

A red silhouette illustration of the Singapore skyline, featuring the Marina Bay Sands hotel, the Esplanade - Theatres on the Bay, and various skyscrapers. An airplane is shown flying above the skyline, leaving a long white contrail.

Reimagining the Study of Economics for Singapore's Next 60 Years

By **Mr Sylvester Swee, FRM**

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To achieve an education curriculum that is highly adaptable and responsive to change, technology and data literacy should first and foremost be embedded into economic learning.

Singapore has established itself as an economic marvel where nations far-and-wide seek to learn from how we have transformed ourselves over the past 60 years, from a post-colonial trading port to a global financial hub. Certainly, much can be attributed to the respectable foresight of our founding father, Mr Lee Kwan Yew, who understood that education—knowledge, skills and expertise—was a pivotal thrust towards achieving economic growth. As we look ahead to the next 60 years, the future of economics learning holds profound potential: not merely as an enabler that prepares individuals for their future careers, but more importantly that as we advance as “One Singapore”, to shape ourselves as a resilient and inclusive nation, with world class standards at the forefront of global excellence. If I could reimagine economics as a study, the following would be broad-based developmental transformations to maintain an edge.

Real-time and realistic. Historically, economics education has been overly-focused on attaining an optimal solution in a perfect world, where graphs simplistically point to a supposed one-state “maximum efficiency” outcome. Yet, today in an ever-changing VUCA environment, we know that this perfect “Goldilocks” solution could never be farther from the truth. New challenges increasingly and continually confront us: For example, we can clearly see that the world is increasingly more protectionist, with an ongoing shift in global orders as we speak, where trade-dependent tiny nations like ourselves are highly susceptible to rule changes and tariff fluctuations. How can we learn to find solutions in such a volatile environment?

Data-driven. To achieve an education curriculum that is highly adaptable and responsive to change, technology and data literacy should first-and-foremost be embedded into economic learning. For example, we can see that wars are now increasingly won by drones (which was by tanks not too long ago). As a concept, we know that there is a premium placed upon Singapore as a safe haven and investment target, but can this be quantified in terms of “economic capital” as a function of risk? Or can social mobility and economic resilience be quantified? Future economists must therefore be adept at using big data to diagnose systemic issues, measure changes and recommend solutions. Real-time data will allow for highly reactive intervention.

To take this thought further, in the classic GDP formula where investment contributes to growth, would we know which specific industry would be the best to invest in over the next five years, for optimal dollar-for-dollar yield? Or could we measure the resilience of interconnected supply chains which span hundreds of countries for a single product? Data granularity would serve as effective proof-of-concept. The banking concept of early-warning signals proves useful here too, where data would allow decision-making to be anticipatory in nature.

Higher-order. It is imperative that economic educators, who can make a difference to the future of Singapore, place emphasis on a curriculum where learning evolves, empowering future generations to be all-rounded, grounded thinkers. To achieve this, we must embrace higher-order, multi-disciplinary, systems-thinking in our economics curriculum. Future economists must be trained to analyse real-world political decisions and their underlying frictions—for example, unequal capital access, history, geopolitics and their affiliations, raw materials (or the lack thereof), monopolistic power—and to design policies that underlie and promote growth. Existing economic concepts should continue to feature in the classroom with but with a focus on linkages with other academic fields, as well as on applicability, encouraging students to think critically about the “economics”



of the world around them. Students should be provided with sufficient opportunities to adopt-and-adapt textbook solutions, applying them to solve real-world complex problems.

Bespoke. We are at a new stage in Singapore's history, where economic growth is no longer the be-all and end-all. To allow for a deeper understanding of what it truly means to be economically successful, students should be allowed increased experiential learning—via public sector internships, regional attachments and community engagement—which will help bridge the gap between “dry” economic theory and lived realities. As part of curriculum, students should study e.g. Buy Now Pay Later (BNPL), Private-Hire Vehicle (PHV) regulations, SME financing gaps, longevity risk for life insurance, etc. Existing eldercare and social mobility programmes, both local (e.g. Central Provident Fund, progressive wage model) and international, should be “torn apart, questioned and re-assembled” by students, which will greatly facilitate and deepen understanding.

Inclusive. Economics education of the future should instil social responsibility. In a capitalist world where market incentives take precedence over the needs of society, one must not forget that the recipients of good economic policy-making are ultimately our people, and the true measure of success is the Singapore that we





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create. We must prepare economists who are able to see beyond short-term returns, actively contemplating what would make our nation a more liveable, fair and inclusive space. Courses on ethics, environment and sustainability should become mainstream in the economics curriculum, so as to nurture a generation that values both efficiency and empathy.

Singapore's next 60 years should not be defined solely by quantitative metrics. The success of our future should also be judged on the qualitative, e.g. how well we have improved upward social mobility, cohesiveness and construct. By reimagining the study of economics, we can ensure that Singapore in 2085 remains vibrant and liveable, where every citizen—regardless of race, language or religion—can contribute and achieve.

A vibrant blue background filled with various white and orange icons representing different fields of study: mathematics (triangle, compass, calculator, bar chart), science (atom, magnifying glass, rocket, H₂O), biology (apple), geography (globe), history (hourglass), literature (book), and general education (graduation cap, pencil, question mark).

By **Mr Seah Chun Wu**

Background

The field of Artificial Intelligence (AI) has seen tremendous growth in the past five years. With the emergence of powerful Generative AI models¹ that form the backbone of popular consumer tools such as ChatGPT, Gemini, and Midjourney, AI usage has exploded with worldwide adoption expected to surge by 20% in 2025.² The use cases of AI are wide-ranging, from the most common AI chatbots to AI agents which can assist with everyday tasks. For many students like myself, AI chatbots are a treasure trove. Not only can we use them to query burning questions (and receive a generally satisfactory response in a matter of seconds), we can also generate discussion points for research work, along with many other functions. AI usage has become more commonplace in our education scene: A 2025 survey by CNA's Talking Point found that 84% of secondary school respondents use AI for their homework at least weekly.³ The Ministry of Education, too, recognises the value of AI and has begun enhancing the capabilities of the Singapore Student Learning Space with AI learning tools to support greater customisation of learning for students.⁴ AI is expected to fundamentally transform the education scene, affecting the way we learn and teach. Change is already knocking on our doors—PwC's 2025 AI Jobs Barometer notes that employer demand for formal degrees for all jobs is on the decline, especially for jobs which are exposed to AI.⁵ New questions have to be asked: What value does education, specifically higher education, hold in this digital era and how has AI shaped the role higher education plays in preparing students for productive careers and beyond?

Economic Theories

In economics, we commonly use two types of theory to explain the value of higher education: Signalling model by Michael Spence and Human Capital theory by Gary Becker. Higher education here is defined as education at a college or university where subjects are studied at an advanced level.⁶ Both theories touch on the productivity

1 Generative AI refers to deep-learning models that can generate high-quality text, images, and other content based on the data they were trained on (Martineau, 2024). Martineau, K. (2024, September 1). What is Generative AI?. IBM Research. <https://research.ibm.com/blog/what-is-generative-ai>

2 Global AI adoption to surge 20% and hit 378 million users in 2025. AltIndex. (2025, February 16). <https://altindex.com/news/global-ai-adoption-to-surge>

3 Paulo, D. A., & Othman, D. (2025, May 23). Teenage students often use AI to do homework, a survey finds, this is the impact on their grades. CNA. <https://www.channelnewsasia.com/cna-insider/secondary-students-using-artificial-intelligence-ai-homework-grades-singapore-5146911>

4 Artificial Intelligence in education. Ministry of Education (MOE). (2023, September 20). <https://www.moe.gov.sg/education-in-sg/educational-technology-journey/edtech-masterplan/artificial-intelligence-in-education>

5 AI linked to a fourfold increase in productivity growth and 56% wage premium, while jobs grow even in the most easily automated roles. PwC. (2025, June 3). <https://www.pwc.com/gx/en/news-room/press-releases/2025/ai-linked-to-a-fourfold-increase-in-productivity-growth.html>

6 Higher education | English meaning - cambridge dictionary. Cambridge Dictionary. (n.d.). <https://dictionary.cambridge.org/dictionary/english/higher-education>

of an individual, which is defined as the efficiency of utilisation of resources by an individual in the production of goods and services.

Signalling Model

Michael Spence, an American economist, published his paper titled “Job Market Signaling” in 1973, where he outlined how employers could use education qualifications to infer the quality of employees when their true abilities are difficult to observe.⁷ Spence presents a hypothetical scenario: Suppose there are two types of workers, good and bad ones. Good workers are productive in their work while bad workers are not. Assuming wages are proportional to productivity, employers would want to pay good workers more than bad workers. However, since it is difficult to determine the true quality of a worker, there is no viable way to tell if a worker is of a good or bad type. This is beneficial to bad workers who can free-ride off higher than proportional wages, but detrimental to good workers who deserve to be paid more due to their higher productivity. This brings in the value of higher education as a signal. Assuming that each unit of education costs less for a good worker than a bad worker (in terms of opportunity cost), a good worker is able to consume more units of education and hence obtain a higher educational qualification than bad workers. Employers are then able to use educational qualifications as a proxy for workers’ true quality, in order to assign wages more efficiently. A key assumption is that the costs of obtaining identical education qualifications is strictly lower for good workers than it is for bad workers, be it in terms of time, money, and effort spent. Spence concluded that even if education did not contribute at all to a worker’s productivity, it still has value for both workers and employers as a signal.

Human Capital Theory

The other theory of the value of higher education is the Human Capital theory by Gary Becker. In 1964, American economist Gary Becker published the first edition of his book titled “Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education”. Becker’s theory of human capital views education as an investment that raises the productivity of workers and hence their wages.⁸ Becker defined human capital as “activities that influence future monetary and psychic income by increasing resources in people”. This included education and training.

⁷ Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, 87(3), 355–374. <https://doi.org/10.2307/1882010>

⁸ Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. National Bureau of Economic Research.

Under the Human Capital theory, an individual will invest in education under the assumption that it will raise his productivity and so he can reap returns in the form of higher wages, since wages are assumed to be proportional to productivity in a competitive labour market. Productivity is raised as education is assumed to imbue individuals with certain meta-skills and capabilities that would enable them to perform more efficiently in the workforce. Key assumptions are made here: Individuals have to be rational in deciding to pursue education by weighing their marginal benefits and marginal costs. There can also not be any major barriers preventing optimal consumption of education (such as credit limits). Finally, education must enhance a worker's productivity to an extent.

Uses of AI

With the advent of AI, numerous implications occur in both Spence's Signalling model and Becker's Human Capital theory. First, let us examine the present use cases of AI at higher education institutions. The obvious would be the use of Generative AI by students and educators alike to generate content, be it to answer questions or



to create course materials, etc. Another use case would be the creation of chatbots trained on source materials which could serve as a tool for personalised learning. Moreover, many universities and educational institutions have also adopted various AI tools, such as automated essay scoring and robo-proctoring, or even AI-assisted peer review of research papers.

Implications for Signalling Model

Focusing on Spence's Signalling model, it is noted by Spence himself that signalling could inflate higher education degrees into a credential arms race. AI could exacerbate this by allowing students, be it those of low productivity or high productivity, to produce decent quality work easily. This directly challenges the premise of the Signalling model, that less productive individuals find it more difficult, due to higher opportunity costs, to obtain equivalent educational qualifications compared to more productive individuals. Specifically for higher education, less productive individuals must find it more difficult to obtain university degrees, obtain better classes of honours degree (e.g. first class honours), or even to enter better universities and colleges. Yet, AI can be used (or misused) by less productive individuals to generate decent quality content for their coursework and projects, allowing them to obtain higher scores at a lowered opportunity cost. Effectively, the difference in opportunity costs between more productive and less productive individuals are reduced, or even levelled, allowing less productive individuals to obtain educational qualifications at a level close to or identical to that of more productive individuals. This means that less productive individuals can "fake" their signals and disguise themselves as individuals with high productivity, armed with their degrees obtained with the unethical use of AI.

Cheating with AI

Indeed, this problem has surfaced in recent times, with cases of cheating using AI emerging in our local universities.⁹ Lecturers and professors alike lament the elusiveness of AI generated work, which is difficult to distinguish from human generated content.¹⁰ This is especially so if the work was purposefully modified to evade AI detection tools. With the pervasiveness and convenience AI brings, it is likely that the trend of AI usage will continue to rise. If no concrete method is

9 Chan, G. (2025, July 3). Is Ai cheating on the rise? few cases reported by s'pore universities, but experts warn of risks. The Straits Times. <https://www.straitstimes.com/singapore/is-ai-cheating-on-the-rise-few-cases-reported-by-spore-universities-but-experts-warn-of-risks>

10 Hwee Min, A. (2025, July 8). Trying to catch students using ai a "lost cause", Singapore University Professors Say. CNA. https://www.channel-newsasia.com/singapore/nus-ntu-ai-cheating-plagiarism-misuse-university-5220781?cid=WAcna_09062023

Evidence has shown that abuse of AI leads to a litany of problems, such as reduced critical thinking skills and decision-making capabilities.

present to detect AI usage, students will be able to easily use AI to cheat in their coursework and even their examinations, diminishing the value of degrees and educational qualifications as an effective signal for an individual's productivity.

Implications for Human Capital Theory

On Becker's Human Capital theory, it is clear that higher education plays an important role to build up an individual's capabilities, be it their communication skills, problem solving skills, etc., in order to improve their productivity. Such skills are developed through the completion of coursework, projects, assignments, and examinations. However, if AI is used misappropriately by an individual, such as using Generative AI to complete assignments, the individual stands to benefit less from the improvements in his skills and capabilities. In fact, over-reliance and inappropriate use of AI could have a negative impact on an individual's capabilities. Evidence has shown that abuse of AI leads to a litany of problems, such as reduced critical thinking skills and decision-making capabilities.¹¹ Given the attractiveness of using AI in terms of ease and function, less-principled individuals might very well be tempted to rely on AI to complete their coursework, diminishing the value of education as an investment that raises productivity. This is not an isolated observation either, with numerous articles reporting on the same matter. In fact, a piece by Channel News Asia in July 2025 called attempts to catch students using AI a 'lost cause', as its use has become too widespread and prevalent.¹²

Improper AI Usage in Institutions

Furthermore, many universities and colleges have also jumped on the AI bandwagon and started to adopt the use of AI in areas such as development of course materials

¹¹ Zhai, C., Wibowo, S., & Li, L. D. (2024, June 18). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: A systematic review - smart learning environments. SpringerOpen. <https://slejournal.springeropen.com/articles/10.1186/s40561-024-00316-7#Bib1>

¹² Hwee Min, A. (2025, July 8). Trying to catch students using ai a "lost cause", Singapore University Professors Say. CNA.



or even to grade student assignments. Whilst AI assistance has provided gains in efficiency, its effect on student's development and learning is unclear. In fact, improper AI usage by lecturers to grade assignments has led to student complaints about the lack of personalisation and relevance in AI-generated comments and frustration that lecturers are not paying due attention to their submitted work.¹³ In addition, AI is also used by some educators to generate materials and assignments. Whilst such AI usage is not necessarily detrimental, it requires appropriate modifications and quality assurance to be carried out by the educators themselves. What is harmful here is the misuse of AI by ill-equipped or poorly trained educators which could diminish the quality of content being produced and sent to students. If the professors and lecturers are unable to utilise AI efficiently and effectively, it compromises on the quality of education provided to students, which has harmful consequences on their learning outcomes, and hence diminishes the value higher education plays in improving productivity.

¹³ Al-Sibai, N. (2025, April 20). Hypocrite teachers are telling students not to use AI while using it to grade their work. Futurism. <https://futurism.com/teachers-using-ai-grading>

With studies showing a rapid shift in employers' requirements for future job candidates and research indicating a mismatch in skills of new graduates and current skills being demanded for, higher education needs to reform or risk being left behind in the age of AI.

Value of Higher Education

The value of higher education seems unclear in the face of AI emergence, with several ramifications on the two traditional economic theories presented. With studies showing a rapid shift in employers' requirements for future job candidates and research indicating a mismatch in skills of new graduates and current skills being demanded for,¹⁴ higher education needs to reform or risk being left behind in the age of AI. Fortunately, the road ahead is not as murky as it might seem. From the previous paragraphs, it is clear that misuse and over-reliance of AI is the root cause of the implications for both theories. In Spence's Signalling model, misuse of AI to cheat allows less productive individuals to falsify their capabilities and present a 'fake' signal. In Becker's Human Capital theory, over-reliance and improper usage of AI lowers the efficacy of education to train individual's meta-skills and abilities, lowering the returns to education as an investment that raises productivity. It is obvious then that the problem lies not in AI itself, but rather the way AI is being used.

Short-term Solutions

In the short run, it is integral that AI literacy is raised in educational institutions, not only for faculty but also for students. Students and educators alike should be educated on the appropriate and meaningful use of AI in their work, and be properly equipped with the right AI tools. Furthermore, it is imperative that school administration and staff do not shun AI and attempt to crack down on AI usage, as it is unfeasible and simply unwise, given the capabilities and potential that AI

¹⁴ Brown, E. (2025, January 21). New survey reveals traditional undergraduate education is not preparing students for the workforce . Hult International Business School. https://www.hult.edu/blog/wi_skills_survey/

holds. By correcting the way we interact with AI, higher education can still play a strong role in developing a student's abilities and act as an effective signal for student's productivity.

Long-term Goals

In the long run, we need to reevaluate the way we award educational qualifications and reassess the way students are graded in classes. The concept of micro-credentials and stackable learning comes to mind. It has become increasingly popular, accelerated by the rise in demand for technology and AI skills. Micro-credentials are industry or institution-recognised certifications that focus on specific skills and competencies by assessing practical work and rewarding training hours,¹⁵ while stackable learning is a flexible approach to learning whereby a learner completes smaller, modular learning units to build up to a larger qualification (e.g. a degree). In fact, some colleges and universities already offer some iteration of stackable learning, such as the Stackable Programmes by the Institute of Systems Science at the National University of Singapore. Micro-credentials and stackable learning allow for a more skill-based learning, something that is less substitutable by AI, whilst developing demanded capabilities in students, raising their productivity. On top of that, micro-credentials, alongside degrees, can act as a hybrid signal of an employee's capabilities and skill sets to employers. In addition, assessments and tests should be redefined to reward higher-order skills that AI cannot easily replicate, such as critical thinking and creativity.

Final Thoughts

The value of higher education is being altered and shaped by AI. In the face of change, we cannot afford to bury our heads in the sand and ignore the vast potential that AI brings. We have to be proactive in our approach and be progressive in our implementation. For students like myself, it is prudent for us to educate ourselves on the capabilities of AI, deepening our understanding of its abilities, use-cases, and ethics. As former Education Minister Chan Chun Sing puts aptly: "If we harness [AI] well, and we manage it well ... it will allow us to transcend our constraints of old, to ride the next S-curve of economic growth."¹⁶

¹⁵ Micro-credentials. Temasek Polytechnic. (n.d.). <https://www.tp.edu.sg/schools-and-courses/adult-learners/all-courses/micro-credentials.html>

¹⁶ Speech by Minister Chan Chun Sing at Leading the Era of AI. Ministry of Education (MOE). (2024). <https://www.moe.gov.sg/news/speeches/20240306-speech-by-minister-chan-chun-sing-at-leading-the-era-of-ai>



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