Learning gains from COVID-19

Diversifying educational pathways and lifelong learning

Education for sustainable development

The emerging role of AI in education

Including a special pull-out: “ChatGPT: A tool kit for students and educators”
new normal? Educational institutions around the world acknowledge the need to adopt a broader view of education and provide flexible and inclusive educational pathways that allow for lifelong learning. Shariza Kamarudin shares the findings for Malaysia from a multinational study of flexible higher education systems, and recommends an increased focus on disadvantaged groups. Across the causeway, Robbie Goh discusses five current challenges faced by traditional universities, and introduces the Singapore University of Social Sciences as an example of an institution of higher learning with a heightened responsiveness to industry needs. Wesley Teter advocates the engagement of stakeholders in five key areas, even as an open and equitable architecture for learning and employment is being built for the region.

As we reflect on how a virus could wreak such havoc across the world, we are also forced to recognise the impact of our activities on the planet. It has been made increasingly clear to us that unless there is a concerted global effort to stop climate change in its tracks, the future of humanity and the planet will be at severe risk. Education has the capacity to equip the current and future generations with the knowledge and skills to ensure that there is sustainable development. Miki Sugimura gives a few examples of how the UNESCO Associated Schools in Japan have implemented sustainability education in their curriculum, and Jing Liu compares how schools in China and Japan promote sustainability education. Doria Abdullah, Miguel Antonio Lim and Reka Tozsa offer three perspectives that educators and administrators can adopt to contribute to the global goals for sustainable development.

Finally, this particular issue would not be complete if the latest kid on the block – ChatGPT – was not acknowledged. Ever since ChatGPT burst onto the scene with its launch in November 2022, the buzz surrounding it has not died down; indeed, it is only increasing as educators debate its utility in the classroom. Jonathan Y. H. Sim describes his own experience of using ChatGPT with his undergraduate students, and exhorts his fellow educators to embrace the opportunity to harness artificial intelligence (AI) to improve education. Krischachi Somsaman emphasises the importance of having proper guidance and policies for AI use in the classroom, and provides some tips to guide both students and educators.

We hope you enjoy this issue, and we invite you to consider contributing to future issues on educational trends happening in Southeast Asia and beyond.

Linda Tay
The HEAD Foundation
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KRITSACHAI SOMSAMAN
This article discusses the national impact of a global challenge in higher education, particularly in teacher education, from the institutional perspective of a country’s leader in the field. As the country’s National Center for Teacher Education, the Philippine Normal University (PNU) is mandated by law to lead in the development of educational practices and policies that inform legislation aimed at teacher preparation, teacher training, and continuing professional development of Filipino teachers. Faced with but unfazed by the recent public health crisis, PNU has endured and forged ahead to map the unexplored terrain of post-COVID-19 education. Propelled by the national education gains and driven by a renewed commitment to curb the negative effects of the pandemic on learning, PNU proposes a recovery and continuity roadmap that consolidates the visions, best practices and commitment statements of education leaders and experts generated during the International Conference on Quality Education in the New Normal (ICQENN), hosted by PNU and the Philippines’ Commission on Higher Education in November 2022. The roadmap, which formulates directions for other teacher education institutions (TEIs) in the Philippines to sustain education gains, covers perspectives and initiatives in the following key areas: 1) multi-stakeholder participation and representation; 2) transformative pedagogies for quality teaching and learning; 3) future-proof curriculum for teachers of tomorrow’s learners; and 4) practicable customisation for teacher quality support.

What COVID-19 didn’t disrupt

Decades of progress in many facets of education in the Philippines may have been wiped out by the pandemic in only two years. Systems and practices were shown to be fragile in the face of a public health crisis. However, the country’s efforts to ensure quality within the education sector were not drastically diminished by the dreaded disease. A shining example has been the development, adoption and strengthened implementation of the Philippine Professional Standards for Teachers (PPST), School Heads (PPSSH), and Supervisors (PPSS), Following

Sustaining gains in teacher education: Strengthening teacher quality in the Philippines

BERT J. TUGA, JENNIE V. JOCSION & ERHWIN A. CLARIN
in the country, allowing for more targeted training of current and aspiring teachers. The law, which underwent its most crucial consultations and deliberations at the height of the pandemic, also empowers the Philippines’ Teacher Education Council to effect more impactful actions to maintain the integrity of the professional standards for education professionals, and institutionalises the National Educators Academy of the Philippines to provide quality professional development programmes for teachers and school leaders. Such education gains reaped by the country’s education sector show that some good came out of a difficult time. It is clearly vital to take stock of the dismal statistics that throw light on the many vulnerabilities that challenged our existing education systems and practices. More beneficial, however, is to view them as a reminder of every educator’s noble duty to create new, alternative and innovative education practices that are aligned and compatible with the demands of the post-COVID-19 world.

When boundaries became boundless
Any post-COVID-19 education initiatives must involve careful, collaborative planning and extensive expert engagement through active conversations and meaningful discussions. Catalysing a national, if not global, discussion on how Philippine education needs to be rethought in a world of increasing complexity, uncertainty and precarity was achieved by a shift to multi-stakeholder participation in online consultations, which in turn allowed for improved representation and thereby ensured multi-sectoral involvement, wider partnerships, stronger government support, and community/civil society engagement in institutional goal-setting and operations. With geographical boundaries and barriers removed, and as evidenced by the successful International Conference on Quality Education in the New Normal (ICQENN) in November 2022 with the involvement of education experts from around the globe, virtual consultative forums and conferences have enhanced the conceptualisation and implementation of teacher education agendas and development initiatives.

How distancing transformed distance learning
Among the most pronounced impacts of the pandemic on teaching and learning has been the increased utilisation of online education. Access, the availability of technological infrastructures and income levels are still glaring concerns, but the question of effectiveness, including whether or not such a pedagogical framework enables the development of holistic, future-ready teachers who can genuinely deliver quality instruction and bring about enhanced student outcomes, is gradually being addressed through vigilant monitoring and evaluation, and quality assurance of innovative teacher education pedagogical models and diversified delivery design for quality and transformative flexible learning.

The ultimate goal of transforming the teaching-learning experience in teacher development programmes by integrating needs-responsive and holistic digital learning pedagogies gained even more impetus with the careful development, phased implementation and institutionalisation of Aralan sa Bagong Kadawyan,1 PNU’s own brand of flexible learning modality. This ground-breaking learning delivery programme adequately represents every Filipino educator’s pioneering spirit — confident, pliant, yet resilient amid challenges, like the bamboo (“Kawayan”) or the sway of the hand (“Kaway”). It has allowed PNU to mitigate the learning crisis and disparities, and enabled its students and teachers to navigate the unfamiliar frontiers of learning in the new normal.

1. The Filipino word “Kaway” means “a place to learn or study” and “dawi” means “root”. The word “Kawayan” in Ilocano, one of the many Philippine languages, and means “normal” as derived from “blaw”, which translates as “custom” or “habit”.

Reimagining the future of teacher education entails the alignment of the curriculum with educational priorities geared at addressing future challenges and prospects.
Where post-pandemic and future-ready meet

Reimagining the future of teacher education entails the alignment of the curriculum with educational priorities geared at addressing future challenges and prospects. Urgent measures must be taken to provide teacher education institutions with “curricula of the future”, allowing teachers to envision and enact new forms of learning and acknowledging specific and diversified learner contexts and a highly-developed knowledge economy.

Interestingly, the pandemic has not only facilitated PNU’s successful migration from traditional to convertible flexible learning, but has also allowed it to refine its outcomes-based curriculum framework. Refining the teacher education curriculum means ensuring that it is attuned to the future, and informed of the realities, demands and opportunities that were revealed by the health crisis and other national/global shifts and directions. Envisioned to serve as an innovative curricular model for other teacher education institutions, the new framework, along with its multi-pathway ladderised delivery design, promotes flexibility in the selection and crediting of courses relevant to a needs-based, self-designed, and self-directed student-centred “curriculum of the future” for tomorrow’s learners. It provides a firm grounding for the many developments in curriculum, teaching and school leadership in the new normal, and guarantees that the various education imperatives revealed by the rapidly changing teaching and learning post-COVID-19 landscape can be addressed.

How supporting teachers ensures quality education

In its most recent report the country’s basic education sector highlighted the need to provide support to teachers, whom the Education Secretary dubbed “the lifeflood of the Department of Education”. This priority aligns seamlessly with not only the Philippine Development Plan 2023–2028, which involves the improvement of teachers’ competencies in its strategy framework for education and lifelong learning, but also with Sustainable Development Goal 4 on quality education, which aims “to substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries”. Furthermore, UNESCO’s direction for supporting teachers is clear: since teachers are the key to quality education, they must be sufficiently supported within well-resourced and effectively-governed systems.

Learnings gleaned from and opportunities brought by the PNU experience during the pandemic have also been shaped into the innovative, customised delivery of its graduate programmes, and specialised training to support the continuing professional development of teachers and education leaders in the country. Another testament to the transformative effect of the pandemic, which removed the geographical and infrastructural barriers of in-person education delivery, is the Linking Standards and Quality Practice (LiSQuP) programme geared towards “making quality practice common practice” among basic education personnel who hail from different parts of the archipelago. By developing customised systems and processes, including a responsive programme framework, a delivery model that integrates academic and specialised training courses with job-embedded learning grounded in the educator’s workstation, and flexible learning modes and gateway assessment strategies, PNU is able to address the perceived and projected support needs of teachers and school leaders in the country, while personalising their learning journeys and adopting appropriate models for delivering competency-based education.

Concluding remarks

Regardless of whether the gains that were reaped during the most difficult period in our recent history remain unnoticed or undocumented, the opportunity to gauge the usefulness of existing traditional practices in light of learnings and experiences from the pandemic has enabled every teacher education institution to develop improved pedagogies and innovative models that are more suitable and responsive to the needs of both teachers and learners in the new normal. In this, we no longer dwell only on the accumulated learning loss that the education sector suffered, but focus instead on formulating targeted strategies to reinvent Philippine education so that it can withstand the erratic and unpredictable nature of the present era. Strategically mapping out ways forward, guided by the carefully and collectively crafted Teacher Education Recovery and Continuity Roadmap, will boost our vital endeavour to stimulate innovation, introduce possible routes for education reforms, upgrade and improve learning pedagogies, invest in more efficient school governance mechanisms, and gain a deeper understanding of education quality in the new normal, while continuously addressing national and global development goals.

Source: Philippine News Agency

The opportunity to gauge the usefulness of existing traditional practices in light of learnings and experiences from the pandemic has enabled every teacher education institution to develop improved pedagogies and innovative models.

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Re-thinking norms and practices in a changing learning space

DORIA ABDULLAH & HADIJAH JAFFRI

On 18 March 2020 Malaysia went into full lockdown to curb the spread of COVID-19. At that time we were just about to enter the second half of the academic semester, and classes were suspended initially for two weeks as we made the necessary adjustments to academic policies and guidelines in support of online teaching and learning activities.

Since then we have experienced at least three semesters of online learning, and two semesters of hybrid learning. Learning finally resumed in full physical mode in October 2022. Today, it is such a relief to see our campus buzzing with people and activities after an extended period of calm.

As academics, the period between March 2020 and October 2022 marked an interesting time for us. The first few months were characterised by long days of converting teaching materials into formats that were accessible online, video recording and editing, as well as reviewing and redesigning course assignments and tasks. Our mailboxes were inundated with advisories from the faculty and the university on how to conduct effective online learning for our students, as well as messages from students with queries and requests for clarification relating to our courses. As time progressed we grew accustomed to the ups and downs of online teaching, and were able to adapt to these changes in classroom practices.

Despite all the challenges, we are grateful for the experience. Conversations about technological disruptions in teaching and learning were common pre-pandemic, but they were assumed to be fads which could be dismissed or dealt with when the need arose. However, during the various lockdown iterations our assumptions about teaching and learning were tested in different ways, which required us to be flexible and creative with the resources we had available. We also realised that it was the little changes made in our daily instructional practices that had the most impact on our students.

In this article, we offer three case studies that reflect our attempts to re-think norms and practices. These are tried-and-tested practices that are still implemented in our classrooms to this day.

In the initial months of the first lockdown we found that some students did not have access to digital devices and/or the internet. In the physical learning environment they relied on the university library and computer laboratories on campus to study and complete their assignments. However, during lockdowns they often had to share their devices and broadband connections with their siblings who also had to attend classes online, and in some cases with their parents who were also working online from home.

Our students’ limitations in digital access prompted us to revisit our course delivery to ensure that all learning activities were inclusive for all students. We restructured course syllabi to enable parts of the learning modules to be delivered synchronously, while allowing students follow the remainder of the modules on their own. We encouraged students to be more proactive and self-directed in their learning, driving home the message that learning can happen at any time and anywhere beyond the physical classroom. In terms of lesson planning, we provided copies of our lesson plans to students on our course learning management system (LMS) as a guide for them to structure their learning. In addition, we also began to utilise messaging applications such as Telegram and WhatsApp in our teaching and learning. Even if they did not have a laptop or computer at home, students could still receive educational materials distributed via Telegram.

In this article, we offer three case studies that reflect our attempts to re-think norms and practices.

#1: Synchronous/Asynchronous learning

In the initial months of the first lockdown we found that some students did not have access to digital devices and/or the internet. In the physical learning environment they relied on the university library and computer laboratories on campus to study and complete their assignments. However, during lockdowns they often had to share their devices and broadband connections with their siblings who also had to attend classes online, and in some cases with their parents who were also working online from home.

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They joined lessons virtually from different locations, and shared their thoughts and experiences as part of the session. Such opportunities strengthened the theory-practice interface for the students, as they were able to interact directly with the external contributors through Q&A sessions at the end of each session. For the experts and practitioners the sessions provided avenues for knowledge-sharing at a more focussed level, since their presentations were structured based on the learning outcomes applicable to the sessions concerned.

#3: Explore alternative assessment practices
Course assessments pre-pandemic typically involved quizzes and tests, as well as individual or group assignments assessing students' comprehension or their ability to apply, evaluate or synthesise meaning from the content delivered in class. During the pandemic we realised that such practices provided only surface-level indications of the students' mastery of the topics taught in class. We were also unsure whether our students were genuinely engaging with the content and/or the tasks given.

We reviewed our assessment practices for our courses, and rethought the relevance of each assessment to student learning. We gave flexible deadlines on take-home tasks and assignments, and taught students how to work effectively in teams via online applications and platforms.

For example, in a postgraduate-level course on personality psychology, written test questions and project prompts were re-designed to emphasise the students' reflexive ability. For example, the students were prompted to undertake personal sketches and lexical analysis of traits and reflect on the coping strategies that they used to overcome stress due to the pandemic, based on the underlying psychology theories they had learnt throughout the semester. Feedback from the students indicated that the test questions and project prompts underlined the importance of personal reflection in learning, and they also felt “heard” during the pandemic, since their assessments enabled them to articulate their anxieties and uncertainties.

Conclusion
COVID-19 provided a much-needed push for us to reimagine teaching for our students, having become accustomed to the physical classroom as the primary learning space for a significant portion of our teaching careers. One consolation throughout the pandemic was that help was all around us; there are many resources related to online teaching and learning that are readily available online. The university also offered help desks and round-the-clock technical assistance for everyone.

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Malaysia’s strategic goals for economic and social growth have incorporated the fourth industrial revolution (4IR) as the focus for the country’s development planning, guided by its aspiration to break the so-called middle-income trap. The country is still lacking enough skilled and experienced workers for 4IR, which is mostly technology-intensive, and to a certain extent this can affect people’s living standards as they cannot invest in higher productivity activities. Empirical evidence has shown that disadvantaged groups like those with the lowest income (the so-called B40), ethnic minorities, indigenous groups and persons with disabilities (PWDs) cannot guarantee their financial well-being because they lack specialised job qualifications and skills, as a result of not having the education to obtain proper employment.

Malaysia’s lifelong learning policy for higher education was introduced in 2006 primarily for human resources development among non-traditional learners, intending to provide a highly skilled labour force. Influenced by international movements like the Sustainable Development Goals (SDGs), Malaysia has adopted equity and inclusivity as the focuses of its national planning and translated them into higher education strategic plans. The Malaysian Education Blueprint 2015–2025 (Higher Education) and the Strategic Plan for Higher Education: Laying the Foundation Beyond 2020 highlighted equity as an important agenda to ensure that all Malaysians can fulfil their potential regardless of their background.

International research on flexible learning pathways

UNESCO’s International Institute for Educational Planning (IIIEP-UNESCO) launched the ‘SDG 4: Planning for Flexible Learning Pathways in Higher Education’ project in 2018 to support worldwide efforts to promote equity and lifelong learning opportunities for all by investing in flexible higher education systems. This initiative became even relevant during the COVID-19 pandemic. Part of the research related to this SDG includes in-depth case studies of eight countries working to increase...
flexibility in their higher education provision, namely Chile, Finland, India, Jamaica, Malaysia, Morocco, South Africa and the United Kingdom.

The Commonwealth Tertiary Education Facility (CTEF) led the Malaysian case study in conjunction with the Ministry of Higher Education Malaysia, the National Higher Education Research Institute, Universiti Sains Malaysia, and the Malaysian Qualifications Agency. Interviews were conducted with national and institutional higher education stakeholders and the top management and implementers at relevant agencies. One public university and one private university were selected as case studies to allow a comparison. Focus group discussions were conducted with former and current students from both institutions.

**Definition of flexible learning pathways**

The UNESCO definition of flexible learning pathways (FLPs) encompasses ‘entry points and re-entry points at all ages and all educational levels, strengthened links between formal and non-formal structures, and recognition, validation and accreditation of the knowledge, skills and competencies acquired through non-formal and informal education’. Malaysia’s research focuses on all stages related to students/learners in higher education systems, which consist of getting into higher education (for the first time and also later on in life), getting through courses of study (progression and transferability), and getting out (completion and transition to the labour market or further study), including the importance of strong governance and technology advancement in higher education systems.

**The research findings**

**AT NATIONAL LEVEL**

**Strong political support but lack of awareness at national level**

Many national policies under the broader agenda for lifelong learning have been initiated by the government and implemented at the institutional level. However, key information on relevant and updated policies supporting FLPs, including equity matters, must be properly disseminated to the government administration involved in the policy implementation.

**The data system is not standardised at national level**

Information on FLPs for entering higher education and the labour market, especially in relation to disadvantaged groups, should be collected properly and regularly at the national level. The definitions of disadvantaged groups need to be more clearly delineated, standardised and disaggregated for evaluation in order to see the impacts and benefits of FLPs on different groups.

**FLPs have improved access, but lack a specific policy to link FLPs to disadvantaged groups**

Although there are many national programmes and funding initiatives to widen access to higher education for disadvantaged groups, there are still limitations in access and retention for these groups in higher education due to their lack of awareness of educational opportunities. One of the main reasons for this is the lack of promotion of FLPs to targeted groups such as people from ethnic minorities, PWDs and B40 households.

**FLP policies at institutional level lack monitoring and evaluation**

Malaysia needs a national mechanism to monitor and evaluate the level of implementation or effectiveness of FLPs in institutions. Public higher education institutions only report data they deem relevant, while private institutions are not obliged by law to report to the Ministry on their activities and performance, particularly in relation to disadvantaged groups.

**AT INSTITUTIONAL LEVEL**

**FLPs in institutions lack room for creativity and innovation**

The government has supported the implementation of FLPs in Malaysia through development and investment in FLP practice, and by elaborating the Malaysian Qualifications Agency guidelines on FLPs to promote implementation. However, the guidelines discourage HEIs from demonstrating creativity and innovation, particularly in terms of offering a broader range of flexible opportunities for learners, especially disadvantaged students.

**Limited expertise in developing initiatives and instruments for FLPs**

More support and capacity are needed from the government to support the implementation of FLPs at the institutional level. Many HEIs are unprepared to implement FLP programmes due to limited numbers of staff with expertise in developing relevant initiatives and instruments in the Malaysian context. Academic staff and administrators also lack sufficient knowledge and guidance to implement relevant FLP modalities.

**Graduate employability matters, but there is a lack of engagement with and support from the labour market and employers**

As important stakeholders in the labour market, the Malaysian Employers’ Federation has participated in inter-ministerial policy meetings. However, there is still a lack of support among employers to encourage employees to advance or upgrade their skills through continuous studies while working.
APEL is not implemented comprehensively across higher education sector

Malaysia’s Accreditation of Prior Experiential Learning (APEL) programme – APEL A for access and APEL C for credit transfer – considers the most appropriate programmes for facilitating disadvantaged groups to participate in higher education. APEL, implemented in 2011, recognises the non-formal and informal learning that learners accrue through their work and life experiences, serving as an alternative admission pathway for qualifications such as Bachelor’s and Master’s degrees. APEL centres provide guidance, counselling and testing services for learners. However, only a few APEL centres exist in HEIs in Malaysia, and these are not located in prestigious universities. The APEL C credit transfer programme is infrequently implemented in HEIs due to issues related to mapping courses between faculties within the same HEI and between one HEI and another. Moreover, the lack of promotion of FLP modalities like MOOCs and micro-credentials at institutions has also impacted APEL’s implementation.

Recommendations and ways forward

1. Establish a national policy framework for data management

Data collection and a clear linkage of FLPs with equity and disadvantaged groups should be implemented. The definitions of equity and disadvantaged groups must be standardised across Ministries to avoid data discrepancies and misinterpretations.

2. Create a dedicated entity for disadvantaged groups

Establish an entity at the national and institutional levels to meet the objective of facilitating FLPs for disadvantaged groups and address equity issues in higher education. This entity should oversee, monitor and evaluate FLP policies and practices.

3. Integrate support systems for disadvantaged students

Support systems for FLPs for getting into, getting through, and getting out of higher education must be in place. More APEL centres should be created to provide information to assist disadvantaged learners. Innovative and creative strategies should cater to the different needs of learners, including facilities to enable participation by these groups, such as facilities for PWDs, affordable childcare at HEIs and support for flexible working hours.

4. Build capacity in local expertise to develop FLPs

The government should support HEIs with funding and human resource development initiatives related to FLPs, to enable capacity building in developing local expertise.

5. Engage with all stakeholders and beneficiaries

Dialogue with experts, the public and disadvantaged groups can build healthy and committed partnerships. Work-based study programmes such as the 2u2i policy, which consists of two years in university and two years in industry, help to create such opportunities.

The spirit of having a higher education system is to develop critical thinking and creative minds, with the potential to improve human well-being and eliminate inequalities and inequities.

Lifelong learning through FLPs can create opportunities for disadvantaged groups which may not be able to compete in the context of traditional routes into and through higher education. Alongside other countries, Malaysia already has good policies and practices in place in relation to FLPs, and could play a leading role in the Asian region in promoting FLPs with a focus on disadvantaged groups.


SHARIZA KAMARUDIN is Project Officer, Commonwealth Tertiary Education Facility (CTEF).
Lifelong learning: The role of the university in a crowded and diversified landscape

ROBBIE GOH

The need for lifelong learning and continual upskilling is well recognised in modern life. Most educators and policymakers would acknowledge that the older model of pre-employment training does not fully meet current needs, due in large part to the speed at which jobs are changing and industries are being disrupted. It does not seem possible to equip workers with the skills they will need over their entire career lifespans with just the training they receive up to and including their undergraduate degrees. Some skills (e.g. communication or leadership) are more transferable and enduring than others, and these are good candidates for some kind of “core” training at undergraduate level. For disciplines with close industry applicability, however, the reality is that continual upskilling and reskilling are unavoidable.

One might think that universities – especially large comprehensive universities with a global brand – would be in a commanding position to lead this upskilling and reskilling project. However, they do face a number of inherent challenges. By “inherent”, I mean that these challenges are not necessarily the result of traditional practices or temporary conditions that can be changed easily; rather, they may be a result of the very nature and structure of the comprehensive global university.

**CHALLENGE #1**

A crowded educational landscape

The adult education market is crowded and has many competing players, including private colleges, online learning providers, corporate or trade and industry academies, and so on. Some of these providers are by definition and nature much more closely aligned with their target industries, and thus also more in tune with changing needs, than the universities. Clear examples of this would be corporate or trade and industry academies, or the programmes run by Trade Associations and Chambers.

**CHALLENGE #2**

The lack of a “for profit” advantage

A private education provider whose sole *raison d’être* is to cater to the educational markets has considerable advantages over universities, which have a number of other KPIs and purposes. There is nothing to stop the strategy and governance of the “for profit” educational provider being completely aligned with market trends and needs. In contrast, comprehensive global universities are in many ways public institutions, with a larger social purpose and different groups of stakeholders to answer to.

**CHALLENGE #3**

A greater focus on “core” competencies than on “targeted” competencies

Upskilling and (to a certain extent) reskilling in many ways measure “targeted” competencies – the particular and relatively narrow sets of skills required by industry changes. A mid-career engineer does not need to entirely repeat their engineering training, but may need very specific skills updates in (say) sustainable processes or the latest developments in relevant material sciences. However, the engineer is also the product of a larger set of comprehensive and largely transferable “core” skills, including things like communications, teamwork, design thinking, digital competencies, human capital management and others. Universities are very well positioned to impart core competencies, which specialised educational providers cannot do. However, core competencies, while absolutely crucial to the individual over an entire career and lifespan, are harder to measure in terms of targeted industry-aligned competencies.

**CHALLENGE #4**

A lower degree of flexibility due to the “idea of a university”

Universities answer to a basket of expectations and purposes which might be summed up in John Henry Newman’s phrase (also the title of his 1852 work) “the idea of a university”. While different stakeholders may have slightly different perspectives on this idea, in general we can take it to mean that the university is a site for the generation and circulation of ideas, and for the pursuit of knowledge. Knowledge and ideas can obviously have a very applied and applicable dimension, but the “idea of a university” means that the institution can be a nursery for knowledge and ideas whose application has not yet come, or which may never have directly applied value. Comprehensive universities are magnets for people who value knowledge and ideas primarily for their own sake, and perhaps secondarily for any marketable applicability they may have. This means that universities must have a “surplus” or “ballast” of resources – faculty members, disciplines, courses, infrastructure – beyond what is needed to produce purely practical knowledge. For-purpose and just-in-time training providers, with their very different functions and purposes, have greater flexibility and responsiveness to industry needs precisely because they do not serve this “idea of a university”, and therefore do not require that “surplus” or “ballast” of resources.
The value of the university in an era of lifelong learning

Universities arose and established their characteristics well before Industry 4.0 and the era of continuing education. Despite this, and also despite the inherent disadvantages listed above, the structure and nature of the university does generally confer certain relative advantages in the era of lifelong learning, as the above points also suggest. Universities have a crucial advantage as recognised intellectual hubs, and consequently in the depth and breadth of the expertise, knowledge and skills they possess. When it comes to research in both upstream and downstream areas, in areas with specific industry applications as well as in those with less applied benefit, universities possess a richness that specialised for-purpose educational providers cannot match. This richness of knowledge confers a distinct character to university courses (including continuing education courses); above and beyond targeted skills, university courses can be backed by a “bank” of intellectual talent and resources that reflect their status as knowledge hubs. We might think of university courses as potentially offering “skills+” training – not only the targeted competencies, but the adjacent experience, knowledge and perspectives that arise out of the university’s richer standing talent pool.

Universities also have the value of their brand, which is useful not only in attracting individual students as well as educational partners from both the private and public sector, but also in the role of an accreditor of learning. Universities generally offer trusted names to back whatever continuing education courses are on offer. They also tend to have wide visibility and networking; while corporations (unless they are household names) may often have to explain their core business and raison d’être, a university is a widely visible entity whose core business of education and training is a given. The result is that SUSS offers many of the advantages of universities (albeit with a shorter history and a brand that is still in the process of being established), while perhaps being nimble and more responsive to industry changes than some of the older and larger comprehensive institutions. SUSS does possess the intellectual “surplus” or “ballast” to provide core, transferable skills, and also has ample expertise in a wide range of applied disciplines to offer targeted industry upskilling and reskilling. It offers the credibility of being one of the six autonomous universities under the Singapore Ministry of Education, and has clear visibility and purpose within the vast and diversified global educational landscape.

Tapping on industry talent

SUSS has a larger ratio of associate faculty, drawn from various industries, than the traditional university. This allows the university to bring current industry practices into the classroom, interwoven with curricula designed in partnership with research-active full-time faculty. Its pedagogy, based on flexible modes of delivery appropriate to both its full-time and part-time degree studies, is suited to the learning patterns of working adult learners. This is reinforced by its Institute for Adult Learning (IAL), with its extensive research and practice in andragogy and workplace learning.

The Singapore University of Social Sciences (SUSS) experience

SUSS, being a relatively young university (established in 2017 as one of Singapore’s six “autonomous universities”, but with a longer history as a private education provider prior to 2017), has been well positioned to adapt to recent trends. With a whole-of-university remit to do social good and a strong applied dimension in its research, SUSS encourages colleagues to undertake service, research collaborations, consultancies, and other forms of engagement with both private and public sector entities. A holistic system of performance assessment ensures that these activities are recognised for career advancement, alongside teaching, upstream research and leadership. Despite its name SUSS does not only offer typical social sciences disciplines, but is fairly comprehensive in its offerings, which include Business, Law, Engineering, Science, as well as disciplines in the Humanities.

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Conclusion

Post-tertiary higher education will continue to evolve extremely rapidly, especially as the impact of AI on various industries (and on education itself) becomes fully realised. It is therefore incumbent upon all educational providers to anticipate and meet the needs of lifelong learning.

Partnerships with clients and private sector academies

A central principle of SUSS’s lifelong learning model is the “3 Cs” of partnership: to “customise”, “co-develop” and “co-deliver” learning in collaboration not only with other universities but also with non-university partners. SUSS actively works with SMEs and corporations to develop training that is eminently suitable to a client’s needs, and often incorporates into the classroom the teaching capabilities of the client’s own management and trainers. SUSS’s applied research arm is also able to support clients (whether corporations or government-linked agencies) in doing specific business or pedagogical research to enhance the client’s operations.

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Throughout Asia and the Pacific, there are growing concerns about the lack of progress in providing relevant education and training for life and work. The impacts of COVID-19 exacerbated learning poverty worldwide, and made it clear that we cannot rely on traditional education systems that underperform and perpetuate inequalities (Tawil & Camille, 2023). Based on the latest trends, the Asia-Pacific region will miss the targets of the Sustainable Development Goals (SDGs) by several decades. Only 15% of the necessary progress has been made at the midpoint of the agenda (UN ESCAP, 2023). To achieve the 17 SDGs, including quality education (SDG4) and decent work opportunities for all (SDG8), we need a new collaborative approach and digital transformation for learning and employment.

Innovations such as verifiable credentials (VCs), rich skill descriptors and Learning and Employment Records (LERs) are reshaping how we recognise learning outcomes from academic and work-based learning. As this new open architecture evolves, how will learners in Asia and the Pacific be able to manage their learning data and shape their futures?

During a regional symposium for Asia and the Pacific held in Singapore (20 April 2023), industry leaders and practitioners from the Groningen Declaration Network (GDN) met to discuss digital mobilisation efforts and a call to action to enable learner mobility, cross-sector collaboration and system interoperability across institutions and regions (Groningen Declaration Network, 2023). To organise this work worldwide, UNESCO’s new Digital Transformation Collaborative identified five keys to unlock potential across diverse settings (UNESCO, 2023b) (Figure 1). In Singapore, these ‘5Cs’ were used to explore an open and inclusive digital architecture for learning and employment across Asia and the Pacific.

1. **Coordination and strategic leadership**
   A policy-based approach can provide strategic and coordinated leadership at multiple levels. Coordination mechanisms need all countries and diverse stakeholders on board to be effective, but engagement in Asia-Pacific remains limited. Regional policies such as the Tokyo Convention promote the fair and transparent recognition of learning and qualifications, but they are underutilised. No countries in Southeast Asia have ratified the Tokyo Convention on qualifications recognition, and only Australia and Japan have ratified the Global Convention on Higher Education as of March 2023. These gaps in policy adoption will leave the region underrepresented at the Asia-Pacific and global levels. Strategic national and regional leadership are key for representation and learner engagement.

2. **Cost and sustainability of platforms**
   In 2022, with support from the European Commission, stakeholders in Southeast Asia launched a roadmap to create a common higher education space in ASEAN, including plans for mobility programmes, virtual exchange and digital credentialing (ASEAN, 2022). All government need to invest in publicly accessible platforms that offer personalised and engaging learning experiences. Private
providers of MOOCs have been instrumental in expanding access to online learning, yet those benefits disproportionately benefit elite learners who are already enrolled in higher education. It is important to ensure that public resources are invested to renew open platforms, including reinventing open universities and networks such as the Asian Association of Open Universities (AAOU). Robust investments in innovation will ensure that the benefits of the digital transformation are accessible, strengthening education as a public endeavour and a common good throughout the wider region (UNESCO, 2021).

4. Capacities for innovation and cultural variations

The OECD recognised that private sector engagement in public education systems has been the driving force behind most technological and social innovation in education (UNESCO, 2023b). In the Asia-Pacific region, it is crucial to develop new capacities for innovation that take into account cultural variations and diverse settings. One example of such innovation is the Indonesia Cyber Education (ICE) Institute, which offers quality-assured courses including micro-credentials for game developers. Through a local consortium and in partnership with industry, learners can acquire entry-level skills and demonstrate their competencies in a flexible and personalised way, creating their own unique learning pathways (ICE Institute, 2023). It is essential to understand local capacities for innovation across sectors, and recognise which offerings are valued by learners and employers.

5. Content and curriculum that is relevant for life and work

Finally, the content and curriculum of education and training programmes must be relevant for life and work. This requires engaging with industry, entrepreneurs and other stakeholders to identify emerging trends and skills gaps, and developing programmes that equip learners with the competencies they need at different points in life. Together with UNICEF, new gateways to public digital learning are taking shape to establish and iteratively improve national digital learning platforms (UNESCO, 2023a). Major content platforms such as XuetangX, KMOOC, ThaiMOOC, the ICE Institute and others in the Asia-Pacific are analysing labour market demand, sharing content, and working to localise offerings for diverse learners in the Asia-Pacific region. Content providers and networks within and outside the region, combined with advances in AI, will create an ever more complex landscape.
Together, we can co-create a future where all learners have equitable access to quality education and employment opportunities adapted to their unique cultural backgrounds and circumstances.

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for individualised learning pathways. More open and accessible content requires intentional monitoring to assess impact and value.

Given the rapid growth and huge interest in work-ready micro-credentials, quality controls for recognition will be daunting – open standards and trust building can drive innovation that is inclusive. Examples such as the Digital Credentials Consortium’s Learner Credential Wallet and the Learning Economy Foundation’s Learncard are part of a growing movement to create an interoperable and open infrastructure for digital credentialing (Digital Credentials Consortium, 2023; Learning Economy Foundation, 2022). To help build consensus UNESCO will work with diverse stakeholders and networks, including the GDN, to prepare an international quality framework for micro-credentials; the aim here is to co-develop an internationally agreed definition, standards for quality assurance, and principles for stacking and interoperability (UNESCO, 2022). The quality framework should be based on an open digital learner data ecosystem that facilitates mobility by enabling learners to share their credentials and learner data between different education and training providers as well as job platforms (International Micro-Credentials Summit, 2023).

To measure progress, governments must renew their commitments to produce relevant, timely, granular and high-quality data, especially in relation to the SDGs (UN ESCAP, 2023). Currently the Asia-Pacific region has less than 60% of the indicator-level data for SDG4 and SDG8 available. Researchers can help to overcome gaps in the quality education and employment opportunities Pearson et al., 2023) for SDG4 and SDG8 available. Researchers can help to overcome gaps in the quality education and employment opportunities available. Monitoring implementation of the Tokyo Convention on recognition: A multi-stakeholder approach to the internationalization of higher education in the Asia-Pacific. International Journal of Comparative Education and Development (IJCED), Special Issue: Internationalization of higher education in the Era of SDGs: Asia-Pacific Perspective, 23(3), 157–174.


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To measure progress, governments must renew their commitments to produce relevant, timely, granular and high-quality data, especially in relation to the SDGs (UN ESCAP, 2023). Currently the Asia-Pacific region has less than 60% of the indicator-level data for SDG4 and SDG8 available. Researchers can help to overcome gaps in the available data to inform strategic decisions and policy implementation. Open government data are fundamental commitments to transparency, and underpin an open architecture for learning and employment. Such data are critical for monitoring complex accountabilities (i.e. transparency, liability, legitimacy, responsibility and responsiveness). These five competing dimensions of accountability inform our understanding of what is locally relevant in a given policy context (Teter & Wang, 2021). New measures are needed to build a culture of accountability at multiple levels and across sectors.

Going forward, UNESCO has a theory of change for the Digital Transformation Collaborative to advance innovative partnerships. To map the openly accessible resources and quality content, the new gateways to public digital learning initiative will introduce opportunities and challenges that stakeholders in the Asia-Pacific region can actively shape. With policy guidance and investment, a decentralised and open approach can empower policymakers, education and training institutions, edtech providers, local and international industry and lifelong learners. Together, we can co-create a future where all learners have equitable access to quality education and employment opportunities adapted to their unique cultural backgrounds and circumstances.
Education for sustainable development

Education for Sustainable Development (ESD) is one of the key themes of education in the international community today. Japan has been enthusiastic about the development of ESD, and during recent decades the number of UNESCO Associated Schools promoting ESD in Japan has grown rapidly from 16 in 2005 to 1,115 today. ESD is positioned along with Global Citizenship in Target 4.7 of the Sustainable Development Goals (SDGs). This paper introduces the policy and guiding principles related to ESD in Japan, and examines two case studies of public primary and junior secondary schools to share some tips on how ESD can be developed in schools across the Southeast Asia region.

Policy transition on ESD in Japan

UNESCO Associated Schools (hereafter UNESCO Schools) were created in 1953 to incorporate the principles set forth in the UNESCO Charter into educational settings offering international education. Nowadays UNESCO Schools have been developed into the UNESCO Associated Schools Project Network (ASPNet). The number of UNESCO Schools in Japan has increased rapidly during the past two decades, from only 16 in 2005 to 1,115 in March 2023. This represents approximately 10% of the 11,500 UNESCO Schools in 182 countries around the world. Meanwhile, the Japanese Government has also been emphasising the promotion of ESD with the current Courses of Study encouraging the creation of leaders of a sustainable society.

Today, not only UNESCO Schools but all schools in Japan are encouraged to participate in ESD. In fact, UNESCO Schools in Japan engage in a wide range of activities, including environmental education, disaster prevention and the revitalisation of local communities, although their activities are not well known at home and abroad. UNESCO Schools are
positioned as centres for the promotion of ESD, in order to develop and nurture leaders of a sustainable society.

Japan’s Ministry of Education, Culture, Sports, Science and Technology (MEXT) introduced its Guidelines for UNESCO Schools in 2012. MEXT also created the Guide for Promoting ESD, which was revised in 2018 and 2021. Furthermore, in 2021 the second national implementation plan for ESD was compiled, confirming that related ministries and agencies would work together to implement the plan, ESD would contribute to the realisation of the SDGs, and activities would be developed in line with these five priority areas and involving a variety of stakeholders.

Guiding principles of ESD in Japan

In Japan, the following are examples of abilities and attitudes emphasised in the learning guidance, from an ESD perspective:

1. The ability to think critically;
2. The ability to predict and plan for the future;
3. The ability to think multilaterally and comprehensively;
4. The ability to communicate;
5. A cooperative attitude towards others;
6. Understanding the value of connections; and
7. A willingness to participate in all endeavours.

These elements are linked to the following three principles of Japan’s academic courses. The first principle relates to the approach to learning. It is important to constantly improve learning and teaching methods from the perspective of ‘independent, interactive, and deep learning’. The focus here is on emphasising the enquiry-based learning process by appropriately positioning problem-solving learning, increasing opportunities for learner-centred and independent learning, and not only incorporating experiences and activities but also examining how to effectively integrate them into the learning process. Group activities are incorporated to make learning more cooperative, with students discussing, collaborating, investigating, summarising and presenting their findings.

The second principle pertains to what will be learned. We aim not only to ‘cultivate the ability to put into practice’ knowledge and understanding, but also to apply what we learn and act on various issues, treating them as ‘our own problems’. In addition, by being aware of the perspective of ‘building a sustainable society’, we can elicit a change in the values of children and students.

The third principle addresses the issue of how to effectively promote ESD. In order to do so, it is important to position its implementation in school management policies, develop an internal school organisation, systematically work on ESD throughout the school, appropriately position ESD in teaching plans, incorporate the perspective of collaboration with the community, universities and businesses, and ensure that students communicate and reflect on their learning outcomes appropriately. It is also important to appropriately reflect on the learning results and disseminate them to students.

Cases of ESD practices in Japan

#1: Incorporating ESD into curriculum design focussing on the school community

Niigata Elementary School in the Niigata Municipality is a good example of incorporating ESD into curriculum design. The school first reviewed its educational objectives and organised a new curriculum, identifying the qualities and abilities of learners it wanted to nurture based on the demands of society, the actual conditions of the students, and the results of a parent-teacher survey. Considering the six abilities and attitudes defined in the Guiding Principles of ESD in Japan as mentioned above, the school set the goal of nurturing children who can think and collaborate on their own by putting importance on ‘the ability to take on challenges’, ‘the ability to persevere’, ‘a spirit of mutual recognition’ and ‘a spirit of mutual support’.

The school is promoting ESD within its four core learning topics. The first topic of ‘understanding the local community’ is conducted as Community Exploration Learning in ‘Seikatsu (Socio-environmental studies)’ and ‘Sogo (Comprehensive learning)’, which are cross-curricular subjects. The second topic of ‘human rights and social affairs’ focuses on diversified local communities and the subject of ethics. The third topic of ‘international understanding’ is developed through foreign language studies, Japanese language, music and
social studies. The school also has online exchange activities with a primary school in Australia. The fourth topic, ‘disaster prevention’, is developed as practical learning about what to do when disaster strikes through social studies, science and class activities. The important point is that these learning activities are interconnected within the six-year elementary school curriculum, in order to achieve the school’s goals of ‘promotion of independent and personalised learning’ and ‘promotion of activities that recognise diverse individuality’.

This case offers some recommendations for ESD practice through activities to discover and preserve the beauty of diverse and rich local cultures, as in most Southeast Asian countries.

**#2: Creation of diverse learning in a cross-curricular manner**

The Kyoto Municipal Shimogyo Junior High School is developing educational activities in line with its goal of ‘valuing the human spirit and fostering leaders of a sustainable society through diverse learning’ by attaching importance to seven abilities: independence, self-expression, creativity, logical thinking, problem solving, collaboration, and perseverance. In order to ensure that the school’s educational goals are not only for teachers and staff, but also for the students themselves, during the 2022 school year the school changed the wording of one of its goals, from ‘to nurture bearers of a sustainable society through diverse learning, valuing the human spirit’ to ‘to become bearers’.

The school’s curriculum is characterised by the three pillars of ‘Art, Science, and Toughness (AST)’ in the three-year junior high school curriculum, positioning an integrated learning subject called AST and working to foster the development of qualities and abilities across subjects from the perspective of ESD. Each subject has its own learning units to be studied, but the school makes it easy for both teachers and students to see how the content of their study is connected to the development of the seven qualities by showing how these units are interconnected in a unit array chart.

Many Asian schools understand the importance of ESD, but in reality the curriculum often prescribes what should be taught, making it difficult to achieve this goal. The example of this school shows us how important it is to link ESD learning with the existing curriculum, while also emphasising the learner’s independence.

**#3: Broad application of ESD activities**

In addition, there are other examples of ESD promotion not only in school education but also in cooperation with UNESCO projects and other organisations. These are: (1) ESD using World Heritage Sites (natural and cultural); (2) ESD using UNESCO eco-parks and geoparks; (3) ESD in collaboration with UNESCO Creative Cities; and (4) ESD in collaboration with SDG Future Cities. ESD effectively utilises various networks and institutional programmes in Japan and abroad. For the future of ESD it will be crucial to effectively utilise a diverse range of networks and institutional programmes to connect domestic and international ESD initiatives and to promote the perspective of ‘Think Globally, Act Locally’.

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Education for Sustainable Development (ESD) has been emerging as an essential approach for the global society to promote sustainable development since the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. This initiative was further addressed in the Rio+10 conference in Johannesburg in 2002, and it led to the launch of the UN Decade of Education for Sustainable Development (DESDE) between 2005 and 2014. The follow-up programme of the DESDE, the Global Action Programme (GAP) for Education for Sustainable Development, was adopted by the UNESCO World Conference held in Aichi-Nagoya City in 2014 (UNESCO, 2014). With the approval of the SDGs by the UN Summit in 2015, ESD became one of the targets of Sustainable Development Goal 4. In 2019 the UN General Assembly adopted a resolution to scale up ESD in the 2030 Agenda for Sustainable Development.

Although this global campaign promoting ESD has achieved significant progress in recent years, there is still a big difference in the progress of ESD between countries in different development stages. When it comes to considering initiatives for promoting ESD in different countries, is there a unified model, or a common but universally effective approach? In this piece, by reviewing and comparing policies and practices promoting ESD between Japan and China, I argue that it is necessary to integrate policies and practices for promoting ESD within diverse socio-economic contexts between countries in different development stages. In the following paragraphs I will share my reflections on the experience of promoting ESD in Japan and China, as well as their implications for the ASEAN community.

ESD in Japan

Japan, as one of the developed countries, made a strong commitment to ESD and has been taking the initiative to promote ESD since the beginning of the global campaign. Institutional cooperation has been one of the features of Japan’s initiatives during the DESDE. The DESD was promoted by an inter-ministerial meeting consisting of more than ten government agencies (Watanabe, 2015). Moreover, the integration of ESD into relevant policies and laws provides a legal backbone for promoting ESD. ESD was integrated into the Basic Plan for the Promotion of Education formulated by the government in 2008, and it was continuously emphasised in the revisions to this plan published in subsequent years. Since 2008 the concept of ESD has been addressed in the Course of Study for primary and secondary schools, in order to promote it across subject teaching and learning and encourage the sustainable development of Japanese society. The government also provided capacity-building for schools and educators by delivering training and experts to support ESD practices. In addition, the government promoted ESD through an increasing number of schools becoming affiliated to UNESCO’s Associated Schools Project Network (ASPNet). By March 2023 there were 1,115 schools in Japan which had been included in the network, within which schools are encouraged to share good practice and provide training for teachers and principals from other schools within the network. The government also developed A Guideline on Promoting ESD in 2016, in order to guarantee the quality of ESD in these schools. In addition, an interuniversity network supporting the ASPNet schools was established to support these schools to improve the quality of their ESD (Bedford, 2022; Didham & Ofei-Manu, 2012).

Although ESD has been widely promoted in Japan, it is difficult to conclude whether these activities have generated a comprehensive transformation towards a sustainable society. Indeed, despite the expansion of ESD in school education, research shows there is still a lack of interdisciplinary, holistic and whole institutional...
In contrast to Japan, China’s initiative for promoting ESD is more driven by domestic interests. Similar to Japan, China also placed environmental education as a core component of ESD and developed two environmental education programmes in the 1990s (the Environmental Educator’s Initiative (EED) and Education for Environment, Population, and Sustainable Development (EPP)) as part of their initiative for promoting ESD. Although ESD in China has been closely integrated into policy discourses, such as The Scientific Outlook of Development and Ecological Civilization, the scope of ESD in China is still limited to environmental and economic perspectives rather than also including social and cultural aspects (Zhou & Lee, 2022). Moreover, although ESD and sustainable development have been utilised in some official policies in China, there are limited interpretations, explanations and action plans in place for the implementation of ESD initiatives (Zhou, 2020). Furthermore, there is no inter-ministerial cooperation for promoting ESD in China, in contrast to Japan.

Similar to Japan’s ASPNet schools, China also established ESD pilot schools to implement ESD and provide teacher training. However, research has already shown inadequate teacher training, as well as limited and inconsistent government and social support for ESD in local contexts (Han, 2015). In addition, a literature review shows that the limited interdisciplinary approach to teaching sustainability became a barrier for teachers to fully develop and implement ESD. More importantly, the exam-driven education system in China is also seen as systemic barrier for students and schools, who may be unwilling to fully engage in promoting ESD if that means reducing their attention to college entrance exams.

**Implications for the ASEAN Community**

The above comparison of ESD in Japan and China indicates that policy relevant to ESD should be contextualised into specific social contexts, and should be comprehensively formulated by multiple stakeholders according to an interdisciplinary approach. Moreover, the comparative analysis also offers policy makers and practitioners in the ASEAN region a reference to address the demand for improving their own ESD. To do this, first it is necessary to better understand the principle of “the shared but distinguished responsibilities” for countries in different development stages to take action to build ESD. More importantly, it is also necessary for ASEAN countries to interpret the shared responsibility for promoting ESD in their local discourse, and to contextualise their ESD. Finally, ASEAN countries must collectively promote ESD through multiple stakeholders and an interdisciplinary approach.

In summary, by taking a comparative lens this review sheds light on the differences in ESD between two countries at different development stages and with differing political and socio-economic contexts. As there are diverse contexts among the ASEAN countries, it is important to identify “the shared but distinguished responsibilities”, encourage collective partnership, and explore innovative and interdisciplinary approaches for promoting ESD towards 2030 and beyond.

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Sustainable development (SD) refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In 1987 the United Nations (UN) formally recognised SD as a critical agenda, and called for world leaders to respond based on principles of science and research. World leaders signed the UN Millennium Declaration in September 2000, expressing their commitment to resolve eight challenges affecting global citizens through the UN Millennium Development Goals (MDGs). In September 2015 this commitment was renewed through the adoption of the UN 2030 Agenda for SD. The eight challenges set out in the MDGs were refined and presented in the form of the UN Sustainable Development Goals (SDGs), with 17 global goals set for implementation ranging from no poverty (SDG 1) to partnership for success (SDG 17).

Awareness of and interest in SD will continue to increase in the coming years. Individuals are ever more conscious of the effects of their lifestyle and consumption habits on the environment, and many are making gradual changes to their purchases and practices at home and work. Businesses incorporate SD in their strategy and operations through the concept of environmental, social and corporate governance (ESG). At the national level, policymakers and community leaders face challenges related to population growth, increased inequality and economic development, among other things. While additional funds and subsidies can resolve some of these challenges in the short to medium term, these cannot be a sustainable solution for countries and communities in the long term.

How should we – individual educators and administrators who are actively involved in nurturing the next generation of leaders and community members – contribute to the global SD agenda? In this piece we offer three perspectives for deliberation, based on the findings of an interregional study on SD involving 42 member countries of the Asia Europe Meeting (ASEM).

#1: Break it down
As an overarching global agenda, SD can be a formidable topic to tackle head-on. Even our respondents, who were institutional representatives (n=240) from universities across Asia and Europe, perceived themselves to have varied understanding of the subject, ranging from “basic to intermediate” levels for respondents in Asia to “intermediate to expert” levels for respondents in Europe.

We can start by breaking SD into small, bite-sized and manageable subtopics. Generally, concepts and understandings related to SD can vary depending on the regional and local contexts, but they are commonly framed through social, economic, environmental and cultural dimensions. In addition, our study showed some variation regarding which of the SDGs are prioritised in certain countries and institutions compared to others.

SD can also be discussed through an integrative 5P (people, planet, prosperity, peace, partnership) lens. Here, there are at least five aspects to discuss in relation to SD: the UN 2030 Agenda for SD, the UN SDGs, Education for Sustainable Development (ESD), global citizenship education, and climate change education.

Many organisations and educational institutions offer online resources related to SD through open access initiatives, which are readily accessible without paid subscriptions. By identifying suitable resources that are aligned with course or subject requirements, subtopics can then be incorporated into course syllabi, teaching materials, and/or assessment items.
An awareness of SD should be accompanied by the ability and opportunity for students and staff to translate SD into actionable steps that can be taken at the local level.

#2: Make it relevant
An awareness of SD should be accompanied by the ability and opportunity for students and staff to translate SD into actionable steps that can be taken at the local level.

From our study, we found five SDGs that were widely in focus for SD implementation among respondents representing universities. These included: SDG 3 (good health and well-being), SDG 4 (quality education), SDG 5 (gender equality), SDG 10 (reduced inequality), and SDG 13 (climate action). The respondents engaged with the SDGs through learning activities, training programmes, research projects and community outreach projects, among other things.

Among the five SDGs, SDG 4 was the most widely engaged goal under the UN 2030 Agenda. This finding shows that our respondents employed a selective approach in engaging with SD, preferring to focus on goals that are relevant for their institutions and communities. Future policy dialogues should further enhance the alignment between these institutional priorities and the strategies set by governments and policymakers. In this way, the global SD agenda may be scaled down and made relatable to students and staff, as well as being suitably supported by the right policies and resources. The SDGs will be more consistently achieved in areas where they align closely with identified needs.

#3: Empower people
SD should be a whole-institution affair. This means that everyone has a role in implementing SD across all functions, including teaching and learning, school/campus operations, research, professional practice, and community engagement, among others.

While institutional leadership is responsible for setting strategies and initiatives in SD, the findings indicated that students and staff are the main actors driving SD implementation. They work with various stakeholders, particularly public agencies, private companies and industries, non-governmental organisations (NGOs), schools, peers from other universities, as well as national and international networks on SD. To support them in this, they particularly need four distinct types of support: (1) funding for SD initiatives, (2) training on SD, (3) leadership commitment towards the SD initiatives implemented, and (4) engaging initiatives and collaboration opportunities. This finding implies that sufficient incentives and institutional support can motivate students and staff to be more committed towards SD, subsequently driving SD through a bottom-up approach.

Leaders should recognise that student and staff participation is important in communicating institutional leadership commitment towards SD. They can support their communities by providing advisory and support services to those who need them. They should also recognise successful projects and initiatives that are conducted by staff and, importantly, by students. When disseminating our findings, several stakeholders raised the importance of considering the voice of young people in achieving SD, and highlighted that young people should be involved in implementing SD-related initiatives.

SD should also become a core competency in professional development. Students and staff should be encouraged to attend specific training sessions on different aspects of SD to increase their understanding of the subject. Our study found that lack of knowledge and expertise related to the SDGs is still identified as a significant barrier to their achievement, particularly in Asia-based HEIs.

Online learning through various social platforms should also be leveraged to bridge the knowledge gap related to SD. For staff, sharing of pedagogical approaches and best practices related to integrating SD within the curriculum should also be encouraged through forums and knowledge-sharing events, both online and offline. These will align with policymakers’ prioritisation of the ‘education mission’ of universities as the top area in which they aim to incentivise SDG activity.

Conclusion
Critical mindset and behavioural changes towards sustainability start at the individual level, and they must start early. Our students should acknowledge that SD is not a fleeting trend, but a way of life that will ensure prosperity and well-being for themselves, their loved ones and the world. We should help them to engage with SD by providing both knowledge and opportunities for action. More importantly, everyone should help students to recognise sustainability as a virtue in their way of thinking about the world and as a guiding principle for their thoughts and actions in their everyday lives, grounded in what matters most to the communities where they are located.

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The emerging role of artificial intelligence in education

The advent of generative artificial intelligence (AI) tools, such as ChatGPT, is fast disrupting the landscape of education. A growing number of students are adopting these AI tools in their learning. They are discovering that AI can be so much better at teaching, with a degree of patience that is beyond human. Educators are also struggling to keep up with this new reality as they discover how traditional modes of teaching and assessment can easily be replicated and answered by such tools. Every advance in generative AI technology is proving that it is becoming impossible to design AI-resistant assessments.

Such unsettling realisations have led many educators to respond with apprehension. Is the teaching profession at existential risk? How can we preserve academic integrity in student learning? Will we see the rise of a generation reliant on AI tools as a digital crutch? These and similar concerns have led to calls in some places for the outright banning of AI tools, while others have resorted to reinstating closed-book final examinations in place of continuous assessments.

Despite these concerns, however, it is critical for higher education to stay relevant by equipping our students with the necessary skills to navigate the complexities and uncertainties that lie ahead.

As educators, we must embrace the potential of artificial intelligence (AI) in teaching and learning, leading our students by example in the responsible and effective use of these tools. Only then will we be equipped to brave the frontiers of this uncharted and evolving educational landscape.

Bridging the disruption of trust

Since the public release of ChatGPT in November 2022, a narrative of suspicion has overshadowed discussions about AI in education, fuelled by instances of cheating and widespread misunderstandings about how students are using AI for legitimate learning purposes. Unfortunately, this has produced an atmosphere of mistrust between students and their educators.

Embracing ChatGPT and other generative AI tools in higher education: The importance of fostering trust and responsible use in teaching and learning

JONATHAN Y. H. SIM
Trust is the foundation for learning, and we must not allow ignorance of this new technology to disrupt the relationship between students and educators.

As we navigate the ethical dilemmas that arise from relying on AI tools, we need to recognize that students will face similar challenges when using these tools. By familiarizing ourselves with the ethical implications of AI in our own work, we can develop empathy and a nuanced understanding in order to better recognize that not all students who use AI for their assignments do so with the intent to cheat.

Moreover, AI detection tools are far from perfect. I can attest that my own original works and the original works of colleagues and students are occasionally flagged as containing “parts written by an AI”. What students fear most is that they might be falsely accused of cheating, as the result of a false positive by such detection tools. In these circumstances there is no clear way to prove their innocence. Trust between the student and educator is jeopardised in such circumstances.

Recovering trust while embracing AI in learning

In the face of such circumstances, there are two things that we can do to preserve trust between students and educators.

First, we should create a safe space for students to explore and use these technologies responsibly, by allowing students to use AI-generated content in their work with proper attribution and citations (as they would with any other cited material). This will empower them to be more transparent and open about their usage of AI tools in learning without fear of penalty.

Second, we should shift the focus of assessments away from evaluating student performance. This creates an unhealthy competition for grades, and incentivises students to cheat. Instead, we should focus on designing formative assessments that are intended to help students learn deeply as they do the work.

For starters, we can encourage collaborations between students and their educators through self-directed research projects. By requiring students to
formulate their own research questions, there is no ready question that students can simply feed into an AI tool to obtain answers. They will need to deepen their own understanding before they can formulate a question. This encourages students to pick topics of interest, which will motivate them to use AI tools more as a supplement to their knowledge than as a shortcut.

Further, since research is a collaborative process, students can gain feedback and affirmation from their educators, while educators can gain fresh insights that may be beneficial to their own work. Ultimately, students and educators will be more as a supplement to their knowledge than as a question. This encourages students to pick topics of interest, which will motivate them to use AI tools a question. This encourages students to pick topics of interest, which will motivate them to use AI tools.

We can direct the AI to adopt the role of a “tutor,” providing evaluative feedback on students’ drafts, or it can function as a fellow “student,” enabling learners to discuss new subjects or hone certain soft skills through conversations and debate. AI can also be instructed to engage in Socratic dialogue, with either the AI or the student taking on the role of the Socratic questioner. With ChatGPT and other prompt-based AI tools, we can direct the AI to adopt any role to productively interact with students.

Integrating AI tools into learning activities
What if we wish to integrate AI tools into our learning activities? Again, there are two categories of activities we can explore.

The first category is to treat AI as a learning partner. The AI tool can assume the role of a “tutor”, providing evaluative feedback on students’ drafts, or it can function as a fellow “student”, enabling learners to discuss new subjects or hone certain soft skills through conversations and debate. AI can also be instructed to engage in Socratic dialogue, with either the AI or the student taking on the role of the Socratic questioner. With ChatGPT and other prompt-based AI tools, we can direct the AI to adopt any role to productively interact with students.

The second category involves guiding students to identify the limitations of AI tools and find areas where human intervention can add value to AI-generated output. To achieve this, we must teach them how to develop better instructions (or prompts) to command the AI, and subsequently how to critically question and evaluate the output. This will enable students to identify flaws and limitations in AI-generated content, and to discover their own niche areas where they can add value to the AI’s work, ultimately surpassing the AI’s capabilities.

This approach parallels the way in which design schools teach Photoshop, not as an end in itself but rather as a means to cultivate a discerning eye for excellent design. Although we may use tools like ChatGPT for now, the idea still holds true for the future, since we are teaching students how to employ AI tools to develop a critical eye for exceptional AI-generated content – a soft skill that will be transferable to other AI tools in the future.

I recently designed a tutorial activity for a diverse cohort of 400 humanities and social sciences students. The activity tasked students with designing the best prompt to instruct ChatGPT to generate a presentation pitch. Once they were satisfied with the output, they were challenged to critique and refine the pitch to identify the features of a compelling presentation.

The lesson was a resounding success. Students learnt that the process of refining prompts and outputs requires an artful combination of questioning and evaluative skills, as well as expressive and articulate communication. Students who excelled in these soft skills outperformed their peers.

To demonstrate the effectiveness of this activity, I would like to share an incident. A group of four students struggled to design better prompts, while a fifth member – a literature major – found that her literary training had equipped her well to precisely articulate her needs and produce sophisticated outputs. By the end of the class this student had a newfound confidence in her literary abilities to prepare her for the future of work with AI.

Braving the frontiers
Generative AI tools have begun to disrupt the traditional dynamics in higher education. As educators, it is our responsibility to adapt and embrace AI’s potential to enhance teaching and learning. Embracing AI in education should not be seen as a threat. Instead, it should be perceived as a timely opportunity to reinvigorate education. We can create a more dynamic, collaborative and engaging learning environment that fosters trust and understanding, and challenge students to cultivate their intellectual curiosity to go further than an AI tool.

We must lead our students by our example as we brave the frontiers of this uncharted and evolving educational landscape into the future.

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Embracing the challenge: Navigating the use of AI in education

KRITSACHAI SOMSAMAAN

Imagine a society where every individual is an executive equipped with a team of efficient and responsive personal assistants. With the help of artificial intelligence (AI) tools such as ChatGPT and Midjourney, these assistants can produce exceptional visuals, write professional letters, and even create original songs and graphics in any style. While this may seem like a far-fetched idea, advances in AI technology have brought us closer to making this vision a reality. However, ensuring that everyone possesses a thorough knowledge of how to use these tools to achieve their goals will be crucial. This will require a fundamental shift in how we educate our children to prepare them for the new working paradigm.

Artificial intelligence has far-reaching applications beyond the tasks mentioned above. In the field of education, AI has the potential to revolutionise how we learn and develop our talents. Many companies are currently working on AI solutions that can customise learning materials to meet individual needs, provide learning approaches that match individual learning styles, and adapt to different backgrounds and current levels of development. These personalised learning systems aim to make learning more effective and efficient, ultimately transforming education as we know it.

The education sector has access to a wide range of AI tools that aid with administrative tasks, enhance student engagement and achievement, monitor student progress, and analyse learning disabilities to provide targeted solutions. This article will focus solely on the use of generative AI tools, particularly ChatGPT from OpenAI, in education.

General guidance
After ChatGPT’s release for general usage in November 2022, the education community has shown immense enthusiasm about its potential to revolutionise the learning process and disrupt the status quo in education. However, the question of whether to allow its usage in lessons, student homework and assignments has sparked heated discussions. While proponents fully support its use, they also warn about the potential for abuse by students. Educators are being presented with a variety of guidelines and arguments on how to adopt ChatGPT in the learning process, which revolve around three crucial principles:

1. Prepare students to work alongside machines, not to work like machines.
2. Don’t trust everything it says. Progressively question its answers and explore deeper.
3. Learn how it works and understand its limitations.

Key Principles for Adopting ChatGPT in Learning
The zereth principle is to prepare students to work alongside machines, rather than like machines. This principle is labeled the "zeros" because without it the rest of the principles would be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless. The main idea is that we already have access to a powerful tool, instead of competing with it, the tool can be useless.

The *first principle* is not to trust everything ChatGPT says. ChatGPT is based on a generative AI algorithm that can create seemingly new and realistic content. However, the underlying engine uses statistical models to generate new data from a training dataset. According to the garbage-in, garbage-out principle, the output produced by ChatGPT depends on the data it was trained with. Obviously, it is crucial to verify the accuracy and reliability of the information generated by ChatGPT before accepting it as valid.

During my personal use of ChatGPT, I asked it to provide me with a chord progression for the famous song *Fly Me to the Moon*. It generated a set of chords that appeared to be appropriate and matched it closely. I knew that this set of chord progressions was wrong without even trying them on a musical instrument. Interestingly, in addition to the chords and lyrics the answer also included a paragraph of information about the song’s composer and how it was composed. Nevertheless, although the presentation style of ChatGPT’s answer was convincing, the answer to the main question was entirely incorrect.

One positive aspect of ChatGPT is that its knowledge keeps evolving with the information provided by users. When I asked the same question again a month later, ChatGPT was able to produce the correct answer. Furthermore, I was able to request a customised chord progression for a different music genre. I specified that I wanted a jazz flavour, and ChatGPT generated a chord progression with various chord tones that matched different jazz styles.

The previous example highlights the importance of the *second principle* – learning how ChatGPT works and understanding its limitations. Whenever a tool is used, it is crucial to have a basic understanding of how it functions. While one doesn’t need to learn coding and create one’s own generative AI, a general understanding of how the technology operates can help in identifying what input is needed and what output should be expected.

It is important to understand ChatGPT’s limitations. Its responses are based on the data set it was trained on, which means that it may not provide a valid response to a new or unfamiliar topic. In such cases, it may provide an answer that seems believable but is not accurate. For instance, when asked about Industry 5.0, ChatGPT responded with a set of well-crafted and seemingly knowledgeable answers that were all about Industry 4.0, without realising that we were still in Industry 4.0. Therefore, it is essential to understand the tool’s limitations in order to know what to expect from it.

By keeping these three principles in mind, ChatGPT can be an invaluable tool in various fields, particularly in education.

The future of AI in education

While ChatGPT has tremendous capability to transform education and the way we develop our skills, one fundamental issue remains – that of the equity and equality of education. There are those who have access to the tool, and those who do not. The digital divide we have already experienced will only become more pronounced with the looming problem of the AI divide. Although the GPT engine was created by a group of open-source supporters, its engine can be used to build more advanced commercial products. In addition to the free version that is available for anyone to use, ChatGPT also has a more powerful fee-based version, whereby those who can afford to pay the subscription fee will have access to better services than those who cannot.

Governments, universities and schools must take this problem into consideration and set up policies or support to narrow this divide. ChatGPT is not only an application that uses generative AI as its engine; other applications are available that have been customised to fit specific tasks and flavours. One of the most interesting features of AI applications is their ability to link and integrate with other applications. ChatGPT has been linked to a flight booking engine, so that it can access real-time information on available flights. Other information sources have also been planned to link with ChatGPT to allow users to query information via the ChatGPT interface. Users will be able to conduct business, do online shopping and perform other tasks using a conversation style similar to talking with actual people instead of interacting with website interfaces.

In the realm of education too, the GPT engine has immense capabilities when used with existing and widely-used applications. For instance, Khan Academy has implemented its *Khanmigo* by embedding the newest GPT engine into Khan Academy’s tutorial tools. The AI-enabled Khan tutoring system can interact with its learners like a live tutor. The AI can help to guide students according to misunderstandings that the AI can detect, and can work out the details until the student has a clear understanding of the subject.

The age of artificial intelligence is here now, and technologies are becoming more powerful every day. They promise to have a vast and increasing impact on our daily lives. What we need to do is to learn how to make use of such technologies effectively and efficiently. This means we will need to rethink the process we use to develop human capabilities and skills.

AI may not be able to replace human beings entirely, but it has demonstrated that there are many things that it can do better than human beings. The education world has been discussing lifelong learning recently to help people remain relevant in the context of all the forthcoming changes in the VUCA world. A key issue that we will need to explore in research and policy-making is that we can live creatively alongside powerful intelligent machines.

A key issue that we will need to explore in research and policy-making is ensuring that we can live creatively alongside powerful intelligent machines.

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**DR KRITSACHAI SOMSAMAN** is Centre Director, SEAMEO Regional Centre for STEM Education.
We should think of ChatGPT as another person, rather than just a machine – a chat engine, capable of continuous conversation. Essentially, ChatGPT can be seen as a person that we can interact with and ask for help in specific areas. This pull-out provides useful guidance and prompts to help users make the most of the tool.

**For students:**

**Do’s and Don’ts**

**As a Learning Partner**

**Why?**

ChatGPT:
- Excels at continuous conversation
- Remembers the content of a conversation from the start, making repetition of information unnecessary
- Keeps records of multiple conversations so they can be returned to later

Students can:
- Use ChatGPT for brainstorming
- Test new ideas and get them assessed by ChatGPT

**As a Tutor**

**Why?**

ChatGPT:
- Is able to explain difficult subjects in simple, understandable language
- Is able to provide guidance before writing an article

Students can:
- Use ChatGPT to summarise a paper from the text of the article
- Use other generative AI tools, such as ChatPDF which allows users to ask specific questions about the content in a particular PDF file
- Ask ChatGPT to provide an outline of the topics that should be discussed
- Engage in an ongoing conversation to adjust their paper to suit the concept they want to write about

**As a Reviewer**

**Why?**

ChatGPT:
- Excels at giving constructive feedback
- Can summarise the final article to see whether it really conveys the ideas that the authors intended
- Can help to proofread for grammatical errors and suggest different writing styles

Students can:
- Use ChatGPT to review their writing and see if any improvements are needed

**Ways to use ChatGPT for students**

For educational purposes, ChatGPT can perform the three functions listed below.

**ChatGPT vs ChatPDF?**

ChatGPT will answer the user’s questions by applying additional knowledge learned from its trained dataset. ChatGPT will provide specific answers based on a particular paper, and can identify exact locations in the text related to the user’s questions.

The quality of ChatGPT’s output depends critically on the prompt and the data provided to it. With the right setup, ChatGPT can generate impressive outputs that require little to no further editing. However, it is important to remember that although ChatGPT can write entire essays or video scripts on its own, it is not recommended to rely solely on the AI-generated content without understanding the material. This aligns with the first principle discussed in our article (p. 50).
Innovate assessment formats

Why?
Having AI in the classroom can:
• Help students find answers to typical exam questions, making it hard to evaluate their true capabilities

Teachers may need to:
• Consider the use of oral tests, to examine students’ understanding of the subject matter, their creativity and other skills
• Be aware of the need to change assessment approaches to evaluate the capacity and necessary skills of students in the AI-enhanced world

Don’ts for students using ChatGPT

Don’t expect AI tools to do all the work without putting in any effort
Don’t blindly trust AI-generated information
Don’t do anything that violates your school’s academic integrity policy

Why?
ChatGPT:
• Works best as a conversation partner with suitable questions or prompts
Students should:
• Put effort into designing suitable prompts
• Keep interacting with ChatGPT to dig deeper into issues or explore its answers further, to learn more about the area

Why?
ChatGPT may give output that is:
• Non-existent – many users have reported that the references provided by ChatGPT did not actually exist
• The result of a connection of relevant topics and names to produce new information, rather than by referring to existing articles
• Completely wrong, especially in relation to non-famous individuals without publicly available data
Students should:
• Check the output thoroughly for validity
• Do further research to check whether the output is actually valid, and whether there are real references to substantive background information

The effective adoption of ChatGPT:
• Requires a deeper understanding of the tool by the education world
• Requires changes to current regulations and rules

Students should:
• Follow their institution’s rules and regulations based on the school’s principles and ideologies
• Not abuse ChatGPT and other AI tools without also engaging in learning and capability development

Why?
Teaching methods using AI are commensurate with alternative teaching concepts and learning principles such as:
• Flipped classrooms
• Active learning
• Problem-based learning
• The constructivist approach

Teachers can:
• Ask students to undertake self-study with the support of AI before coming to the classroom to explore hands-on applications of the subject in real-world situations
• Support students to develop necessary skills, in conjunction with Knowledge students have previously learned from AI
• Create interactive classrooms that exist side by side with AI, rather than being replaced by it

Revise teaching methods to involve the use of AI

Why?
ChatGPT:
• Is easy to use and provides ready-made answers
• Makes it easy for students to use AI-generated answers wholesale in their assignments

Teachers need to:
• Implement guidelines for avoiding plagiarism and copyright infringements
• Help students to recognise the importance of such issues

Why?
It is important for teachers to:
• Monitor the progress of students’ skill development with AI tools

Teachers can:
• Serve as consultants, guiding students in the appropriate and effective use of these powerful tools for learning

Implied for Teachers: Redesigning Teaching

As teachers we should teach alongside machines, not work like them. The role of teachers needs to change, from delivering content to helping students to develop their capabilities and skills with the support of advanced AI tools. Here are some implications for teachers in terms of their future responsibilities.

Implement guidelines for avoiding plagiarism and copyright infringements

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Why?
Revise teaching methods to involve the use of AI

“*This is according to the first principle of dealing with ChatGPT or any other AI tools*”
Besides HESB, The HEAD Foundation’s other educational initiatives include capacity-building programmes for school leaders and educators, the Making HEADway suite of educational offerings for teacher professional development, and a partnership with education technology company Enuma.

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Capacity-building programmes

Leadership Development Programmes – Higher Education Institutes (LDP-HEIs) in the Philippines, 2022

▶ Our fifth Leadership Development Programme for Higher Education Institutions, organised in partnership with SEARCA and held in the Philippines.

Cambodia Future Oriented STEM (CFOS), 2022

▶ Our first foray into designing STEM learning in Cambodia through the CFOS programme, aimed at supporting curriculum development and 21st century competency acquisition for students.
Asian Development Bank - The HEAD Foundation (ADB-THF) Professional Development Programme, 2022

▶ A gathering of educational leaders from the region for a time of learning and exchange of ideas, during the ADB-THF Professional Development Programme 2022 held in Singapore.

Cambodia STEM Mentoring, 2023

▶ Building on CFOS, The HEAD Foundation convened a STEM Roundtable with our partners in Cambodia and the region to exchange ideas and explore programmes to deepen STEM teaching and learning in Cambodia.

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