Futures of Education
for Industry 4.0 and Beyond

Hong Kong's response to UNESCO's global initiative

Report prepared for and on behalf of

UNESCO Hong Kong Association
Glocal Peace Centre

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Foreword

Dear readers,

The Futures of Education Forum was the first of its kind organised by the UNESCO HK Glocal Peace Centre. We invited opinion leaders in Technology and Business to exchange ideas with counterparts in the Education sector, to see how the education system in Hong Kong should get prepared for the changes that are imminently brought by Industry 4.0. All the key discussion items are now captured in this report for your easy reference.

I must thank Professor Samuel Leong, Ms Donna Buckland, Dr. Vincent Lee and members of the editing team for compiling this report.

Yours sincerely,

Eugene Fong
Chair, Futures of Education Forum, Organising Committee

Foreword

Thinking about the purpose of education, I recall the story of the three stonecutters from the writings of Peter Drucker, often hailed as "Father of Modern Management".

A man came across three stonecutters and asked them what they were doing. The first replied, "I am making a living." The second kept on hammering while he said, "I am doing the best job of stonecutting in the entire county." The third looked up with a visionary gleam in his eye and said, "I am building a cathedral."

Education cultivates the first two kinds of talents, but in considering the future of education , we must not lose sight of what is perhaps the most challenging task for sustainable development in this age of Industry 4.0 - building a shared vision for a world without boundaries.

Dr. Darwin Chen, SBS
President Emeritus, UNESCO Hong Kong Association

Messages from Partners

The University of Manchester Worldwide (UMW) Hong Kong is pleased to be a sponsor for the Futures of Education for Industry 4.0 and Beyond forum.

We believe this Report will be useful for ongoing engagement between the HK, regional and global partners. We look forward to future dialogue with colleagues in the education and business sectors to reimagine and remodel future education for an increasingly complex, uncertain and technologically advanced world.

Venus Cheung
Deputy Director, the University of Manchester Worldwide (UMW) Hong Kong

In today's rapidly changing world where digital literacy has played a crucial role in education, integrating information technology into teaching and learning creates refreshing study experiences, and helps cater for students' diversity. Yet, digital literacy is not merely technological know-how and digital skills. Living in a more advanced and complex era with dilemmas and uncertainties, competencies like flexibility, responsiveness, creativity and collaboration are becoming more important for positive and constructive transformations.

In the age of digital disruption, we need a wider range of ethical, social and reflective practices which serve as building blocks of our rights and responsibilities, social awareness, value judgment and so on. The future of education shall not be bounded by educating mind and skill, but educating the heart of students to cultivate in them good values and characters. This is what truly makes our world a better place. The fundamental challenges that technology poses to education should never be discounted for the sake of our future and our next generation.

Dr. Joseph Lee, GBS, OStJ, JP
President, Wofoo Social Enterprises

Acknowledgements

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青 年 發 展 委 員 會
Youth Development Commission

Acknowledgements

Forum Speakers

Keynote Speakers	Prof. Anthony Cheung, GBS, JP	Mr. Peter Mok
Panelists	Dr. Maggie Koong, BBS, JP	Mr. Tommie Lo
	Prof. Simon Shen	Mr. Dennis Shi
	Mr. Victor Kwok	Mr. Spencer Leung
	Mr. Arnett Edwards	

Organising Committee

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Introduction & context

This Report is an outcome of the Education Forum on Futures of Education for Industry 4.0 and Beyond held on 20 June 2020. The Forum supports UNESCO's Futures of Education initiative targeting 2050. The vision is for education that is fit for purpose. The focus of the forum, delivered online, was on how the future of education in Hong Kong and the Greater Bay Area could be re-imagined in an increasingly complex, uncertain and technologically advanced world.

Looking to 2050 and beyond, UNESCO launched the Futures of Education initiative in September 2019, seeking to reimagine how education and knowledge can contribute to the global common good, culminating in the Futures of Education 2021 Report.

This forum, Futures of Education for Industry 4.0 and Beyond, supports the UNESCO initiative by creating a platform to discuss how knowledge, education and learning in Hong Kong and the Greater Bay Area need to be reimagined in a world of increasing complexity, uncertainty, and precarity.

The Futures of Education for Industry 4.0 and Beyond forum brought together leaders from the education and business sectors, and more. Organised by UNESCO HK Association Glocal Peace Centre, the event was sponsored by University of Manchester Worldwide (UMW) Hong Kong, Hong Kong Science and Technology Parks and Home Affairs Bureau.

The findings of the Futures of Education Hong Kong pre-Forum survey – which shows how Hong Kong people think Industry 4.0 will change the local educational landscape – were also presented.

Chapter 1
Summary of keynote speakers

Professor Anthony Cheung, GBS, JP,
keynote speaker for the Forum pointed out that the "smart city" is driving away old ways of social interaction and sense of belonging. As the modern society is a "risk society", people should be mindful of the risks that go with IT, including financial risks, eco-risks, and digital wars and terrorism. Although the world will certainly be transformed by new technologies, "the importance of the soul — values and virtues — should remain vital to our educational process".

For education, he highlighted that the "pedagogy of the past" cannot equip students with the skills and competencies to face and adapt to the fast-changing world. In the world of new IT, "information is power", but some have more information and more power than others. The question we must ask is "whether we have all tried hard enough to achieve a better balance for the sake of our children and theirs?"

Mr. Peter Mok, Head of Strategic Partnership, Hong Kong Science and Technology Parks Corporation,
shared his view on talent. He pointed out that because talent is "at the heart of our world, they will shape our future. With rapid growth of information, technologies change quickly and infuse classrooms, the society, and the world".

Mr. Mok shared that Hong Kong's standing in the world is beyond being a leading international financial hub; it's also a globally competitive and innovative city — 3rd in the Asia Pacific region and 13th globally in the Global Innovation Index 2019. Blessed with such a formidable position in the world, he questioned how Hong Kong should boost its innovative capacity further and open the doors to a new world of possibilities and opportunities. The relevance of education should be centred around equipping future talents to embrace those opportunities. He concluded that technology is just a tool and called upon empowering future talents with the value of innovation, creativity, teamwork, ethics, and responsibility.

Chapter 2
Forum discussions

Summary of Panel A Discussion

Panel A discussed two questions:

1

In view of Industry 4.0, UN's 17 SDGs as well as the COVID-19 experience,
what opportunities are afforded for our existing education to be fit for purpose?

2

If AI can do what most humans can do in traditional jobs,
what different roles do you see teachers performing in the future?

Dr. Maggie Koong shared the experiences of one of the schools she supervised in their journey towards digital transformation. This school of 1800 students transitioned from "digital citizenship" to "digital leadership". She pointed out that educators should facilitate students in taking an active part in the digital world and find ways to let others hear their voices. She supported "digital citizenship" education that nurtures students to be accountable, respectful and responsible, as well as the development of "digital leadership" in young people.

To achieve this, educators need to provide a platform where young people can express themselves, supported by qualified mentors. The adult mentors would advise the "digital citizens" on the posts that they would like to put up on social media. She also cited the usefulness of online learning during COVID-19 pandemic when physical classes were suspended. Teachers from her school used online platform and digital media to liaise with students and support their learning online. Students could seek help online from different parties and individuals as well as reflect on their learning. They could also access advice and information quickly. Parents could also understand more about their children's learning styles and progress when they learned at home. Students were found to be willing to interact with their teachers and mentors online. They would share what they learned and raise questions which they have.

Dr. Koong pointed out that while educators could outsource some responsibilities such as knowledge transfer and skills transfer, the importance of human interaction is one thing that could never be outsourced. Teachers should be competent in how they present their materials, how to organise learning spaces, and how to support students intellectually and emotionally when interacting with each other. Dr. Koong thought that AI could not substitute teachers, but the teachers' way of teaching should be changed. Teachers should be open to embrace technological changes and be ready to utilise technologies in teaching and learning.

The second panellist, Mr. Victor Kwok, pointed out that technology had created many jobs in the past two decades, for instance in the social media market. More jobs have been created by technology than being erased by it, and some have become mainstream. How can people benefit from this technological trend and take advantage of the opportunities ahead? First, students need to be equipped with the relevant skills and knowledge and connect them with the workplace. Secondly, the workforce needs to upskilled and reskilled because the demands could hardly be fulfilled by schools alone. Education also needs to broaden and be more inclusive to consider even housewives and retirees.

According to Mr. Kwok, Hong Kong's education system is more academic and exam oriented. Only 12% of the students are enrolled in the applied and vocational programmes. This is much lower than the 42% in OECD countries. Although Hong Kong students perform better in the science subjects as compared with other countries and territories, the critical issue now is how to nurture future generations in these areas. Approaches adopted in other countries include direct inputs from the industries in school curricula. Teachers could also devote more time to equip themselves with technological skills. In South Korea, students spend less time in class and assessment but are given more opportunities to explore their career options under their teachers' guidance. A program in the UK places teachers in universities and industries, exposing them to the latest developments and bringing them back to their schools.

Continuing education in Hong Kong is underdeveloped, having a participation rate of around 20%. Mr. Kwok pointed out that it is a matter of "breaking boundaries" of place, time and age of schooling. The concept of micro-credentials is less about structured periods of learning but is competency and credit based. This enables learners to obtain the qualifications upon completion of the programmes whether it takes one or two years or even ten years. In conclusion, Mr. Kwok emphasised the importance of "inclusive future" in education" — inclusiveness of talents, age, demographics etc. The government, industries and industries all have a part to play.

The third speaker, Professor Simon Shen, spoke on education in an era of technology advancement and the new world order for global citizens. With things like AI and machinery dominating our lives, why would students still need to attend physical classes on campus? People should consider what kinds of jobs are irreplaceable. He believed that language abilities, diversity of knowledge and knowing how to utilise machines are crucially important. The skillsets for the future revolve around presenting and communicating — communicating with machines, humans, the world, masses, both top/new elites and traditional elites. He cited his personal experience of looking for someone to take care of his baby. Caregiving could not be replaced by machines. As the ability to interact with different kinds of people is a critical skill, experiential learning should be encouraged in different types of settings.

Professor Shen also pointed out that extracurricular activities were strongly encouraged in the past, but hands-on experiences at workplaces are now being encouraged. For example, experiences in a start-up company could enhance the portfolio of students. Additionally, "cultural intelligence" (CQ) is replacing earlier emphases on IQ and EQ in training programs. CQ refers to the extent a person is able to cope with different cultures and communicate with different people. It is expected that cross-cultural knowledge and the ability to interact with people from different cultures would become an education trend in the future. In fact, locals are able to interact with people from diverse cultural backgrounds in Hong Kong these days. People should get used to the new world order and become equipped with better communication skills.

Summary of Panel B Discussion

This session involved four panellists who focused on how schools could do more and better when they are serviced by a new generation of connected and innovative people; and how AI, digital analytics and other new practices could reduce or remove the negative impact of high-stakes summative assessment.

Mr. Spencer Leung started the panel noting that we are now living in a "brave new world". An example is the capability of launching rockets into space and to recover them from precise locations. Even with AI and advanced technologies playing increasingly important role in our daily lives, the degree of technological advancement should not be a barrier in education; rather it's the lack of imagination. Educators should enable students to generate original ideas with their skills and knowledge, not repeating the things done before. Citing Musk's dream about going to Mars, education should encourage students to "dream".

Learning should not be predetermined at an early stage, nor have students placed in separate groups based on their abilities. Instead education should be inclusive, and learning should not stop after formal schooling. With the convenience and availability of Internet and technology, it is easier for people to learn continuously.

Mr. Leung also shared his views on the future of education from a macro point of view. Education should emphasise fundamentals such as "who we are", the larger purposes of life, and how to be a better human being. Compassion is needed as people become more and more disconnected in a digital world. Also, issues such as world peace, conflict resolution and climate change cannot be taught by AI. Educators with passion are needed to move education forward in the future.

The second panellist, Mr. Tommie Lo, spoke on "reimagining education". He pointed out that Education 1.0 has existed since the time of the Industrial Revolution without much change until today. This classroom model comes with a "standardised" curriculum, taught by a teacher to 40 students. Such a "one-to-many" approach continues to exist even in fancily-designed schools that use technology.

Even though schools may have adopted new kinds of gadgets such as tablets and smartphones, the knowledge transferred has remained largely the same over the past decades. Education today needs a paradigm shift from "standardisation" to "personalisation". Also, the cumulative learning experiences of each cohort of learners should be passed on to the next. Mr. Lo asserted that real changes are not created by platforms such as MOOC, which continues the "one-to-many" approach, nor by simply increasing government resources, or simply promoting STEM education.

AI can help to transform traditional norms by providing more options for education. Mr. Lo posed the question whether classrooms could be decentralised. For example, teaching sessions could be held in London and New York for one semester, then in Hong Kong for another semester. Professionals and experts from the industries could be appointed as "teachers" in a many-to-many approach. Generally speaking, the education sector should be more flexible in providing different types of teaching methods to suit individual students, as well as providing customised and tailor-made learning materials. Mr. Lo advocated a one-to-one education system that is balanced and scalable; one that promotes spontaneity and deep learning. To sum up, Mr. Lo stressed the need for a "climate change in education". Future education should provide the right kind of conditions to nurture the learning growth of different types of students. Learners should not be confined to a "green house" environment but enabled to grow like in a forest. Future education should be connected to real-life people and problems, and based on "ecosystem control" rather than "strict control".

The third panellist, Mr. Dennis Shi, highlighted that learning from professionals and people from different cultural backgrounds would enable students to learn things that they could not learn by themselves. His company had facilitated communication and interactions with different firms in the technology sectors in Hong Kong and abroad. Such "live experience" comprising remote and flexible learning, and the sharing and interacting with different people in different settings should be promoted. While technology can enable the provision of digital learning and workshops, the key is not content but to learn from individuals who have experiences in their respective fields. Learning that utilises a range of online platforms can be continuous, flexible, on demand, and personalised.

Mr. Shi believed that schools should be nurturing students' attitudes, mind-set and values about life. Schools can provide the environment for students to collaborate and discuss with other people, more than the "feeding" of content and knowledge to students. He noted that AI could not entirely "replace humanity", at least in the near future. He advocated the value of curiosity, creativity, and passion in the face of failure. He also highlighted the importance of asking "why" especially for relevant problems somehow unaddressed, then seeking solutions to these by learning from multi stakeholders.

Mr. Arnett Edward, the final panellist, spoke on the utilisation of AI and high technology in education. As a school principal, he believed in the vision of education contributing to peace and sustainability; these should be the major foci of the future of education. His school encourages students to learn from their experiences of living together. Mr. Edward thought that diversity is the key to generating innovation.

By interacting with people from different cultural backgrounds, we could benefit from being exposed to different knowledge and ideas.

Mr. Edward could see the range of opportunities for educators, especially in moving away from high-stakes examinations. He thought AI and big data are "allies" for digital portfolios. In terms of the examinations of the future, we need to rethink what knowledge is really needed. How to link the vast amount of knowledge available in the worldwide web to skills? Citing the disruptive situation caused by the COVID-19 pandemic, he advised education to embrace disruption and adopt new approaches such like blended learning.

With regard to getting graduates prepared for multi-tracked careers, Mr. Edward thought that it is a matter of mindset. He advised young people to "slow down" and enjoy education. As "life is not a race", they should be mindful that they would face different career changes and opportunities. The issue is how to manage these "transitions" in their lifetime and how to be resilient with coping strategies for the different stages.

Full recordings of the Futures of Education Forum can be viewed here:

bit.ly/eduForum_video

Summary of pre-forum survey

The pre-forum survey was conducted to find out how stakeholders in Hong Kong think about the Education of today and of the future. In particular, how the stakeholders see the various technological advancement under "Industry 4.0", including the Internet of Things (IoT) and AI might change the landscape of education.

The survey, in the form of an online questionnaire, was distributed through existing networks of stakeholders between April and May 2020. The total number of respondents was 542, in which 60% of them were female and 40% were male. Over 60% of respondents were aged between 16 and 45, and 29% were aged between 46 and 60. Just over 30% of them reported to have no direct involvement in education while 18% were parents and 13% were students. The other groups of respondents were service providers (15%) and practitioners (11.5%).

First, the respondents were asked to indicate the extent to which they agreed with the importance of each challenge to humanity (1= strongly disagree; 5=strongly agree) (Table 1). The most agreed upon issue was climate change (4.51), followed by environmental crisis (4.38) and population ageing (4.13). These items were categorized into three major dimensions. The most agreed dimension was "environmental issues" (3.92); and they were least agreed with issues related to the "macro environment" (3.67) as the greatest challenge in 2050. The mean score for the dimension of "concerns about daily living" was 3.92.

	Mean	Standard Deviation
Climate change	**4.51**	0.833
Migration/mobility	3.40	0.913
Environmental crises	**4.38**	0.815
Political extremism	4.12	0.930
Economic inequalities	3.93	0.879
Poverty	3.77	0.918
Violence	3.68	0.988
Armed conflict/war	3.60	1.065
Injustice	3.56	0.981
Population growth	3.56	1.01
Population ageing	**4.13**	0.899
Technological change	3.92	1.021
Employment and work	3.64	0.970
Family relationships	3.47	1.007

Table 1   What do you think will be humanity's greatest challenges in 2050?

	Mean	Standard Deviation
Active Citizenship	4.05	0.947
Continuous learning	**4.28**	0.851
Democracy	3.90	1.070
Economic Growth	3.65	0.852
Gender Equality	3.92	0.950
Health and Well-being	**4.29**	0.788
Human Rights	4.11	0.935
Social justice	4.20	0.903
Individual Freedom	3.98	1.006
Linguistic ability	3.88	1.006
Peace	**4.33**	0.886
Resilience	4.24	0.870
Scientific Innovation	4.25	0.818
Skills for Work	3.96	0.890
Social Cohesion	4.11	0.828
Spirituality or Religious Belief	3.48	1.094
Personal sustainability	4.12	0.879

Table 2   What should be the purposes of education worldwide in 2050?

The respondents were also asked to indicate their views on the purposes of education worldwide in 2050 (Table 2). The issues receiving the highest concern were world peace (4.33), followed by health and wellbeing (4.29) and continuous learning (4.28). These were categorised into two broader dimensions: "social wellbeing" (4.04) and "justice" (4.05).

The respondents also indicated their opinions concerning the purposes of education in 2050 for tackling the social issues in Hong Kong (Table 3). The most agreed issue was social cohesion and atmosphere (4.25), followed by relationship with the world (4.24) and environmental protection (4.2). The dimension with the highest mean score was "economic and social wellbeing" (4.08), and "issues of family and personal wellbeing" had the lowest mean score (3.71). The importance of "ideological values" in education received a score of 3.99.

	Mean	Standard Deviation
Poverty and wealth disparity	3.90	0.969
Population ageing	3.88	0.992
Environmental protection	**4.20**	0.917
Urban environment	3.92	0.895
Economic restructuring	3.99	0.883
Relationship with Mainland	3.93	1.112
Relationship with the world	**4.24**	0.851
Housing	4.05	0.934
Healthcare	4.15	0.897
Constitutional development	4.01	0.951
Legal system	4.13	0.959
Family relationships	3.93	0.927
Family caregiving	3.81	0.939
Childcare	3.74	0.943
Scientific Innovation	4.16	0.889
Sustainable employment	4.17	0.879
Social Cohesion and atmosphere	**4.25**	0.860

Table 3   What should be the purposes of education in 2050 for tackling the social issues in Hong Kong?

	Mean	Standard Deviation
Assessment Methods	4.01	0.871
Teaching and Learning	**4.32**	0.845
Knowledge Production	**4.12**	0.838
Curriculum Development	4.09	0.867
Supporting Special Needs of Students	4.03	0.870
Relationship among Teachers and Students	3.79	0.943
School-family and teachers-parents collaborations	3.82	0.961
Connection to External Learning Resources	**4.20**	0.870

Table 4   Which aspects of education system will be most affected by Industry 4.0?

In terms of which aspects of the education system would be most affected by Industry 4.0 (Table 4), teaching and learning (mean=4.32) received the highest rating, followed by connection to external learning resources (4.20) and knowledge production (4.12). Generally speaking, the respondents thought that issues related to "general education development" (4.17) would be more affected by Industry 4.0 than the "interpersonal" dimensions (3.92).

Regarding the competencies that could enable students to thrive most in the future (Table 5), flexibility and responsiveness (4.45) received the highest score, followed by creativity and innovation (4.4), collaboration (4.39) and critical thinking (4.37).

Generally speaking, the respondents thought that students' competencies in their "personal virtues" (4.51) were more important than their "social skills" (4.22) in becoming successful under Industry 4.0.

The respondents were also asked to write on what they see to be the major and key issues for the future of education in less than 200 words. Their opinions are categorised into three major themes: 1) personal development and character; 2) social and political environment; and 3) economic factors and technological development.

In regard to personal development and character, the major opinions were helping students to find personal purposes for life, enhance their imagination, creativity, critical thinking skills and digital knowledge. Moreover, there is a need to enhance their cultural confidence when facing the upcoming social and economic trends, with chances for them to utilize their potentials and adaptability skills. Also, in terms of personal virtues, students need to develop mutual respect to others and a sense of contribution to the society and conflict resolutions through moral education. Education should also address the necessity of pro-humanity education under the age of neoliberalism or post-neoliberalism, and to nurture a vision amongst students with reality and skills and drive required for transformation. Besides, truths, emphases of facts and self-directed learning are also considered to be important.

In regard to social and political environment, the major problems in the eyes of the respondents were: protection of democracy and human rights, academic freedom and responses to political issues. A number of respondents opined that education should be detached from political factors, such as free of intervention by any political force. History curriculums should be strictly based on facts and evidence. Some thought that whether education is relevant to the changing world and the understanding of global inter- connectivity, as well as Hong Kong's long-term relationship with Mainland China. Other concerns were the ability of the education system in aligning with learners' needs, and the resources available for sustainable development.

As for the impact of economic factors and technological development, respondents were most concerned about the ability of education to facilitate upward mobility of the younger generations. The challenges brought by technological development and knowledge development were also major concerns. For example, the use of AI could have negative impact on educators and the entire education system. Respondents felt the need for more cross-disciplinary and creative learning contents to boost the innovation potential of students. Others thought that over reliance on technology could result in the lack of human touch and interpersonal relationships. Other key opinions include worries about the lack of innovative mind-set and technological skills amongst the teachers, inconsistencies between training contents and the reality of labour market, lack of international perspectives, and authenticity of knowledge to be conveyed to students. Also, as technology advances, student-teacher relationships could be adversely affected. Students' excessive focus on learning on the Internet could be risky. Education should not neglect the importance of character development of the younger generations and their engagement with the community.

The next question focused on respondents' vision of education in 2050. Submitted opinions were divided into three major categories: 1) social and political aspects; 2) diversity and multidisciplinary; and 3) economic development and competence in the technological age. The major visions in the social and political aspects were the role of education to resolve social issues and establish equal opportunities in the society. Students should be nurtured to be "healthy" and global citizens, able to adapt and be flexible in a dynamic and changing world. Student should also be educated about human rights, justice and equality. They should also be more aware of China and issues related to developing countries. National education and Chinese history curriculum should be enhanced, so that students could appreciate the Mainland's rapid development over the past few decades. With regard to the education profession, it should receive respect and be free from political pressure, so that students could be nurtured as critical and independent thinkers.

	Mean	Standard Deviation
Critical Thinking	**4.37**	0.905
Collaboration	**4.39**	0.841
Multi-tasking	4.12	0.963
Cross-disciplinary ability	4.25	0.839
Flexibility and responsiveness	**4.45**	0.814
Lifelong learning	4.26	0.892
Connectivity	4.14	0.851
Creativity and innovation	**4.40**	0.800
Digital abilities	4.28	0.791
Inter-personal skills	4.21	0.992
Communication skills	4.24	0.967
Compassion to other people	4.11	1.036
Resilience	4.24	0.957

Table 5   In light of Industry 4.0, to what extent do you agree with these competencies can enable students to thrive most in the future world?

With regard to diversity and multidisciplinary, respondents thought that students should be exposed to a diverse range of contents and teaching methods. Also, education should focus on hands-on skills, practicality and "interestingness". Also, students should not be excluded from educational opportunities and advancements because of their difficulties. In terms of visions in economic development and competence in the technological age, most respondents pointed out that learning environments and operation of educational activities should be AI-assisted—to stimulate learners' thinking and problem-solving skills. With the blending of education and technology, students' views on global issues should be broadened. The use of technology for running online classes could benefit students living in remote areas, and as such technology could enhance people's well-being.

With regards to the visions of fulfilling personal needs and facilitating self-development, the major aspects pointed out by respondents mostly emphasise on the relationship between personal development and the social needs, the nurturance of critical thinking, problem- solving and other soft skills. Future generations should be trained to be adaptable to changes in the society and economy, and academic performance should no longer be deemed as the sole objective of personal growth. They should not be given definite answers and standard ways to do things; instead, they should be encouraged to explore possibilities and be independent learners. Students should also cultivate a sense of responsibility towards society and be more caring of others. The values of love and care should be upheld by the younger generations, who should also be encouraged to see things from global perspectives. Global citizenship should also be promoted.

Additionally, the development of students' virtues such as resiliency, positive thinking, assertiveness, peaceful relations, and willingness to collaborate with others should also be integral aspects of education in the future. Experiential learning and service learning should also be integrated into the different curricula. The provision of joyful, flexible and relaxing learning environments would greatly benefit the younger generations in terms of their knowledge and character development.

Survey Results:
Futures of Education

Conducted by UNESCO Hong Kong Association Glocal Peace Centre (GPC), the Futures of Education Survey was a local response to the UNESCO "Futures of Education" initiative.*

The Survey formed the basis for deliberation at GPC's first "Futures of Education Forum" in Hong Kong on 20 June 2020.

**Conducted
Apr - May 2020**

**542
responses**

**Online questionnaire
was distributed to schools, institutions,
community organisations**

**Questions on
Education in 2050 and industry 4.0**

*UNESCO's Futures of Education initiative aims to rethink education and shape the future. The initiative is catalyzing a global debate on how knowledge, education and learning need to be reimagined in a world of increasing complexity, uncertainty, and precarity. (https://en.unesco.org/futuresofeducation/)
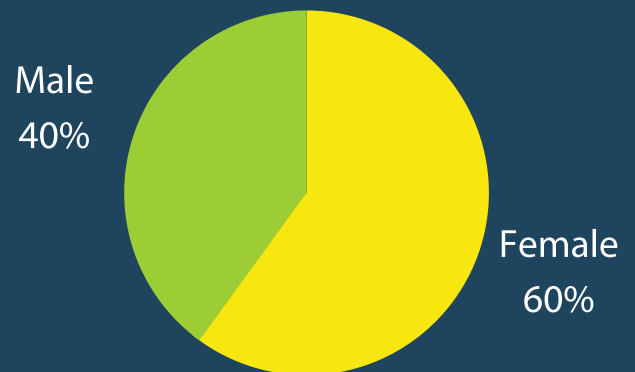
Futures of Education Survey
Demographics

68% of respondents were involved in education in some respect, with around 10% working in roles that could influence policy.*

Age

> 60
7%

16-30
32%

46-60
29%

31-45
32%

Gender

Male
40%

Female
60%
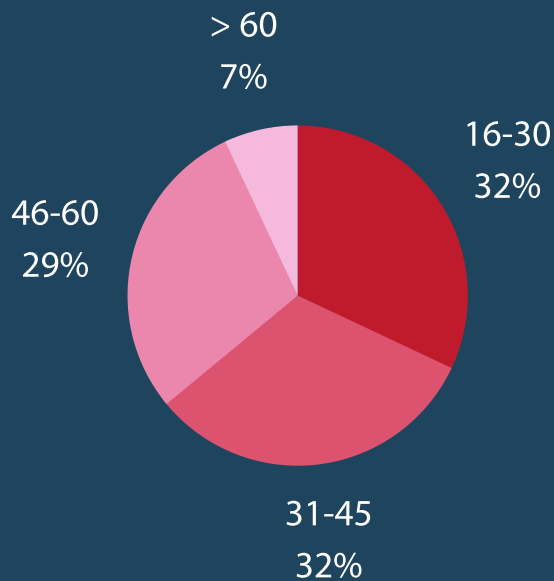
30% were students and parents

27% were working as education professionals.

Survey Results

Method

Respondents were asked to indicate how much they agreed with a range of options on a scale of 1 to 5. Only the five highest scored options are shown.

1   2   3   4   5

Strongly disagree

Strongly agree

Each option was categorised into a theme/dimension. A score for each theme/dimension was generated by taking the mean score of the options included in the dimension.

Humanity's greatest challenges in 2050 *

Challenge	Score
Climate change	4.51
Environmental crises	4.38
Population ageing	4.13
Political extremism	4.12
Economic inequalities	3.93

3.5   3.7   3.9   4.1   4.3   4.5

Average scores

Environmental issues** (e.g. climate change, environmental crises) were seen as the most urgent, followed by concerns about daily living (e.g. population aging).
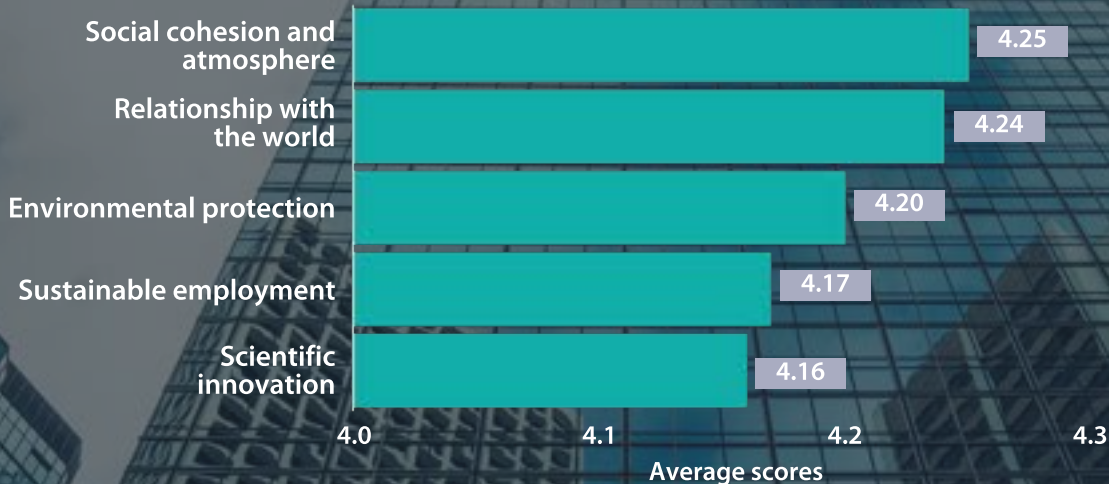
Survey Results

Most important purposes of education in 2050

Peace	4.33
Health and well-being	4.29
Continuous learning	4.28
Scientific innovation	4.25
Resilience	4.24

Average scores
(4.0, 4.1, 4.2, 4.3, 4.4)

The mean scores for the dimension of justice (e.g. peace) and social well-being (e.g. health and well-being) were very similar, showing that respondents valued both dimensions equally.
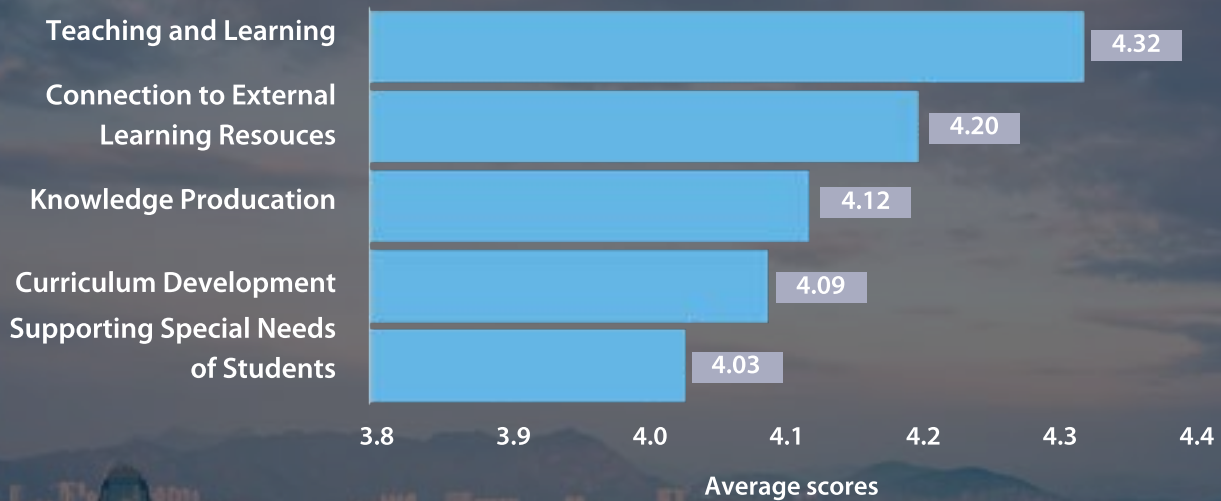
Most important purposes of education in 2050 for tackling the social issues in Hong Kong

Social cohesion and atmosphere	4.25
Relationship with the world	4.24
Environmental protection	4.20
Sustainable employment	4.17
Scientific innovation	4.16

Average scores
(4.0, 4.1, 4.2, 4.3)

Economic and social well-being (social cohesion and atmosphere, relationship with the world, sustainable employment) was seen as the most important purpose of education, as was fostering ideological values (environmental protection).
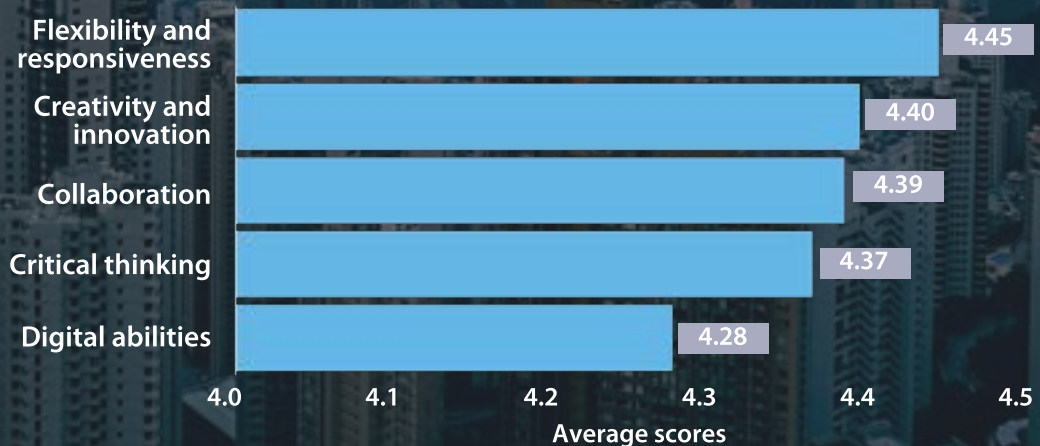
Survey Results

Most affected aspects of the education system by Industry 4.0

Aspect	Score
Teaching and Learning	4.32
Connection to External Learning Resouces	4.20
Knowledge Producation	4.12
Curriculum Development	4.09
Supporting Special Needs of Students	4.03

Average scores: 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4

Issues relating to general education development (e.g. teaching and learning, connection to external resources, etc.) were seen as more likely to be affected by Industry 4.0 compared to interpersonal dimensions (e.g. supporting special needs).

Competencies which enable students to thrive most in the future in light of Industry 4.0

Competency	Score
Flexibility and responsiveness	4.45
Creativity and innovation	4.40
Collaboration	4.39
Critical thinking	4.37
Digital abilities	4.28

Average scores: 4.0, 4.1, 4.2, 4.3, 4.4, 4.5

Personal virtues (e.g. flexibility and responsiveness, creativity and innovation) were seen as better able to help students thrive in Industry 4.0 compared to social skills (e.g. collaboration).

Main Goals of Education by 2050*

Personal development and character

- Find purpose in life
- Less standardisation - to develop creativity and critical thinking
- Feel a sense of contribution to society

Economic factors and technological development

- Increase upward mobility
- Integration of AI in education
- Cross-disciplinary and creative learning contents
- Reliance on technology
- Creativity and digital literacy amongst the teachers

Social and political environment

- Free from political pressures
- Equal access to education opportunities and advancements
- Use education to solve social issues (human rights, justice, equality)
- Enhanced national education and Chinese history curriculum
- Diverse environment to nurture global perspectives (cultural intelligence)
- Sense of responsibility for society and others

*Respondents gave their own opinions in a free-response format. Answers were summarised into three main categories.

Conclusion and way forward

The challenges of Industry 4.0 and the COVID-19 experience have impressed upon the world the critical importance of sustainability and being responsive to unpredictability. In education, we are realising the importance of capitalising on human uniqueness; developing not only knowledge and skills, but also attitudes and values that can guide people towards ethical and responsible actions. We are also looking at "new normals" such as digital leadership, transformative competencies, creative and collaborative individuality, technology-enhanced lifestyles and well-being, and sustainable educational eco-systems.

Let us work together for creating education futures that enable our children and citizens to adapt, thrive in, and even shape whatever the future holds.

References

UNESCO 2020, UNESCO Futures of Education
https://en.unesco.org/futuresofeducation/

UNESCO Futures of Education: Learning to Become (Video)
https://youtu.be/7865y7hbehY