Individuality, Accessibility, and Inclusivity: Applied Education and Lifelong Learning in Revolutionising Education for the 21st Century

Contribution to the Futures of Education Initiative

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This report was prepared by the Education and Youth team of Our Hong Kong Foundation for the express purpose of submission to the UNESCO International Commission on the Futures of Education. The report reflects the findings from around 80 stakeholder interviews conducted in the past 2 years, as well as numerous conferences and forums that the team participated in, including the Futures of Education for Industry 4.0 and Beyond Forum by UNESCO Hong Kong Association Global Peace Centre in June 2020.

1. Prospects for education in the modern age

To preface with a thought that few will find controversial: education, both as an abstract concept and in practice, can no longer stand as it has existed for the past few centuries. The burgeoning prospect of Industry 4.0, slowly coming into reality, brings with it challenges and opportunities for education and learners' career prospects. Technology has penetrated and blurred national borders, enabled increasing migration both physically and digitally, and threatens to fundamentally change the landscape of labour markets; an estimated 75 million jobs are under threat of replacement by 2022, while 133 million new jobs in unprecedented fields will be created[1]. Simultaneously, societies have begun to age more rapidly, accelerating mature educational needs as workers stay on longer before retiring and must confront greater changes in the workplace. This is a critical time for a much-needed worldwide revolution in education.

Education, learning, and knowledge all need to undergo significant reimagination in a world that is constantly evolving towards Industry 4.0; at the very least, traditional curricula, academic qualifications, and learning settings will need to be redesigned, along with stronger partnerships between schools and industries to induce further collaboration between educators and businesses, and thereby update curricula to reflect contemporary trends in private sectors. Technology industries worldwide also need more dynamic talent in the applied sciences to meet their ambitions, necessitating more forward-looking and versatile education of young graduates looking to enter these fields.

The COVID-19 pandemic has revealed some of the flaws of education in its current state, and magnified other shortcomings, albeit while also propelling students, educators, and institutions all over the world to innovate and adapt to new frameworks and methodologies for learning and teaching. An OECD survey revealed that educators worldwide found it most challenging to make available technological infrastructure for teaching, address students' emotional health, and achieve the right balance between digital and screen-free activities. It also exhibited that educators have made use of this crisis to introduce technologies and other innovative solutions into teaching, allow students to gain more autonomy in

[1] Centre for the New Economy and Society, *The Future of Jobs Report*, (Geneva: World Economic Forum, 2018), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf

managing their own learning, and increase societal interest in education.[2] These double-edged contributions of the ongoing pandemic towards the field of education globally have created an opportunity to be seized, if students, educators, and societies at large are to stay ahead of global trends and initiate a paradigm shift in education.

2. Applied Education and Lifelong Learning: the answers we need

This report focuses on applied education and lifelong learning as primary vehicles for shaping the future of education to adapt to the upcoming challenges between now and 2050. They offer two different but complementary directions for consideration that could redefine the conventional boundaries of education and pioneer a more inclusive and practical form of education: integrating and broadening socially-relevant study options into current learning for students, and enabling reskilling and upskilling for the modern workforce.

What is applied education, and how does it differ from vocational education? Applied education is an innovative concept: it is an interdisciplinary mode of education that merges learning and practice, emphasises cultivation of practical skills, focuses on school-industry collaboration, and inspires students to explore future career opportunities through learning. Applied education diverges from traditional academic research-based education in that it prioritises the delivery of vocational competencies to students, and stresses aspects of hands-on technical learning through real life experiences where constructive, allowing students to receive a more holistic and flexible educational experience that truly serves their needs and goals in life. This concept also revolves around catering to a diversity of learners and celebrating their individual talents with multiple pathways in education and later life, preparing them for a constantly evolutionary job market as technological innovations transform the landscapes of different industries across the board.

Lifelong learning is crucial to the sustained education and development of people of all ages, particularly those of working age and above without access to formal education, and plays a significant role in fostering a culture of ceaseless, interconnected learning in society for the benefit of all. It is a "learner-centric, demand-led approach to education that enables learners of all ages and backgrounds to codesign actively and use any learning process and its outcomes to achieve their full potential."[3] It entails transforming educational institutions and reconfiguring learning opportunities and venues, and ensuring that the recognition and accreditation of various learning outcomes earned from different credentials are standardised and validated. Key to this concept is that learning be made available for everyone, at any time, anywhere, and about everything, which can now be made possible by advancements in internet and technology. As such, it is of the essence to leverage innovative technologies in the interests of all learners, including those socially and economically disadvantaged.[4]

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[2] Fernando M. Reimers and Andreas Schleicher, "A framework to guide an education response to the COVID-19 Pandemic of 2020", *OECD*, (2020), 17-18. https://globaled.gse.harvard.edu/files/geii/files/framework_guide_v1_002.pdf

[3] UNESCO, *Embracing a culture of lifelong learning: contribution to the Futures of Education initiative*, (Hamburg: UNESCO Institute for Lifelong Learning, 2020), https://unesdoc.unesco.org/ark:/48223/pf0000374112

[4] Ibid

3. Education must evolve and adjust to global trends before 2050

Education in its current form is too rigidly structured and standardised to allow for flexible teaching beyond ordinary pedagogical methods of classroom learning and one-size-fits-all rote recall, never mind preparing students to deal with digitalisation of various industries and applying their learned knowledge and competencies. The COVID-19 pandemic has almost forcibly introduced online learning to schools all over the world, but digitising learning itself is not sufficient; student participation and interaction, whether online or offline, must be increased to allow them to absorb and use the information they have learned. Moreover, secondary and tertiary education around the world is still mainly academic-oriented, focusing too much on textbook knowledge and information regurgitation while neglecting hands-on experiential learning and technical-vocational training; the OECD average of 15-24 year olds participating in vocational education across secondary and post-secondary educational levels stands at a meagre 18%[5]. The majority of attention in the field of education is also placed on children and youths, neglecting adults who are similarly in need of lifelong learning, particularly those in the workforce who require learning more of applied education than any other varieties.

Our education systems focus too little on human development or skills acquisition, preferring instead the traditional path of knowledge transmission as the primary method and objective of learning. This is the result of standardisation of education across different schools and regions, as various jurisdictions stipulate education-related aims and outcomes in policies that educators must execute, which are often assessed via standardised testing. Knowledge transmission is easily the most universal aspect of education, given that sets of basic information which all students must learn underpin nearly all educational systems around the world. More complicated and unavoidably individualised are human development or skills acquisition, which need to be tailored—by various degrees—to each and every student's personality, culture, values, interests, and aspirations.

4. Case studies for applied education and lifelong learning

Universities of Applied Sciences (UASs) are excellent models for applied education at ISCED 2011 levels 6 to 7, rather than the more common vocational training programmes at ISCED 2011 levels 3 to 5. As practically-oriented, tertiary degree-offering institutions, UASs focus on the practical implementations of scientific techniques and provide both professional accreditations and degree qualifications—some up to postgraduate levels—to prepare graduates for future employment via industry participation and experiential elements in curricula. Their focus on hands-on learning offers students the opportunity to explore different practical skillsets through work-based training, and provides an alternative pathway to higher education for upper secondary vocational students that may lead to higher earnings premiums and better career paths in the long run. A major advantage in establishing applied education at degree levels is the strong emphasis on tertiary education in labour markets nowadays, and the additional value that higher education holds in the face of today's volatile job markets and the threat of career obsolescence from rapid technological advances heralding digitalisation and automation of many manual jobs.

[5] OECD, *Education at a Glance 2020: OECD Indicators*, (Paris: OECD Publishing, 2020), 35 https://www.oecd-ilibrary.org/education/education-at-a-glance-2020_69096873-en

ISCED-Programmes (ISCED-P)	
0	Early childhood education
1	Primary education
2	Lower secondary education
3	Upper secondary education
4	Post-secondary non-tertiary education
5	Short-cycle tertiary education
6	Bachelor's or equivalent level
7	Master's or equivalent level
8	Doctoral or equivalent level
9	Not elsewhere classified

Figure 1: ISCED 2011 programme classifications[6]

The Volkswagen dual work-study degree programmes, partnered with a number of UASs in Germany, exemplify possible avenues for applied education at ISCED 2011 level 6, as they combine academic study with practical job training to result in an integrated undergraduate degree with an industry-led curriculum. These work-study degrees offer a professional certificate along with an undergraduate degree within a study period of 3.5 to 4.5 years, alongside EUR €1,134.50 in remuneration per month and a job offer at Volkswagen upon successful completion. During the course of the programme, students will alternate between studying relevant classes at their respective universities in various applied sciences subjects, such as electrical engineering or vehicle construction, and participating in either vocational training in their specialised paths or in practical study blocks in training workshops at Volkswagen sites around the country. Programmes that are offered as integrated vocational training usually culminate in a final Chamber of Industry and Commerce (IHK) examination for full completion, thereby bestowing a professional qualification upon students to advance their career prospects.

This successful amalgamation of academic and vocational learning within one programme is emblematic of the potential that applied education can reach when placed in both tertiary institutions and businesses, allowing students to choose educational pathways that suit their strengths even at tertiary and quaternary level. Applied education delivered in such a format also allows students to develop a deeper understanding of interdisciplinary processes in business and production, and to cultivate their own personal network across academic and industry contexts. It also provides professional experience involving practical application of theoretical knowledge learned beyond short internships or placements during school breaks, supplemented with company guidance and support under a structured corporate framework and work environment.

A relatively successful model of lifelong learning that has been implemented on a national scale is the SkillsFuture programme in Singapore, an initiative that provides a line-up of career-related educational and supportive resources to citizens of all ages depending on their needs and interests. Its robust framework comprising skills and training courses, life and career guidance, study awards, industry placements, and subsidies is supported by the government, educational institutions and platforms, and industry partners. Its usage is spread out fairly evenly across all age groups, a rare feat to achieve for a career-oriented lifelong learning initiative, especially amongst the young and the elderly: 16% of users number amongst the 25-29 age group, while 23% of users are above 60. A revolutionary part of

[6] UNESCO, *International Standard Classification of Education (ISCED) 2011*, (Quebec: UNESCO Institute for Statistics, 2012), http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

SkillsFuture is the inclusion of massive online open courses (MOOCs) in the approved courses open to study, furthering accessibility and inclusivity in continuing education, as MOOCs are less structured, easier to attend, and do not have a set timeframe for completion.

Of particular note is the SkillsFuture Credit programme, the main highlight of Singapore's numerous lifelong learning incentives. This programme provides established funding to adult working citizens from their early career onwards to attend various courses of their own choice that teach different skills and competencies for use in the workplace, so that they can take ownership of their own skills development and make their own decisions with regards to their learning. All Singaporeans aged 25 or above received SGD $500 in credit towards a wide range of eligible courses in 2015, which is available to them for life. They are slated to receive a further $500 in credit towards all eligible courses, which is designated to expire in 2025 and thereby instil urgency in citizens and encourage them to use the subsidies for classes sooner rather than later.

SkillsFuture Credit also addresses the need to reskill or upskill Singapore's aging workforce by providing further incentives to older workers participating in different courses. 40-60 year old citizens will receive an additional $500 in credit for courses in eligible skills and career pathways programmes. For workers aged 35 or older earning less than $2000 a month, 95% of their course fees are subsidised by Workfare Training Support; citizens aged 40 or above will receive subsidies up to 90% of course fees for SSG-supported courses, and at least 90% of course fees for certain MOE-subsidised courses.

SkillsFuture further contributes to lifelong learning for its citizens by supporting employers and training providers in modernising Singapore's workforce. P-Max is a programme that helps SMEs recruit, train, manage and retain newly hired professionals, managers, executives and technicians (PMET), while placing candidates into PMET positions with SMEs and helping them acclimatise to the work environments. iN.LEARN 2020 is another new initiative that introduces blended learning—online and offline learning—in Continuing Education and Training (CET) to meet the needs of firms and individuals in the workplace. This initiative fosters collaboration among CET practitioners, such as training providers, adult educators, enterprises, consultants and technology vendors to enhance the quality, accessibility, and effectiveness of learning.

5. Avenues to explore for an all-rounded global educational ecosystem

Pursuing applied education and lifelong learning in this day and age bring several critical advantages to the table for learners on an international level: the personalisation of education to suit the learner's own needs and wishes, the provision of diverse pathways for learners to pursue in formal and informal education, and the future-proofing of education to ensure that everyone can adapt to shifting breakthroughs and practices brought on by technological and social advancements. These two avenues create a more well-rounded and inclusive profile for education that can become more accessible to all and could be paramount towards truly fostering learning societies that prize knowledge and education as goals in and of themselves, and also towards building equally esteemed career paths.

Applied education empowers students to deviate from the more socially privileged pathways of general and academic education throughout secondary and tertiary levels and follow their interests in more practical education if they so desire. Its focus on creative interaction and hands-on participation, along

with their higher levels of industry involvement in instruction and curricula, bestow more flexibility and ability to respond to current social and professional needs, while allowing students to choose to enter either the labour market or further education following graduation. In particular, the proliferation of UASs offering applied undergraduate and postgraduate degrees would contribute much towards legitimising applied education as a viable alternative towards an equally successful career path, removing the stigma implicitly associated with post-secondary non-tertiary or short-cycle tertiary vocational education and blue-collar jobs.

Lifelong learning inherently requires that one learn how to learn and how to manage one's educational journey as part of a basic skillset. This is no mean feat to achieve by oneself and would require sustained input from educators before one exits mandatory schooling, in order to foster these habits and expand one's awareness of learning opportunities beyond conventional further education. Prolonged exposure to learning environments both within and beyond the classroom would eventually create a learning culture throughout society, as people realise the advantages of continuous education and actively pursue different educational opportunities without overt extrinsic motivation. Lifelong learning holds great transformative potential for learners of all ages and backgrounds, not just regarding their career paths, but also their values, morals, and characters as human beings.

6. Aspirations and goals for implementing applied education and lifelong learning

To that effect, several options are worth elaborating on and exploring as ways to implement applied education and lifelong learning extensively in communities and societies around the world.

On a macro level, governments should intensify coordination across different ministries and bureaux responsible for education, labour, economic, and social planning, pooling resources and efforts together for consolidation into coherent policy outcomes regarding talent development, whether through structural reform or assimilating existing platforms. A joint commission spanning various government bodies would be instrumental for short- and long-term educational progress grounded in relevant economic and social policy measures, instituting a framework for implementing the appropriate manpower strategies to fit market trends and requirements.

a. Potential policy directions for applied education

Applied education should be implemented and presented extensively at secondary, post-secondary, and tertiary level as a legitimate and recognised educational pathway for students interested in the applied sciences and hoping for more practical instruction that can lead to straightforward career paths. Offering further education opportunities, including in higher education, can signal that applied education at secondary levels is not an educational dead-end but a pathway to further learning and development. More and more countries are moving away from separate general and vocational programmes at secondary level, preferring instead comprehensive syllabi that integrate the both types of learning. Combined school- and work-based vocational education and training (VET) programmes that incorporate industry input into curricula are gradually becoming more popular worldwide; in the Czech Republic, around 70%

of upper secondary students opted for some form of VET, while the OECD average for upper secondary students enrolled in VET programmes stands at around 37%[7].

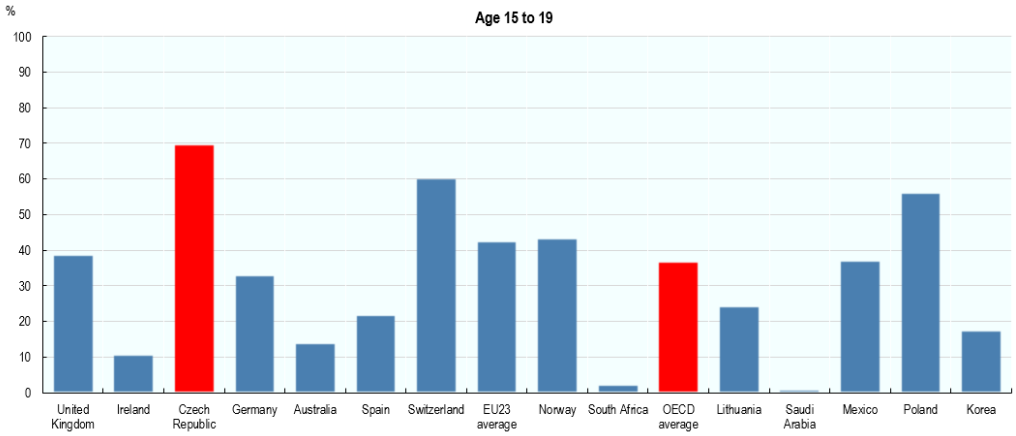

Figure 2: Share of upper secondary students enrolled in vocational education and training programmes, by age group (2018)[8]

i. Formalising and institutionalising career exploration

Career planning and exploration should also be formalised and institutionalised beginning at lower secondary level to boost applied education; possibilities include mandating career education as compulsory components in teaching with designated class hours, implementing in-depth experiential career programmes to facilitate greater career exposure, and organising exchange opportunities for industry practitioners and teachers in school settings. The introduction of industry- and sector-specific information can help students clarify their future career targets and understand what these jobs entail, avoiding potential widespread mismatch between education and career paths in future.

ii. Recognising and supporting corporate academies

Corporate academies are also integral to the delivery of applied education at multiple educational levels and should be encouraged with further funding or recognition if possible. The inclusion of corporate academy credentials in formal or industry recognised accreditation and qualification frameworks would lend these graduation certifications more credence in the professional sphere. Students would be incentivised to enrol in corporate academies feeding into stable career paths if they could also receive the equivalent of a professional qualification upon graduation that could allow them to flexibly transition to different firms or industries if needed, hence increasing the number of students taking up the applied sciences at non-academic settings more grounded in their respective industries.

iii. Establishing Universities of Applied Sciences

An issue that stands out is the dearth of applied education options available beyond secondary education on a level playing field with traditional academic options, especially at ISCED 2011 level 6 and beyond. Academic degrees at research-based universities remain the mainstream choice in tertiary and quaternary

[7] OECD, *Education at a Glance 2020: OECD Indicators*, 158
[8] Ibid, Table B1.2, 164

education, even for the teaching of professional skills, limiting the routes open to students with heterogeneous interests. Applied degrees' unparalleled ability to bridge academic theory and work training and in doing so, translate this capability into impact, could greatly drive technological development in vital growth sectors of the economy as newly trained talent enter these professions. Germany, Switzerland, and Singapore all have established UASs (known as the Singapore Institute of Technology in Singapore) in the past 20 years, exhibiting that the teaching of applied education at tertiary level to nurture industry-ready workforces is on the rise.

b. Potential policy directions for lifelong learning

Lifelong learning similarly deserves to be widely enacted and promoted across different countries for the benefit of all if we are to inculcate a culture of learning societies globally and stimulate individuals' intellectual, mental, and character growth. This can only be achieved if learning is celebrated and prized since childhood, and educational attainments viewed socially as achievements for education's own sake rather than merely for material or occupational gain; in other words, citizens must be socialised to desire continuous learning for their own personal and moral development first and foremost. That being said, it is also essential that students and working adults make use of lifelong learning to reskill and upskill themselves when needed, so that they can adapt to changing requirements in labour markets and stay ahead of the curve.

i. Accepting and accrediting micro-credentials

Micro-credentials are indispensable to the implementation of lifelong learning at the moment, given their flexible nature, easy accessibility on the Internet, and relatively lower prices. As miniature qualifications that help to demonstrate individuals' skills, capabilities, and knowledge in a given subject area or competence, micro-credentials allow those who cannot or will not access formal full-time education to learn in-demand information or abilities at their own convenience and be able to validate them to current and potential employers. In a study conducted by researchers at Columbia University, they found that 90% of those who had completed a micro-credential reported they had learned something new, and 38% claimed to have improved their performance at their existing jobs as a result[9]. In addition, the modularity, stackability, and peer exchange in micro-credentials enable learners to access education unbundled with other, similar learners. They should be incorporated into official accreditation and qualification frameworks if possible to facilitate wider recognition of these certificates in the professional settings.

ii. Providing technological resources and knowhow for all in learning

Policymakers should take advantage of the numerous ad-hoc responses in educational technology to the upheaval created by COVID-19 to realise comprehensive and groundbreaking learning infrastructure that ensures widespread, inclusive access to digitalised learning. Educational inequalities caused by poor economic situations and living environments have been exacerbated by the pandemic as many students in the world are forced to attend classes online in their homes. Students with less resources in technology and learning spaces available to them have been severely disadvantaged by the switch to online learning:

[9] Fiona Hollands and Aasiya Kazi, *Benefits and Costs of MOOC-Based Alternative Credentials: 2018-2019 Results from End-of-Program Surveys*, Centre for Benefits-Costs Studies of Education, (New York: Columbia University,) https://www.academia.edu/41001509/Benefits_and_Costs_of_MOOC_Based_Alternative_Credentials_2019

around 30% of students in Thailand don't have a quiet place to study in, while around 65% of students do not have access to a computer for schoolwork in Indonesia, and more than half of the students in the Philippines don't have a link to the Internet[10]. Hardware inadequacies aside, learners should be supported to acquire and update the requisite digital skills and technological literacy needed to participate in the modern workforce and in society as a whole by building on the existing properties and full potential of the open source movement.

iii. Encouraging and reinforcing workplace learning initiatives

Lifelong learning initiatives for working adults also require reconfiguration and support, given that workplaces and enterprises are potentially important learning environments and the nature of work is undergoing drastic transformation in so many areas. It is especially critical when taking into account the long hours spent at work by adults around the world: a UBS study in 2015 discovered that cities such as Hong Kong, Mumbai, Mexico City, and New Delhi have work weeks ranging from 50.1 to 42.6 hours[11]; the implications of these lengthy working hours are that professionals do not have much leisure time to spare for further study. It is therefore important that learning opportunities be personalised to reflect each worker's needs for the transmission of skills and experiences. This would entail government and employer support for various employee training programmes and guidance schemes, as well as temporal and financial assistance for employees undertaking continuing education.

7. Conclusion

Applied education and lifelong learning are integral towards delivering more dynamic and comprehensive education for every global citizen by 2050. If society wants to equip its learners with the requisite knowledge, skills, and guidance to navigate the turbulent shifts of the 21st century, then education, as the linchpin of fostering tomorrow's talent, must in turn also become more enterprising and inclusive.

[10] Fernando M. Reimers, and Andreas Schleicher, "A framework to guide an education response to the COVID-19 Pandemic of 2020"

[11] UBS Chief Investment Office, "UBS Prices and Earnings 2015", last modified 17 September 2015, www.ubs.com/pricesandearnings

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