

# Singapore's Journey in Preparing Students for a Fast-Changing Global Landscape: The A-Level Curriculum and Examinations

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## ABSTRACT

Today, education systems need to prepare students for a rapidly globalising world where current content and skills would be rendered irrelevant with changing technological, economic, social and demographic trends. The workforce of the future needs individuals with capacity to acquire new competencies and adapt quickly to shifting landscapes. In Singapore, education and investment in human capital are important national priorities given our small population and limited natural resources. The Singapore education system aims to bring out the best in each child by providing a holistic education, diverse education pathways, flexibility and choices, and promoting lifelong learning. Against the above backdrop, this paper focuses on how Singapore's A-Level curriculum and examinations prepare students to be future-ready. Notably, the A-Level curriculum prepares students for the knowledge-based economy by providing a holistic education that balances life skills and content mastery and a broad-based education with flexibility of options, placing greater emphasis on 'disciplinarity' of academic subjects, and developing 21<sup>st</sup> century competencies in students. To support a forward-looking curriculum, the A-Level examinations are continually revised to ensure close alignment with curriculum developments. In recent years, examinations are increasingly characterised by assessment of higher order thinking skills and inclusion of alternative modes of assessment including e-examinations. Responding to the fast-changing global landscape has brought about both challenges and opportunities moving forward. Singapore has taken the approach of promoting holistic education and shifting focus away from an examinations-driven culture. To achieve higher levels in fidelity of implementation, a systemic approach to holistic education has been taken to re-shape mindsets and norms through deliberate and calibrated shifts in policy over time. There has been a broadening of the definition of success to value each child for who they are rather than what they could achieve and a reframing of meritocracy from one that is based on academic qualifications to one that is based on performance through life. School systems at various levels are aligned to ensure systemic delivery of holistic education. Polytechnics and universities are also taking into consideration applicants' passion, aptitude and relevant experience via aptitude-based admissions. Beyond schools, the SkillsFuture movement promotes life-long learning for Singaporeans. Going forward, the examinations will be continually reviewed to ensure that they remain relevant and aligned to the education policies. The nexus between A-Level examinations and university admission will continue to be important but will evolve to include more holistic admission processes to bring in students with aptitude and passion for learning.

## 1. INTRODUCTION

How can education systems better prepare students for the future workforce? In the 21<sup>st</sup> century, societies and individuals are having to cope with an unprecedented scale and speed of change brought about by key driving forces such as globalisation, technological breakthroughs and demographic shifts. Today, we are at the beginning of a Fourth Industrial Revolution, a phenomenon characterised by Klaus Schwab (2016), founder of the World Economic Forum, where new technologies such as genetics, artificial intelligence, robotics, nanotechnology and biotechnology are fusing the physical, digital and biological worlds and transforming disciplines, economies and industries. As the Fourth Industrial Revolution gains

momentum, human workers in some industries would be replaced by new technologies resulting in disruptive labour market changes, with an estimated loss of more than 5 million jobs by 2020 (World Economic Forum, 2016). Presently, employers worldwide are grappling with a 'skills gap' as new technologies frequently require specific new skills that are not taught in schools and not supplied by labour markets (Bessen, 2014). Consequently, education systems are under pressure to ensure that curriculums are relevant and students are future-ready. Notably, the Organisation of Economic Co-operation and Development (OECD) has projected the future of education in 2030, where schools must prepare students for accelerating changes in economy and society, for jobs that have not been created, for technologies that have not been invented, and to manage social tensions that have not been anticipated (OECD, 2017).

Policy-makers need to continually rethink education policies and update core curriculums and competencies. A disconnect is showing up between a largely content-driven curriculum and increasingly skills-based world of work in the 21<sup>st</sup> century (Kamath, 2017). According to a popular estimate cited in the Global Challenge Insight Report (World Economic Forum, 2016), nearly 50% of subject knowledge acquired in the first year will become outdated by the final year of a four-year technical degree. The report projected the following:

- More than a third of the desired core skill sets of most occupations will comprise skills not yet considered crucial to the job today.
- More than a third of all jobs will require complex problem-solving as a core skill.
- Social skills such as persuasion, negotiation, emotional intelligence will be in higher demand across industries than narrow technical skills.
- New content skills (which include ICT literacy and active learning), cognitive abilities (such as creativity and mathematical reasoning) and process skills (such as active listening and critical thinking) will be a growing part of the core skill requirements for many industries.

(World Economic Forum, 2016)

Schwab (2016) characterised this revolution as one of 'great promise' bringing connectivity across people and organisations, and solutions to environmental, economic and social problems. He also described this revolution as one of 'great peril', bringing asymmetry of power, security concerns, economic inequality and social fragmentation. To this end, he called for countries to put people at the forefront of development and emphasised that new technologies are tools made by people for people. This is a call that education systems need to urgently respond to, as a well-educated workforce would produce positive multiplier effects in a country's political, economic, social and environmental spheres.

## **2. THE SINGAPORE EDUCATION SYSTEM**

The Singapore education aims to bring out the best in every child by enabling each child to discover his talents, realise his potential, and develop a passion for learning that lasts throughout his life. To help students thrive in a fast-changing world, over the past few years, the Ministry of Education has introduced several initiatives to promote holistic education, particularly values education and character development, and to rebalance the over-emphasis on academic pursuit and examination grades (Heng, 2013; Ng, 2016). In addition, a framework to cultivate 21st century competencies in students was launched in 2010 (see **Annex A**). These competencies underpin the holistic education that our schools provide to better prepare our students for the future and they are embedded in both the academic and non-academic curricula, such as Character and Citizenship Education and Co-Curricular Activities. In recent times, our Minister of Education (Schools) Ng Chee Meng also shared broad directions for schools to foster the 'joy of learning' by changing teaching practices (Ng, 2017).

Singapore's education system comprises three key stages: 6 years of primary school education; 4 or 5 years of secondary school education; followed by post-secondary education via the 2-year General Certificate of Education (GCE) Advanced Level (A-Level) programme at the Junior Colleges, 3-year Diploma programme at the Polytechnics or 2-year Certificate programme at the Institute of Technical Education. Of the Primary 1 cohort, approximately 28% of students progressed to Junior Colleges, another 47% of students to Polytechnics, and 25% to the Institute of Technical Education in 2015 (Ministry of Education, 2016).

Over the past years, an increasing number of high performing secondary students<sup>1</sup> have opted for a polytechnic diploma programme due to its more applied nature. The diploma programme allows these students to focus on their chosen specialisations such as diploma of Biomedical Science, Engineering Science, Digital Animation and Aeronautical Engineering. Students from the polytechnics who do well can progress to universities<sup>2</sup>. About 70% of our A-Level students and 20% of our polytechnic students progress to publicly-funded universities after graduation (The Straits Times, 2016).

At the end of each key stage of learning, national examinations<sup>3</sup> serve to assess learning of students and certify achievement, and examination aggregate grades are used for placement of students in courses and posting them to schools and higher education institutions.

Against the above backdrop, this paper focuses on how Singapore's A-Level curriculum and examinations prepare students to be future-ready, including the challenges and opportunities moving forward.

### **3. THE ADVANCED-LEVEL (A-LEVEL) CURRICULUM**

To prepare students for the knowledge-based economy and fast-changing world of the 21<sup>st</sup> century, the A-Level curriculum emphasizes holistic education, breadth of learning, multidisciplinary learning and the capacity to learn independently. Students are encouraged to think critically and innovatively and develop their communication skills. The key features of the curriculum are as follows (see **Annex B**):

*A holistic education that balances life skills, knowledge skills and content mastery*

The A-Level curriculum provides a holistic education through life skills in the non-academic curriculum, knowledge skills in General Paper and Project Work, and firm grounding in content disciplines.

At the core of the curriculum, students develop values and skills that take them through life as responsible and active citizens via non-academic programmes such as Co-Curricular Activities, Character and Citizenship Education and Community Involvement Programme. Students also participate actively in Co-curricular Activities and outdoor adventure expeditions. Every junior college has a range of in-house programmes that nurture leadership and strength of character.

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<sup>1</sup> These students are eligible for both A-Level and polytechnic diploma programmes.

<sup>2</sup> Students who do very well (e.g., meeting course GPA requirements) and have relevant course pre-requisites are eligible to be admitted into university degree programme at Year 2.

<sup>3</sup> Students from the Primary Schools, Secondary Schools and Junior Colleges will sit for the national examinations administered by the Singapore Examinations and Assessment Board. Students from Polytechnics and Institute of Technical Education will sit for examinations administered by the respective institutions.

The knowledge skills subjects develop students' thinking, process and communication skills. The content-based subjects in H1 or H2 or H3 Level give students grounding in subject disciplines in three areas: Languages, Humanities & the Arts, and Mathematics & Sciences. A H1 subject is half of a H2 subject in terms of curriculum time. H3 subjects build on H2 subjects in knowledge and skills, involving the study of more advanced content in the curriculum, a research module or a module offered by the university, and offer opportunities for in-depth learning. Examples of H3 subjects are the Science Research programmes and the Humanities and Social Sciences Research programme offered in partnership with the National University of Singapore; and the Molecular Biology and Semiconductor Physics and Devices programmes, with the Nanyang Technological University.

*A broad-based education with breadth of learning and flexibility of options*

A broad-based education with emphasis on breadth of learning and flexibility of subject options is provided. Close to 75 subjects are offered in the A-Level examinations (see **Annex C**). A typical student will offer H1 General Paper, H1 Project Work, H1 Mother Tongue Language, one H1 content subject and three H2 content-based subjects (see **Table 1**). To prepare students for multidisciplinary learning in university education, they are required to study at least one subject outside their area of specialisation known as a contrasting subject. For example, a student specialising in the Humanities & the Arts disciplines is required to take at least one contrasting subject from the Mathematics & Sciences disciplines, and vice versa.

Table 1: Typical subject combination at A-Level Curriculum

	<b>Subjects/Programmes</b>	<b>Remarks</b>
Life Skills	Co-Curricular Activities Values in Action Programme Character and Citizenship Education	Non-examinable
Knowledge Skills	H1 Mother Tongue Language (Chinese, Malay or Tamil) H1 General Paper H1 Project Work	Compulsory for all students Examinable
Subject disciplines	H1, H2 or H3 level Typically, a student offers one H1 content-based subject and three H2 content-based subjects (At least one subject is from a contrasting discipline.)	Examinable (Grades for H3 subjects are not counted towards the university admission score)

*Greater emphasis on 'disciplinarity' of academic subjects*

Recent A-Level curriculum reviews have focused on the 'disciplinarity' of the subjects, rather than the study of content per se. Disciplinarity refers to the essence of the discipline -- the nature of knowledge, and ways of thinking and knowing in the discipline. The Science syllabuses (Physics, Chemistry and Biology) articulates the 'Practices of Science' where Science as a discipline is more than acquisition of a body of knowledge (e.g. scientific facts, concepts and theories); it involves understanding the nature of scientific knowledge, demonstrating science inquiry skills, and relating science and society. Students learn to integrate knowledge and understanding from different areas of the syllabus. They are required to understand principles and concepts and apply them in real life or novel situations. The Geography syllabus also emphasises the nature of the discipline as geographical inquiry is framed by six geographical concepts (environment, place, process, scale, space and time, and system). These concepts underscore the motivations behind different sets of questions

that interest different groups of geographers. As topics integrate the study of both physical and human geography, it allows for understanding of how the physical environment affects human lives and how human decisions impact on the physical environment. Having a strong grounding in the disciplines is important as multidisciplinary work is predicated on the ability to draw from disciplinary sources and methods to redefine complex problems and formulate innovative solutions.

#### *Developing 21<sup>st</sup> Century Competencies*

The 21<sup>st</sup> century competencies -- critical and inventive thinking; communication, collaboration and information skills; civic literacy, global awareness and cross-cultural skills -- are embedded in the teaching of individual subjects. In particular, H1 Project Work, a compulsory subject for all students, provides opportunities for students to develop 21st century competencies (Chong & Leong, 2014; Yue & Chow, 2015). Students, in groups of 4 to 5, work on a project based on a given theme over 9 months. Each group defines a project focus, choose a current real-life issue to investigate and propose strategies to address the issue. In the process, they would need to make links between knowledge from various areas of learning (i.e. interdisciplinary in nature) in a real-world context. At the end of the project, they are required to present their findings in both written and oral modes. The grade awarded for the subject reflects the importance of collaboration as equal weighting is given to both individual and group contributions.

#### **4. The A-LEVEL EXAMINATIONS**

Our examinations are standards-referenced – comparable examination standards are maintained across years and across cognate subjects. Students' achievements in examinations are recognised through letter grades A, B, C, D, E and Ungraded. During grading, multiple sources of evidence such as paper difficulty, quality of students' responses and cohort quality etc. are taken into consideration. For example, if evidence suggests that the test is slightly more difficult than previous years' tests, the grade thresholds will be lowered appropriately to maintain comparable standards. This ensures that the achievements of each cohort are given fair consideration from year to year and also across subjects. There are also rigorous processes in place to ensure that our test development and delivery adhere to key principles of assessment, viz. validity, reliability and fairness.

The A-Level examinations are continually revised to ensure close alignment with curriculum developments, and as such, support a forward-looking curriculum. In recent years, examinations are increasingly characterised by the following:

##### *Greater emphasis on higher order thinking skills*

Firstly, examinations require students to go beyond rote learning to apply higher-order thinking skills in real world contexts. Students are required to use disciplinary thinking and inquiry skills in questions that require analysis, synthesis, evaluation and decision-making. The 'synoptic' nature of examination questions also requires students to make connections across topics and integrate knowledge in order to respond to both familiar and unfamiliar contexts that are given. For example, in the Mathematics and Sciences examinations, students are required to apply and integrate concepts, reasoning skills and problem-solving skills learnt across various topics in application questions on real-world contexts. In the History examination, case studies require students to construct historical explanations that demonstrate an understanding of historical concepts such as change and continuity and cause and effect. Students are required to bring together perspectives/issues and discuss critically how multiple perspectives/issues

affect each other. In the Geography examination, data response questions provide students with a specific context (e.g. a fieldwork exercise to ascertain flood risk) and a range of resources (e.g. data collected on velocity of rivers) and require students to apply knowledge and skills related to geographical investigation based on the context given.

### *Alternative modes of assessment*

Secondly, appropriate alternative assessment modes are used to ensure that examinations are fit for purpose. Apart from written examinations, a range of assessment modes is used. The use of coursework assessment allows assessment of a range of 21<sup>st</sup> century competencies. For example, the H1 Project Work requires students to work in groups and use a range of skills such as knowledge application, communication, collaboration and independent learning over a course of time. Students are required to submit a written report, a group project file and to give an oral presentation. Science Practical Examinations are used to assess students' science practical and investigative skills. Listening Comprehension and Oral examinations are used to assess oral-aural communication skills in H1 Mother Tongue Languages. Other assessment modes include independent study and research essay<sup>4</sup> for H2 China Studies, H2 Knowledge and Inquiry, and H3 History.

### *E-examinations*

Thirdly, in line with the use of Information and Technology as an important 21<sup>st</sup> century competency, e-examinations have been introduced in our examination system. For some of our Mother Tongue Language (MTL) written examinations, students use computers to compose emails, blogs and forum commentaries, synthesizing information from multiple data sources provided on-screen. This reflects a more authentic process as written communication today is done on computers, internet, smartphones rather than on paper. For H1 MTL oral examination, students are assessed 'live' by a pair of oral examiners on both oral presentation and discussion. Video clips depicting real-life situations or current affairs are used as stimuli to make oral discussion more authentic and meaningful for our students.

### *University Admission*

Currently, the selection of applicants from the Junior College<sup>5</sup> into the University is based largely on the University Admission (Grade-aggregate)<sup>6</sup> Score. Subjects that count towards the University Admission Score [90 points] are as follows: H1 General Paper [10 points]; H1 Project Work [10 points]; three H2 content-based subjects [20 points each] and one H1 content-based subject [10 points], of which one must be a contrasting subject.

University faculties have the option of assigning a Faculty Score via additional criteria such as interviews, portfolios, reasoning or aptitude tests. Admission into such faculties is based on the Combined Score comprising the University Admission Score and Faculty Score. Applicants who do not meet the cut-off point for the course applied to, but who demonstrate aptitude for the course and possess a minimum level of academic competence to cope with the rigours of the course, may be admitted into the university via the Discretionary Admissions

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<sup>4</sup> For independent study or research essay, students write an extended essay over 6 months based on an approved proposal by the examination authority.

<sup>5</sup> Applicants from Polytechnics will be considered for admission into Universities based on the competitiveness of their Polytechnics and their GCE O-Level results. For example, for NUS and NTU, the weightage is 80% for Polytechnic results and 20% for GCE O-Level results.

<sup>6</sup> The grades for A-Level subjects are A, B, C, D, E and Ungraded (U). For H2 level, the maximum is 20 points for A grade. For H1 level, the maximum is 10 points for A grade.

Scheme. Students may be considered on account of special strengths and talents, such as outstanding achievement in co-curricular activities, service to the community, H3 subjects and other pursuits.

The recent review of university education saw the expansion of the publicly-funded university sector to cater to a wider spectrum of students. Notwithstanding this, there is a strong commitment to maintain quality and standards to ensure that degrees will not be devalued and graduates will not become unemployed or underemployed. (Wong, 2012). To increase the number of university places, two new universities have been set up: the Singapore Institute of Technology focuses on applied learning; and the Singapore University of Social Sciences, on the social sciences and socially related careers. In total, there are six publicly-funded universities offering a diverse range of degrees with different niche areas for students to pursue their interests.

Concomitantly, the number of polytechnic students progressing to university education has increased, with 1 in 3 local university students admitted in 2015 being a polytechnic student (The Straits Times, 2016). As such, students who could better benefit from the applied nature of polytechnic education (instead of pursuing an academic pathway through the junior colleges) could continue to pursue their studies at a higher level in the universities.

Progressively, the university cohort participation rate has increased from 25% in 2010, to 30% in 2015 and 35% in 2017. This will be further raised to 40% by 2020. (Ong, 2017) This meant that 4 in 10 students from primary one cohort will pursue a degree in the publicly funded universities.

## **5. CHALLENGES AND OPPORTUNITIES MOVING FORWARD**

Similar to China, national examinations in Singapore, particularly the A-Level examinations, are high-stakes as they have consequences for an individual's opportunities and future career. Examinations are often blamed for the overly competitive culture, increasing levels of stress and narrowing teaching and learning. As a pragmatic society, teachers and students will continue to be examinations-driven and parents will continue to value paper qualifications. In reality, any changes in examinations will no sooner be mastered by schools and the drilling of students to 'ace' in examinations will continue. Notwithstanding this context, Singapore is promoting holistic education and development to prepare our students for the fast-changing global landscape. In the drive for higher levels in fidelity of implementation, a systemic approach to holistic education is taken to re-shape mindsets and norms through deliberate and calibrated shifts in policy over time.

### *Reshaping Mindsets: Broadening the definition of success and reframing meritocracy*

As the education system is reflective of society at large, it is not possible to have broader definitions of success in education without our society accepting broader definitions of success in life. At a broader societal level, socio-cultural mindsets and expectations on educational achievements impact what counts in schools. Changing attitudes and behaviours towards examinations is about changing what counts. In 2013, the then Education Minister Heng Swee Keat called for Singaporeans to rethink what constitutes success. He advocated broadening the definition of success so that each child could be valued for who they are, rather than what they could achieve. To this end, the Ministry has been guided by a few core beliefs on what constitutes success for the child: one, every child can learn and find success in learning, regardless of starting point; two, every child is different and will succeed in different ways;

three, children will need different attributes to succeed in the future as the world changes (Heng, 2013).

The principle of meritocracy, where social mobility is premised on an individual ability, achievement and performance, is perceived to have contributed towards a highly competitive culture for academic qualifications in Singapore. In 2014, Deputy Prime Minister Tharman Shanmugaratnam urged Singaporeans to look beyond early qualifications as a student's future should not be determined solely by what is attained at age 18 or 24 via examinations. In reframing meritocracy from one that is based on qualifications to one that is based on performance through life, he explicated important life skills such as developing deeper know-how through practice, collaborating as a team and taking the heat together, or the ability to look for opportunity in the face of challenge (Shanmugaratnam, 2014).

In tandem with broadening the definition of success, policy changes congruent with the importance placed on holistic education, 21<sup>st</sup> century competencies and lifelong learning are systematically implemented in the education system.

#### *Aligning school systems at primary and secondary levels: Systemic delivery of holistic education*

At all levels of education, measures were taken to mitigate the over-emphasis on examination and to help enhance the delivery of holistic education. At primary level, modifications were made to school assessment via age-appropriate holistic assessments to rebalance the acquisition of knowledge with the development of skills and values. In fact, to help children ease into schooling, there are no examinations at Primary 1. The aggregate T-score for the Primary School Leaving Examination will be replaced by wide scoring bands from 2021 to reduce overly fine differentiation of students' achievements based on examination performance.

At secondary level, all schools are being supported by the Ministry to develop rich and distinctive learning programmes so as to create a vibrant secondary school landscape and to realize the vision that 'every school is a good school'. These measures will alleviate parental pressure of getting their children admitted into schools with strong academic reputations. Many of these programmes focus on developing students' 21<sup>st</sup> century competencies. The Direct Secondary School Admission scheme, which allows for secondary schools to admit students based on an area of talent in sports, arts, etc. is also being tweaked so that a greater range of non-academic attributes such as resilience, character and leadership are recognized and hence encouraged.

The recognition of schools has also been re-aligned. For example, the practice of naming top scorers in examinations ceased and banding of secondary schools based on academic results was abolished. The re-alignments have been made for the intent of broadening our definitions of success. All these efforts were aimed to engender a change of mindsets for the public to see examinations merely as a checkpoint in a child's learning journey before the next phase of education rather than as the 'be all and end all'.

#### *Aligning curriculum at pre-university level*

At the pre-university level, curriculum reviews ensure that the H1 and H2 curriculum are right-sized in terms of depth and breadth of content, in order to allow for the 21<sup>st</sup> century skills, particularly thinking and innovation skills as well as communication skills to be infused into the curriculum. Students' involvement in Co-Curricular Activities, the Community Involvement Programme and other pursuits are reported in the School Graduation Certificate issued by the Ministry of Education and could be considered by the local universities for admission.



### *Aligning post-secondary admissions: Aptitude-based admissions*

In 2016, the Ministry of Education introduced the notion of ‘aptitude-based admissions’. Studies have shown that students who are admitted to polytechnics via Direct Polytechnic Admissions (DPA)<sup>7</sup> did better in their studies, had lower drop-out rates, and were more likely to embark on careers in the sectors for which they are educated and trained when compared to their peers with similar examination aggregate scores. Minister for Education (Higher Education), Mr Ong Ye Kung quoted from Confucius: “知之者不如好之者，好之者不如乐之者<sup>8</sup>” and explained that ‘if we are learning something we are interested in, we are more likely to stay curious and engaged. And if we stay curious, we are likely to make that subject a lifetime pursuit’ (Ong, 2016). From 2017, discretionary admission intake for University will be increased to 15%. While admissions based on a single examination aggregate score is objective and transparent, a judgement call is however, needed in aptitude-based admission when other measures of student ability are introduced. Local universities, in tandem with the increase in discretionary admissions, have refined the process of evaluating and admitting students, and will consider the applicants’ passion and aptitude and relevant experience for the course applied.

### *Aligning university education: a grade-free system for the first year*

As part of a broader shift away from academic grades and towards holistic education, the National University of Singapore, introduced in 2014 a grade-free system for the first year, where freshmen would be able to write off grades of some modules in their first year. The purpose is to allow for a successful transition into the academic and social culture of university life in the first year as well as to change mindsets about grades and pursuit of learning. Consequently, it was found that undergraduates became more adventurous in choosing modules that are outside of their discipline and yet their academic performance was not compromised (NUS Provost Office, 2016).

### *Alignment beyond Schools: The SkillsFuture movement promoting lifelong learning*

In 2016, Singapore launched SkillsFuture, a national movement to enable all Singaporeans to develop to their fullest potential throughout life – whether schooling years, early career, mid-career or silver years, where resources are provided to help Singaporeans to move beyond competence to attain mastery of skills. SkillsFuture credits given to all Singaporeans aged 25 can be used to pay for a wide range of skills-related courses. A Skills Framework is co-created by employers, industry associations, unions and the government for the Singapore workforce. It provides information on employment, career pathways, occupations/jobs roles and emerging skills required for different jobs and training providers for the relevant programmes. SkillsFuture supports Singaporeans to take ownership of their career development and skills upgrading (SkillsFuture, 2017). As such, the next wave of development is to build a good system of continuing education and training throughout life.

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<sup>7</sup> Under DPA, students are admitted into Polytechnics through a range of measures, like interviews, write-ups and artistic portfolios beyond academic grades

<sup>8</sup> ‘Somebody who knows cannot match someone who wants to know, and somebody who wants to know cannot match somebody who loves to know’

## **6. CONCLUSION**

Singapore has a small population. Human capital is a precious resource. Our unique geographical, historical, political and socio-cultural contexts have produced different educational philosophies, policies and priorities for curriculum, pedagogy and examination. Singapore's journey in preparing our people for a fast-changing global landscape began with developing a student-centric and more future-oriented curriculum, where students are grounded in core values, acquire 21<sup>st</sup> century competencies through subjects and apply their learning in real-world contexts.

Over the past decade, systemic changes have been made to promote holistic education and rebalance the over-emphasis on examination grades at all levels. Much effort has been put into coordination, communication and engagement involving different stakeholders to ensure policy coherence and fidelity of implementation.

Going forward, we need to continue to review and refine our examinations to ensure that they remain relevant and aligned to the curriculum and education policies. The nexus between A-Level examinations and university admission will continue to be important but will evolve to include more holistic admission processes to bring in students with aptitude and passion for learning.

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## Singapore's 21<sup>st</sup> Century Competencies Framework



Knowledge and skills must be underpinned by values. Values define a person's character. They shape the beliefs, attitudes and actions of a person, and therefore form the core of the framework of 21st Century Competencies. The middle ring signifies the Social and Emotional Competencies – skills necessary for children to recognise and manage their emotions, develop care and concern for others, make responsible decisions, establish positive relationships, as well as handle challenging situations effectively. The outer ring of the framework represents the emerging 21st Century Competencies necessary for the globalised world we live in. These are:

- Civic Literacy, Global Awareness and Cross-Cultural Skills
- Critical and Inventive Thinking
- Communication, Collaboration and Information Skills.

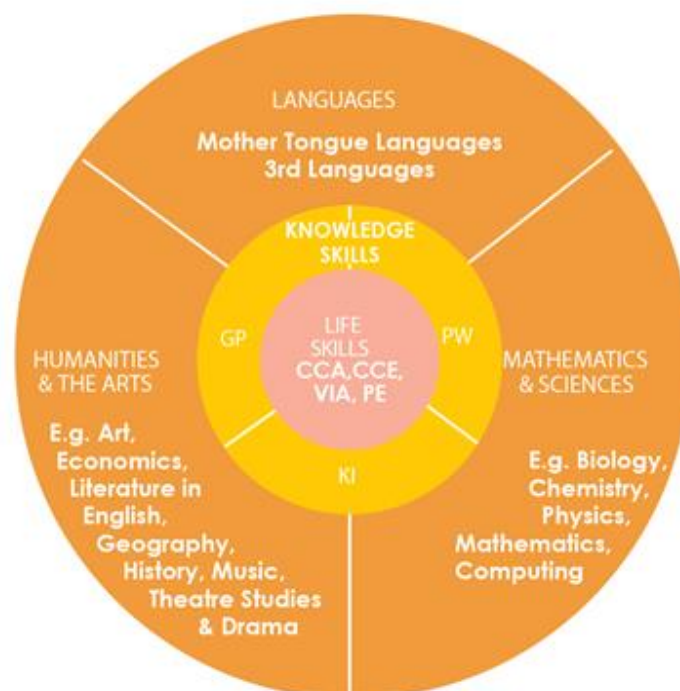
Together, these competencies will enable our young to capitalise on the rich opportunities of the new digital age, while keeping a strong Singapore heartbeat.

### Student Outcomes

The development of 21st Century Competencies will help our students to embody the Desired Outcomes of Education (DOE). These are attributes that educators aspire for every Singaporean to possess upon the completion of his formal education. The person who is schooled in the Singapore Education system has a good sense of self-awareness, a sound moral compass, and the necessary skills and knowledge to take on challenges of the future. He is responsible to his family, community and nation. He appreciates the beauty of the world around him, possesses a healthy mind and body, and has a zest for life. In sum, he is: **a confident person, a self-directed learner, an active contributor and a concerned citizen.**

Source: Ministry of Education, Singapore, 2017. Retrieved from:  
<https://www.moe.gov.sg/education/education-system/21st-century-competencies>

## Singapore's A-Level Curriculum Framework



**Life Skills:** The holistic curriculum of the school, including non-academic activities, helps to develop values and skills to take students through life as responsible and active citizens.

**Knowledge Skills:** Focuses on developing students' thinking, process and communication skills. These skills are also developed through content-based subjects.

**Content-based Subjects:** Gives students grounding in content disciplines in three different areas: Languages, Humanities and the Arts, Mathematics & Sciences. A Humanities and the Arts student will take at least one contrasting subject from the Mathematics and Sciences disciplines, and vice versa.

H1	H2	H3
H1 is half of H2 in terms of curriculum time	H2 is equivalent to A-Level subjects prior to 2006	H3 builds on H2 in knowledge and skills and provides opportunity for in-depth study. Students offering H3 subjects must offer the corresponding subject at H2 level.

Students typically offer a combination of subjects as follows:

Knowledge Skills	H1 Mother Tongue Language H1 General Paper H1 Project Work
Content-Based Subjects	One H1 content-based subject Three H2 content-based subject [At least one subject is from a contrasting discipline.]

Source: Ministry of Education, Singapore, 2004, 2017.

Retrieved from: <https://www.moe.gov.sg/microsites/cpdd/alevel2006/>  
<https://www.moe.gov.sg/education/pre-university/gce-a-level-curriculum>

## GCE A-Level: H1, H2, H3 Subjects

Disciplines	Subjects	H1	H2	H3
Knowledge Skills	General Paper	√		
	Project Work	√		
	Knowledge & Inquiry		√	
Languages	Chinese	√		
	Malay	√		
	Tamil	√		
	Bengali	√		
	Gujarati	√		
	Hindi	√		
	Panjabi	√		
	Urdu	√		
	French	√		
	German	√		
	Japanese	√		
Humanities & the Arts	Art	√	√	√
	Economics	√	√	√
	Geography	√	√	√
	History	√	√	√
	Literature in English	√	√	√
	China Studies in English	√	√	
	China Studies in Chinese		√	
	English Language and Linguistics		√	
	General Studies in Chinese	√		
	Translation (Chinese)		√	
	Chinese Language & Literature		√	√
	Malay Language & Literature		√	√
	Tamil Language & Literature		√	√
	Music		√	√
	Theatre Studies and Drama		√	
	Management of Business		√	
	French		√	
	German		√	
	Japanese		√	
	NUS Geopolitics: War & Peace			√
NUS Humanities & Social Science Research			√	
Mathematics & Sciences	Biology	√	√	√
	Chemistry	√	√	√
	Physics	√	√	√
	Mathematics	√	√	√
	Further Mathematics		√	
	Computing		√	
	Principles of Accounting		√	
	Essentials of Modern Physics			√
	Pharmaceutical Chemistry			√
	Proteomics			√
	NUS Modern Physics			√
	NTU Molecular Biology			√
	NTU Semiconductor Physics and Devices			√
	NTU Science Research			√
	NUS-Science Research			√

Source: Singapore Examinations and Assessment Board, 2017.