensure alignment with evolving employment trends and the demands of a rapidly changing global economy.

In summary, the motivation in Japan's educational system is influenced by a complex interplay of factors. While certain aspects contribute to high motivation, others may moderate or influence motivation differently for individual students. The QCA approach allows for a nuanced understanding of the multifaceted nature of motivation within the specific context of Japan's education system.

3. HIGHER EDUCATION IN JAPAN AND SINGAPORE

3.1 Higher Education In Singapore

The Higher Education in Singapore is managed and administered by the Ministry of Education (MoE). After completion of 12 years of school education or equivalent students proceed to pursue college programme. Junior colleges and centralized institutes act as a preparatory school for higher education and offer two-year or three-year programs, resulting in the GCE "A" Level examination. Polytechnics, on the other hand, have the intention of educating middle-level professionals in technical and economic fields with the program ending with an advanced diploma.

Singapore's higher education institutions equip students with the knowledge and skills imperative to work in the industry. Singapore has always been an ideal study destination for those planning to pursue higher education in culturally vibrant Asia. Multiple factors like high standards of teaching, top institutions and affordable costs have made the country rank higher when it comes to attaining overseas education and thus, more and more students are now opting to study in Singapore.

In the Singapore Education system, formal education actually concludes at the secondary level typically at the age of 17. The next stage is the Post- Secondary level of study in which students can opt to study the course of their choice at any university. They can earn varying levels of study such as diplomas, bachelor's degrees, master's degrees, etc. in the field of their choice and then begin their professional journey accordingly. The syllabus and curriculum for the PSLE, GCE O, N, and A-Levels are curated by the Ministry of Education Singapore, and it differs from the Cambridge IGCSE curriculum. The curriculum is curated by the Ministry of Education in Singapore to emphasise student participation and innovation. The curriculum is updated on a regular basis to provide instructors and students with fresh options.

Universities prepare students for the knowledge economy, equip them with skills to thrive professionally, and contribute to the research and innovation ecosystem. There are six publicly-funded Autonomous Universities (AUs) in Singapore that provide a wide range of academic, research, work-learn and student life options to cater to students' diverse interests and learning styles.

Since 2004, the government developed the "Teach Less, Learn More" initiative, which moved instruction further away from its early focus on rote memorization and repetitive tasks and toward deeper conceptual understanding and problem-based learning. Educators abandoned the practice of funneling students into ability-based tracks and began sorting them into three different "bands" in secondary school based on their ultimate educational goal. Although students take most of their classes within their bands, they can take classes in other bands depending on their aptitude and interest in a given subject. The goal is to achieve full subject-based banding, with students freely mixing and matching classes from different bands in 2024.

Singapore's current priorities for its education system are reflected in the title of its initiative "Every School a Good School." This set of reforms aims to ensure that all schools have adequate resources to develop customized programs for their students; raise professional standards for teachers; encourage innovation; and foster partnerships between schools and communities. In addition, Singapore launched the "Learn for Life" initiative in 2018 to promote greater flexibility in teaching, learning, and assessment. With more opportunities for self-directed learning in and out of school, Singapore hopes to encourage lifelong learning for all Singaporeans, in ways that bring them satisfaction and meaning.

3.2 Higher Education in Japan

The Japanese higher education system is a very powerful tool for their national politics and culture. The Academic accomplishments of the students studying in Japan are higher and befitted the international criteria and standards. The general policy, management and administration are under the authority of the Ministry of Education.

The Japanese Government has the authority to sanction the formation of all new higher education institutions, both private and public. The finances of Universities, Junior Colleges, Specialised Colleges, Graduate Schools and College of Technology come under the jurisdiction of the Ministry of Education or Monbusho. It also lays down the minimum standards for universities with regard to

curriculum, facilities, qualification and number of teachers. Many institutions can exercise autonomy in many issues, but the Ministry of Education (Monbusho) keeps hold of the main influence over the growth and development of higher education in Japan.

The higher education in Japan begins after the completion of 12 years of education comprising, 6 years of elementary education and 6 years of secondary education (lower and upper secondary schooling). The students graduating from High school are eligible to go for higher education in Japan. Around 45% students from high school opt for higher education. The Japanese transformed their higher education system by adapting and acquiring useful and valuable information and technology from different education systems. The educational culture of Japan is established on the Shinto, Buddhism and Confucianism philosophy. During the 19th-20th century, three major reforms were introduced in the field of education in Japan, which contributed to individual work of students, as well as originality, individuality and internationalization of education. Equality in education is one of the modern educational norms of Japan.

Table 9. QS Ranking of Universities in 2023 for Asia

Universities	QS Ranking 2023 for Asia
National University of Singapore	2
Nanyang Technology University	3
Singapore Management University	117
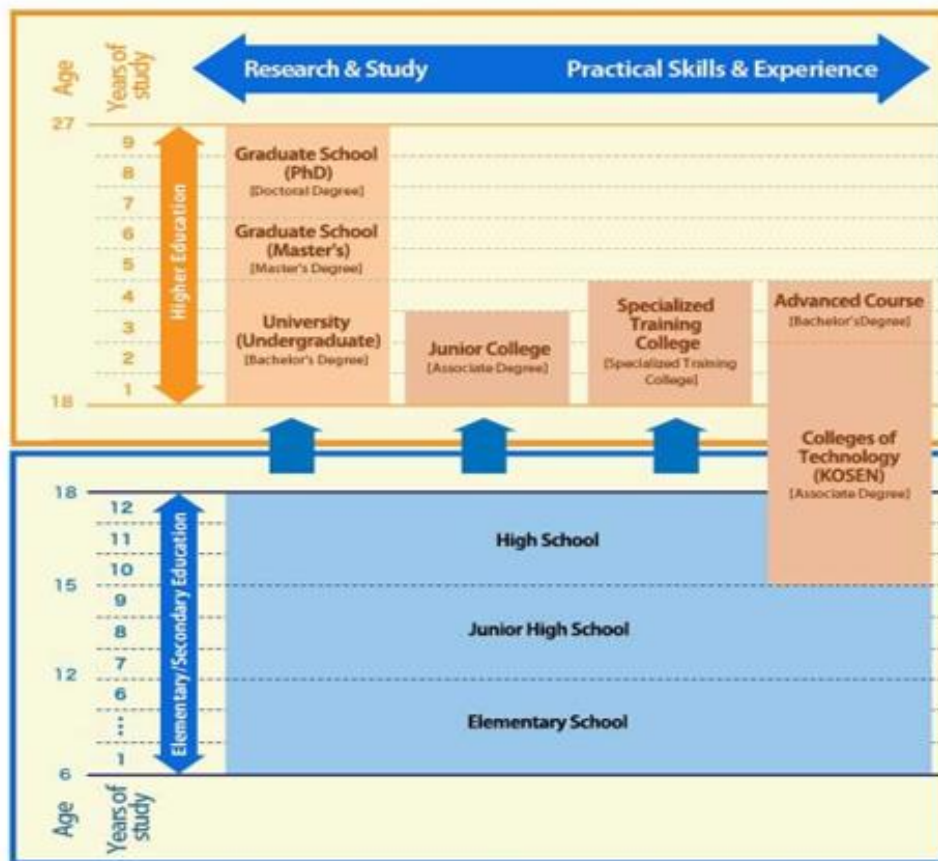
Note : Years of study for each educational institution vary by department and course.
: Degree or title is displayed in brackets [ ].

Fig. 2. Categorization of higher education in Japan

Japan's educational system is in a top position in terms of quality and performance. The average student scored 540 in reading literacy, maths and science in the OECD's Programme for International Student Assessment (PISA), which is higher than the OECD average of 497, making Japan one of the top OECD countries in students' ability and skills.

Approximately 70% of students who graduate from high school go for higher education studies, thereby making Japan one of the most educated nations in the globe.

Japan aims of further improving the standard and international competitiveness of Japanese higher education institutions' education and research, efforts to ensure and improve the quality of higher education have been promoted. In specific terms, the establishment approval system and the quality assurance and accreditation system have been combined to build a system whereby any higher education institution can be encouraged to actively improve its quality while respecting its own initiative. To assure the quality that can meet global demands and protect students' benefit, the approval by the Minister of Education, Culture, Sports, Science and Technology is required in order to establish universities. Upon approval, the Council for University Establishment and School Corporation comprising experts shall conduct an inspection under the minimal standards for university establishment of the University Establishment Standards. Since 2004, only prior notification to the Minister shall be required to change the organizational structure such as in the case where the types and areas of academic degrees awarded by the university are not changed upon the establishment of faculties.

In an effort to improve Japan's international competitiveness, graduate schools have been expected to raise not only researchers, etc. but also highly specialized human resources having wide viewpoints and capable of demonstrating their abilities in diverse areas, including businesses and administrative organization. Aiming to ensure systematic education activities in graduate schools, the Ministry of Education, Culture, Sports, Science and Technology has developed the infrastructures, including the development of teaching staff and equipment for graduate schools (in 1974), the establishment of independent academic units of graduate schools (in 1974), the establishment of graduate universities (in 1976) and making the clarification

and disclosure of purposes for human resources development mandatory (in 2007). In promoting graduate education, it is important to clarify educational purposes, enrich coursework that can meet international standards, conduct strict performance evaluation, and ensure appropriate research instructions [7].

In order to strengthen the international competitiveness of Japanese higher education and to offer attractive and high-quality education for international students, it is very vital to develop universities as centers for internationalization, in which many international students and professors are welcome and enjoy high-quality education and research. Japan, existing funding for universities is mainly divided into the following three types: funding for basic expenses, competitive funds for individual teachers' research activities and financial assistance to students. In addition, efforts to increase the funding based on competition among all universities including national, public and private are intensified. This kind of development of a systematic funding structure allowing universities to specialize their functions and promote their reform is the advantage of funding strategy in Japan [8,9].

4. HIGHER EDUCATION IN SINGAPORE VS. JAPAN

Admission Criteria: Singapore's higher education institutions emphasize competitive admission criteria, relying on academic performance, standardized test scores, and occasionally interviews. In contrast, Japan places a significant emphasis on entrance exams, requiring extensive preparation in specific fields of study.

University System: Singapore's compact higher education system hosts world-renowned institutions like the National University of Singapore (NUS) and Nanyang Technological University (NTU). Japan's diverse university landscape includes prestigious institutions like the University of Tokyo, emphasizing research and academic excellence.

Teaching and Learning Styles: Singaporean universities prioritize a diverse approach, incorporating lectures, tutorials, and practical applications with a growing emphasis on interactive and collaborative learning. In Japan, while traditional lecture-style teaching prevails, there's a trend towards integrating more

interactive and practical methods to enhance the overall learning experience.

Globalization and Internationalization: Singapore's highly internationalized higher education sector fosters a global learning environment, attracting a significant number of international students and faculty. Japan, while making efforts to internationalize, may not match Singapore's cosmopolitanism, with some universities actively promoting international collaboration and exchange programs.

Research and Innovation: Singapore places a strong focus on research and innovation, collaborating with industries to contribute to technological advancements. Japan boasts a rich history of research, particularly in technology and science, with many universities serving as hubs for cutting-edge research and producing Nobel laureates.

Language of Instruction: In Singapore, English serves as the primary language of instruction, promoting accessibility for international students and creating a global learning atmosphere. In Japan, although some courses are offered in English, the predominant language of instruction is Japanese, potentially posing challenges for non-proficient international students.

Employability and Industry Connections: Singapore's higher education system maintains strong ties with industry, ensuring graduates are well-prepared for the workforce through collaboration with businesses. Japanese universities also focus on employability, with networking and industry connections playing a crucial role in job placement.

Cultural Influence on Education: Singapore's education system reflects a blend of Western and Asian influences, striving for a well-rounded education that combines academic excellence with values and character development. In contrast, Japan's education system is deeply rooted in its culture and traditions, emphasizing discipline, respect, and a hierarchical structure within academic settings.

Table 10. Comparison of higher education in Japan and Singapore

Aspect	Japan	Singapore	Analysis and Explanation
Administration	Ministry of Education (Monbusho)	Ministry of Education (MoE)	Both countries have a centra liz ed administration, ensuring stan dards and overseeing the forma tion of new institutions.
Entrance Criteria	High school graduates (approx. 70% pursue)	Flexible pathways post 12 years of education	Japan emphasizes individuality, originality, and internationaliz at ion. Singapore offers diverse pa thways catering to varied interests.
Global Competitiveness	Strong global competitiveness in PISA	Globally recognized institutions (e.g., NUS)	Japan excels in global assessm ents, while Singapore boasts top - ranking universities contributing to its global appeal.
Quality Assurance	Approval and quality assurance systems	"Teach Less, Learn More" and "Every School a Good School" initiative	Both nations focus on quality assurance and continuous improvement, with Singapore emphasizing innovative teaching.
Graduate Education Focus	Specialized human resources, wide viewpoints	Lifelong learning initiatives	Japan aims for diverse capabili ties, while Singapore promotes flexibility and self-directed learn ing for lifelong education.
Internationalization	Centers for internationalization	Increasing international student intake	Both countries recognize the importance of internati onaliz ation, attracting students and fostering global perspectives.
Funding Strategy	Systematic funding structure	Competitive funding for universities	Japan's systematic funding allo ws specialization, while Singa po re encourages competitiveness among universities for funding.

Aspect	Japan	Singapore
Compulsory Education Duration	9 years (elementary to junior college)	9 years (elementary to secondary school)
Dominance of School Types	More private schools	More dominant public schools
University Education Duration	Usually 4 years, with some 5-year programs	Usually, 3 years
Prestigious Universities	National University of Tokyo, Kyoto University	Nanyang Technological University, National University of Singapore
Research Focus	Emphasis on traditional disciplines	Emphasis on emerging disciplines
Top Universities Ranking (Asia)	Top 10 (e.g., Tokyo, Kyoto)	Top 50 (e.g., Nanyang Technological University, National University of Singapore)
Disciplinary Emphasis	Engineering, science, medicine, humanities	Business, finance, management, social sciences
Internationalization Policy	Conservative and selective	Liberal and inclusive
Collaboration with Foreign Partners	Emphasis on maintaining academic excellence and autonomy	Collaboration with foreign partners across different regions

The analysis highlights the similarities and differences in higher education approaches in Japan and Singapore, considering factors such as administration, entrance criteria, global competitiveness, quality assurance, graduate education focus, internationalization, and funding strategies.

Table 11. Comparative Analysis of Basic Education in Japan and Singapore

Aspect	Japan	Singapore	Supporting Authors
Structure	6-3-3 system (6 years elementary, 3 years junior high, 3 years senior high)	4-4-4 system (4 years primary, 4 years secondary, 4 years pre-university/vocational)	OECD (2019), World Education News & Reviews (2023)
Curriculum	Emphasis on national standards, rote lear ning, and basic skills	Emphasis on critical thinking, problem-solving, and creativity	Knight (2020), Tan (2022)
Instructional Methods	Traditional teacher-cent ered approach with lim Ited student parti cipati on	Varied methods including project-based learning, collaborative lea rning, and technology int egration	Yamashita (2018), Goh (2021)
Assessment	Standardized national exams with high stakes	Diverse assessment methods including internal exams, projects, and portfolios	Mizuoka (2017), Teo (2020)
Teacher Training & Support	Strong focus on subject knowledge and standa rdized training	Emphasis on pedagogical skills, continuous professional development, and career progression	Nakata (2019), Ong (2022)
Funding	Primarily public funding with limited private invo lvement	Strong public-private partnership for funding and innovation	World Bank (2021), Leong (2023)
Equity & Access	Concern about increas ing disparities in rural and urban areas	Strong emphasis on equity and ac cess for all students, regardless of background	OECD (2023), Tan (2022)
Outcomes	High PISA scores but concerns about rote learning and student stress	High PISA scores and strong pe rformance in international benc h marks	OECD (2018), Yamashita (2018)

5. CONCLUSION

Moreover, delving into the nuanced landscapes of higher education in Japan and Singapore, our exploration has illuminated distinct characteristics and strategic imperatives that define the educational trajectories of these two nations. The administrative frameworks, while centralized in both countries, showcase variations in emphasis and approach. Japan, guided by the Ministry of Education (Monbusho), underscores individuality and internationalization, seeking to produce graduates with diverse capabilities on a global scale. Singapore, under the Ministry of Education (MoE), prioritizes flexibility, innovation, and competitiveness, epitomized by globally acclaimed institutions such as the National University of Singapore (NUS).

Entrance criteria unveil the divergent pathways post 12 years of education, with Japan embracing a holistic approach for high school graduates and Singapore offering multiple flexible routes. Global competitiveness emerges as a distinctive feature, with Japan excelling in global assessments and Singapore boasting top-ranking institutions contributing to its international allure. Quality assurance mechanisms underscore a shared commitment to continuous improvement, with Japan's meticulous approval and quality assurance systems and Singapore's initiatives like "Teach Less, Learn More" and "Every School a Good School."

Graduate education focus varies, as Japan aims to cultivate specialized human resources with broad viewpoints, and Singapore advocates for lifelong learning, flexibility, and self-directed education. Internationalization efforts in both nations align with the imperative of fostering global perspectives, attracting international students, and creating centers for internationalization.

Funding strategies reflect divergent philosophies, with Japan's systematic approach allowing for specialization and Singapore's competitive funding fostering a dynamic environment among universities. In conclusion, our comparative analysis provides a comprehensive understanding of the higher education ecosystems in Japan and Singapore, offering valuable insights for policymakers, educators, and researchers striving for continual enhancement in the ever-evolving landscape of global higher education.

6. RECOMMENDATIONS

1. Cross-Cultural Collaboration: Facilitate increased collaboration between Japanese and Singaporean higher education institutions to foster cross-cultural exchanges, joint research projects, and student mobility programs. This collaboration can enhance global perspectives for students and contribute to the internationalization goals of both nations.
2. Flexibility in Entrance Criteria: Consider adopting elements of each other's entrance criteria to promote a more holistic and flexible approach. Japan may benefit from incorporating Singapore's flexible pathways post-12 years of education, while Singapore could explore aspects of Japan's focus on individuality and diversity.
3. Quality Assurance Enhancement: Both nations should continue to invest in and refine their quality assurance mechanisms. Regular reviews and updates to ensure relevance and effectiveness will contribute to the sustained global competitiveness of their higher education systems.
4. Innovation in Teaching Methods: Encourage the exchange of best practices in teaching methods. Japan could explore Singapore's innovative initiatives like "Teach Less, Learn More" to foster deeper conceptual understanding, while Singapore might find inspiration in Japan's emphasis on individual work and originality.
5. Lifelong Learning Initiatives: Japan can draw inspiration from Singapore's emphasis on lifelong learning and self-directed education. Integrating elements of Singapore's "Learn for Life" initiative can further promote continuous learning and adaptability among Japanese students.
6. Strategic Funding Allocation: Both nations should continuously review and adapt their funding strategies. Japan's systematic funding structure can inspire Singapore to explore more systematic funding options, ensuring universities can specialize their functions while promoting reforms.
7. Further Research on Graduate Education: Conduct further research to explore the impact of graduate education on workforce readiness and international competitiveness. Both countries can benefit from shared insights on developing

highly specialized human resources and fostering innovation through graduate programs.

8. Promoting Multilingualism: Given the multicultural nature of Singapore and the linguistic diversity in Japan, both nations could explore language exchange programs to enhance linguistic proficiency and cultural inclusivity among their students.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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