Six Principles to Advance Technical and Vocational Education for Sustainable Development

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1. INTRODUCTION

The term *sustainability* was first coined by a German forester, Hans Carl von Carlowitz, who in the early 18th century discussed "sustainable use" of the forest, faced with the disastrous consequences of timber shortages on Saxony's silver mining and metallurgy industries. It is highly significant that von Carlowitz's discussion of the term focused already on both natural (forest) and economic elements. Environmental and economic components continue to be at the core of discussions around sustainability today, but consideration to its social component has been added. These three elements are incorporated into the concept of the "triple bottom line" that sustainable organisations, Elkington proposes, should consider in their decisions, instead of focussing only on profit[1].

While the intellectual history of sustainability can therefore be traced far back, the term *sustainability* (an objective) and *sustainable development* (the means to achieve that objective) did not achieve wide currency until the second half of the 20th century, in the context of public debates about unsustainable patterns of production and consumption, limits to economic growth and the emergence of strong environmental movements. "Our Common Future", an influential World Commission on Environment and Development report also known as the "Brundtland report" – after the commission's chair, former prime minister of Norway Gro Brundtland – defined sustainable development as: "development that meets the needs of the

1. Elkington, John. 1999. Triple bottom line revolution: reporting for the third millennium. Australian CPA, vol. 69, pp. 75-77; Elkington, John. 2018. 25 years ago I coined the phrase "triple bottom line." Here's why it's time to rethink it. Harvard Business Review, 25, pp. 2-5.

present without compromising the ability of future generations to meet their own needs"[2].

The concept of sustainability is very widely used today[3]. The Sustainable Development Goals (SDGs[4]), which attempt to coordinate countries' response to pressing common challenges, played no small role in placing sustainability high in the political and public agenda. Education has a key role in facilitating sustainable economic, environmental and social development, and has a supportive role in the achievement of various SDGs by empowering society to take informed and responsible decisions. There is, in addition, a specific goal (SDG4) related to education, which makes reference to vocational education and training (VET). This contrasts with the almost total absence of VET in earlier international agendas like the Millennium Development Goals and Education for All[5].

The SDGs were approved in 2015, and while some progress has been achieved in relation to SDG4, the challenges faced by sustainability in education are as great as ever. In particular, since the approval of the SDGs the resilience of education systems has been put to the test during the COVID-19 pandemic and as a result of growing geo-political tensions. The emergency situation brought about by the pandemic presented tremendous challenges for education across the globe. These included widespread school closures, which affected learning and increased educational inequalities, and increasing strains on public finances as a result of emergency economic support packages that were mobilised in many countries. Today, renewed geopolitical instability, most visible in the war in Ukraine, presents a new set of challenges related to access to energy (oil and gas). This has increased the demand for greener energy sources, and VET has an important role to play in confronting this challenge, by providing the necessary skills to implement change. This is just one example in which sustainable development needs a labour force with the technical and vocational skills for a green transition. Challenges also extend to the integration of refugees, where the provision of education and training has a central role. Against this backdrop, it is important to reflect on sustainable development's role, practice and approaches in VET.

2. World Commission on environment and Development. 1987. Our Common Future: Report of the World Commission on Environment and Development. Oxford: Oxford University Press, p. 43.

3. Scones, Ian. 2007. Sustainability, Development in Practice 17:4-5, 589-596.

4. There are 17 SDG and over 150 associated targets.

5. See McGrath, Simon, Alla-Mensah, Joyceline and Langthaler, Margarita. 2018. Skills for decent work, life and sustainable development: Vocational education and the sustainable development goals. Austrian Foundation for Development Research.

2. SUSTAINABLE DEVELOPMENT IN VOCATIONAL EDUCATION AND TRAINING

It is not easy to know where we are and what progress we have made with regard to sustainable development in education. The SDGs provide a valuable attempt to do so, and much data has been compiled to that aim[6]. The 17 SDGs have over 150 associated targets, and progress against the SDGs is provided regularly by the United Nations[7]. There is also notable activity in the selection and dissemination of good practices in their implementation – with almost 200 good practices related to SDG4 approved by the UN in 2020/21[8]. SDG4 refers, specifically, to achieving inclusive and equitable quality education and promoting lifelong learning opportunities for all. The targets associated with SDG4 are numerous, but they could be grouped under the three central elements of participation in education (access and outcomes), quality/relevance and investment. They cover core elements of sustainability in education. But it can also be said that the targets do not cover the three elements of sustainability (environmental, economic and social) equally well. Moreover, the conceptual relation between the various SDG4 targets and the SDG4 objectives is at points tenuous[9]. In any case, it is clear that nations across the world approach sustainability in different ways. There is no single definition or model to "do" sustainability. Below, I reflect on six guiding principles, rather than prescriptions for action, related to curriculum, pedagogy and philosophy that should be given consideration for the achievement of sustainable development in vocational education and training, both initial and continuing, at secondary and higher level.

6. See, for SGD4, (https://tcg.uis.unesco.org/data-resources/ https://tcg.uis.unesco.org/). Checked on 28 August 2022.

7. United Nations. 2022. The Sustainable Development Goals 2022. (https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf). Checked on 28 August 2022.

8. See (https://sdgs.un.org/publications/sdg-good-practices-2nd-edition-2022); (https://sdgs.un.org/events/2022-sdgs-learning-training-and-practice); (https://sdgs.un.org/events/session-9-innovative-tools-target-setting-peer-learning-and-policy-dialogue-sdg-4-and-sdg); (https://sdgs.un.org/partnerships/browse). Checked on 30 August 2022.

9. See McGrath, Simon, Alla-Mensah, Joyceline and Langthaler, Margarita. 2018. Skills for decent work, life and sustainable development: Vocational education and the sustainable development goals. Austrian Foundation for Development Research.

A. Holistic

A holistic approach to VET sustainability requires attention on its environmental, economic and social dimensions. Discussions on sustainability can quickly become dominated by environmental concerns. There is, indeed, a need to make VET "greener" (e.g., consider climate change, use of resources, sustainable urbanisation, etc.) and to further promote the development of environmental sustainability skills in the curriculum. The German Federal Institute for Vocational Education and Training (BIBB) has a long trajectory in promoting valuable VET-related sustainable development pilot projects[10]. However, environmental aspects are not yet generally a priority in VET, like in education more generally. A recent review by UNESCO found that around half of the national curriculum frameworks of the 100 countries it reviewed made no reference to climate change, whereas those who did usually included minimal references only. Inclusion, moreover, was more frequent in those regions that are more vulnerable to the impacts of climate change than in those that have greater responsibility for the emissions related to climate change[11]. While sustainability-related aspects may be included in curricula under other headings the above findings are not promising.

While the environmental dimension is important, it is insufficient. To be sustainable, VET needs to also consider economic rationales and provide skills that are relevant to the labour market – a topic to which I return later. For education systems to be sustainable, learners also must have a diverse set of options to choose from, including high-quality vocational routes that lead to quality employment opportunities. That has traditionally been the situation in countries like Germany or Denmark. But in other countries, like Spain, without a strong VET tradition a significant share of graduates now enhance their employability by undertaking VET programmes after they complete their university studies. The economic rationale is, in fact, the focus on SDGs targets. Environmental and social concerns may be secondary to economic development concerns, in particular in less affluent areas, but not only in those[12].

10. See (https://www.bibb.de/en/33716.php). Accessed on 03 September 2022.

11. UNESCO. 2021. Getting every school climate ready. How countries are integrating climate change in their education. UNESCO, Paris. (https://www.uncclearn.org/wp-content/uploads/library/379591eng.pdf).

12. Pavlova, Margarita. 2008. Technology and vocational education for sustainable development: Empowering individuals for the future. Springer Science & Business Media.

The human and social dimension is less visible in SDG4 and across countries. Yet, social sustainability is essential and inextricably linked to our survival. It recognises that learners not only exist in their relation to employment, but also to others[13], as well as in relation to the environment. Social sustainability is related to the development of certain values and views of the world. Learning about human rights, peace and security, equality, appreciation of diversity and intercultural understanding or global citizenship, sustainable consumption, supply chains, biodiversity, disaster reduction and poverty reduction can be included under the social dimension of sustainability. Collaboration, critical thinking or problem solving, systems thinking and anticipatory competencies have been proposed as part of it too. Sustainable VET should develop and advance a wider set of knowledge, skills and attitudes beyond technical competencies and develop individuals in a holistic way to support them in the achievement of what they want to become. But this is easier said than done. There has been some progress towards enhancing the provision of transferable skills in VET in various countries and also increasing interest in the role of VET in the production of civic outcomes[14]. But there are challenges in relation to these aspects[15], and they fall short of a comprehensive approach to social sustainability in VET.

Latvia's Education Development Guidelines 2021-2027[16] have given a visible place to sustainability as a central objective and incorporate reference to the development of digital transversal competences, including critical thinking, collaboration and civic participation. "Green skills" have entered the VET curricula and sustainability has been associated with transversal skills requirements in the country. There are also government guidelines, and provision of continuous professional develop-

13. Langthaler, Margarita, Simon McGrath, and Presha Ramsarup. 2021. Skills for green and just transitions: Reflecting on the role of vocational education and training for sustainable development. No. 30. ÖFSE Briefing Paper.

14. Mennes, Hester I., Herman G. van de Werfhorst, Anne Bert Dijkstra, and Anke Munniksma. 2022. Are schools' qualification and civic outcomes related? The role of schools' student composition and tracking. Education, Citizenship and Social Justice. Online First; Leeman, Yvonne and Monique Volman. 2021. Citizenship in prevocational education: Professional pride as a source. Education, Citizenship and Social Justice 16(1): 17-30.

15. Gekara, Victor and Snell, Darren. 2018. Designing and delivering skills transferability and employment mobility: The challenges of a market-driven vocational education and training system. Journal of Vocational Education & Training, 70(1), pp. 107-129.

16. (https://eprasmes.lv/wp-content/uploads/2022/02/Latvijas-Izglitibas-attsitibas-pamatnostadnes-2021-2027.pdf). Accessed on 5 September 2022.

ment for teaching staff on greening investment by VET institutions[17]. More broadly, also in Europe, the 2020 "Council of the European Union Recommendation on VET for sustainable competitiveness, social fairness and resilience" calls for VET institutions to embed environmental and social sustainability in their programmes and in their organisational management in line with the UN SDGs[18]. There are also valuable initiatives in Asia. For example, actions on Greening Technical and Vocational Education and Training (TVET) in Viet Nam aimed to build a green culture[19] in TVET institutes[20] – greening campus, curricula and research and technology. Green good practices from TVET institutions in Singapore are being disseminated to other countries (Cambodia, Lao PDR, Myanmar and Viet Nam) under Singapore's initiative for Asean integration[21].

But while discourses around sustainability have gained prominence in VET and initiatives have been put in place in certain countries, generally sustainability – beyond its economic elements – is not yet high in countries' VET implementation agendas, course handbooks and examination regulations[22]. Evidence coming from Asia suggests that this derives, in part, from institutions' belief that demand for green skills from industry is not high enough, lack of accepted standards and certification systems, and insufficient time for the integration of sustainable development in the curriculum. VET staff also require further professional development in this area[23] – a point developed in more detail below.

17. Cedefop. 2021. Latvia: New momentum for green approaches in VET. (https://www.cedefop.europa.eu/en/news/latvia-new-momentum-green-approaches-vet). Checked on 4 July 2022.

18. Council of the European Union. 2020. Council Recommendation of 24th of November 2020 on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience 2020/C 417/01. (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020H1202(01)&from=EN). Checked on 6 July 2022.

19. See also Majumdar, Shyamal. 2011.. Developing a Greening TVET Framework. In: UNESCO-UNEVOC, CSP, GIZ: Transforming TVET for Meeting the Challenges of the Green Economy. Report of the International Consultation Meeting. 27-30 October 2011, Bonn.

20. (https://www.tvet-vietnam.org/greening-tvet ; https://unevoc.unesco.org/pub/greening-vcmi-reform-vietnam.pdf). Checked on 9 September 2022.

21. (https://scp.gov.sg/startpublic/#!/courses/clusters/CLS_8/%23/0/0). Checked on 6 July 2022.

22. See, for an analysis of the German case Holst, Jorrit, Antje Brock, Mandy Singer-Brodowski, and Gerhard de Haan. 2020. Monitoring progress of change: Implementation of Education for Sustainable Development (ESD) within documents of the German education system. Sustainability 12, 10: 4306.

23. Maclean, Rupert, Shanti Jagannathan, and Brajesh Panth. 2018. Education and skills for inclusive growth, green jobs and the greening of economies in Asia: case study summaries of India, Indonesia, Sri Lanka and Viet Nam. Springer Nature.

B. Inclusive

Sustainable VET needs to be inclusive, in terms of access, treatment during the VET experience and achievement. Access measures need to target vulnerable groups, including "persons with disabilities, indigenous peoples and children in vulnerable situations", as noted by SDG4 targets, but also people from lower socio-economic backgrounds, females or learners living in rural areas. Age inclusiveness – which has implications for aspects such as the flexibility of delivery or financing – becomes more relevant as demographic changes (ageing of the population) accelerate in many countries, making inclusiveness not only a moral duty, but also a necessity. Two thirds of the world's population live in a country or area where lifetime fertility is below zero growth levels (2.1 births per woman)[24]. Population growth has declined. In 2023, China, the most populous country in the world, is expected to experience an absolute decline in its population. Automation can contribute to getting things done, but people of all ages are required too.

The VET experience is fundamentally influenced by infrastructure and pedagogies. Infrastructure, in terms of estate (new buildings, existing estate, use of energy resources) and digital, needs to take sustainability into account, as noted by the UK's sustainability strategy for education[25]. In terms of pedagogy, education for sustainable development is often associated with a shift towards task-based instruction, problem orientation, interdisciplinarity and the use of digital tools and approaches to develop competencies for sustainable development and to cater for the needs of a diverse learner population[26] (including through the use of adaptative technologies). Inclusion also needs to be considered in the definition of programme learning outcomes and assessment strategies.

24. United Nations. 2022. World Population Prospects 2022: Summary of Results. (https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2022_wpp_key-messages.pdf). Checked on 4 August 2022.

25. See Department for Education. 2022. Sustainability and climate change: a strategy for the education and children's services systems. (https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy/sustainability-and-climate-change-a-strategy-for-the-education-and-childrens-services-systems#action-area-3-education-estate-and-digital-infrastructure).

26. Lambini, Cosmas Kombat, Angelina Goeschl, Max Wäsch, and Martin Wittau. 2021. Achieving the Sustainable Development Goals through Company Staff Vocational Training—The Case of the Federal Institute for Vocational Education and Training (BIBB) INEBB Project. Education Sciences 11(4): 179.

C. Responsive: Individual, Economy, Community and Environment

To be sustainable VET needs to be of high quality, agile and responsive. It needs to respond to learners' goals and needs, accommodating different ways of learning, letting learners explore and apply according to their interests. It also needs to be responsive to the economy, by developing skills that can be deployed in the labour market and lead to decent jobs – the Singaporean SkillsFutures[27] initiative has rolled out a set of initiatives to this aim. While much of the literature on the future of work paints a rather bleak picture of the prospects of the middle of the labour market, shortages persist in various intermediate skilled positions. VET has traditionally catered for this segment of the labour market. Clearly VET continues to be relevant. But there is a far-from-perfect field match between the VET programmes learners undertake and their later occupations in the labour market. Moreover, labour market trajectories have become increasingly fluid. Being responsive, in this context, may mean, increasingly, to prepare learners for further learning and for a group of related occupations rather than more narrowly for a single occupation. It additionally may mean preparing for entrepreneurship, in the traditional sense, as well as for self-employment and periods of gig work.

There are various recent trends in Europe that attempt to make VET more responsive to economic needs. They include strengthening the involvement of industry in curriculum design (see for example the T-level initiative in the UK), the revitalisation of apprenticeships and attempts to expand the skills developed in VET to better include transversal skills – as noted earlier. Modularisation, micro-credentials and alternative credentials – sometimes sitting within national qualification systems and other times outside them – all aim to make skills development systems more agile and responsive, at a time when the task structure of jobs can change rapidly[28]. But VET also has an important role in contributing to the development of local communities and meeting their needs and this should not be forgotten.

27. (https://www.skillsfuture.gov.sg/). Checked on 5 July 2022.

28. Brown, P., Lloyd, C. and Souto-Otero, M. 2018. The prospects for skills and employment in an age of digital disruption: a cautionary note. SKOPE Research Paper, 127(127); Bisello, Martina, Eleonora Peruffo, Enrique Fernández-Macías, and Riccardo Rinaldi. 2019. How computerisation is transforming jobs: Evidence from the Eurofound's European Working Conditions Survey (No. 2019/02). JRC working papers series on Labour, Education and Technology.

D. Permeability

Education frequently operates in silos. Secondary education VET routes were often a terminal route that did not give access to higher education. Today, progress has been made in enhancing the permeability of systems, connecting secondary VET with higher education levels. The breaking down of silos within formal education can also be related to the breaking down of barriers impeding interdisciplinary projects on sustainable development. But by permeability in VET I refer also to the permeability between formal learning, the learning that takes place within formal education institutions, and learning that takes place outside them: non-formal learning[29]. VET has traditionally had strong connections with the world of work, in particular in dual systems that combine learning in educational institutions and on the job – which are important components of the German and Austrian VET system, and emerging components in other European countries like Spain. But much can still be done in terms of connecting the learning that takes place within formal education institutions and outside. The German 2017 National Action Plan on Education for Sustainable Development[30] noted that "additional potential for ESD is to be identified in TVET by integrating formal vocational education and training with informal/experience-based education/occupational experience. Innovations from operational practice are to be incorporated more rapidly into TVET". Estonia is among the European countries wherein the integration of formal and non-formal learning has become a policy priority. Current experiences encompass completing electives outside of formal education, compulsory "independent creative study projects" outside of school, and completing parts of the curriculum in non-formal learning environments.

E. Tech-savvy and human-centred

A key issue is whether the SDGs can be achieved through incremental change or the focus should be on disruptive projects. Proponents of the second approach have often turned to technology in order to bring about large impacts that can reach, potentially, billions of people – see Project Breakthrough[31], which aims to focus on

29. Souto-Otero, M. 2021. Validation of non-formal and informal learning in formal education: Covert and overt. European Journal of Education, 56(3), pp. 365-379.

30. Federal Ministry for Education and Research. 2017. National Action Plan on Education for Sustainable Development: The German contribution to the UNESCO Global Action Programme. Berlin. p. 42.

31. (http://breakthrough.unglobalcompact.org/disruptive-technologies/new-realities/).

initiatives that can bring about disruptive rather than incremental change for the achievement of the SDGs (through virtual reality, augment reality and mixed reality), although adopting primarily a business focus rather than a focus on education. We should not be looking for a technological fix[32] to VET, in spite of the popularity of this approach[33]. However, technology undoubtedly has great potential to contribute to VET sustainability and to bring about scalable innovations[34]. New technologies such as virtual reality (VR), artificial intelligence (AI), big data, blockchain or robotics can transform the way VET is thought of and delivered, including through the creation of new learning environments, increasing organisational resilience and the facilitation of collaboration between institutions. Other tools such as learning analytics offer the promise of more individualised learning. Technologies can enable VET institutions to become more efficient, doing more with less, consuming less of the planet to train and educate through simulations of work situations rather than actual performance using high-energy-consumption machines, and through sharing and re-using resources, for example. The German Research Centre for Artificial Intelligence (DFKI) provides an interesting example of investment in the development of new technologies and methods to support training, teaching and learning in collaboration with education institutions, research centres, and EdTech companies[35]. The US-based non-governmental organisation Xprize, which aims to fund radical breakthroughs, recently launched a competition on rapid re-skilling, a 30-month competition to reskill under-resourced workers for the digital revolution by making intensive use of technology in continuing VET.

Technology can also help to inform VET curriculum design and provision, to make it more responsive to labour market needs. Labour market intelligence has been transformed in recent years. Time-lags in the reception of information about labour market trends can hamper responsiveness. Classic employer surveys were faced with lack of precision in the data they collected on skills required or the geographical and occupational area where those skills were needed, and can take months – sometimes years – to design and process. Today, new sources of information are available that help to address some of these shortcomings. Millions

32. Robins, Kevin and Webster, Frank. 1989. The Technical Fix: Education, Computers, and Industry. Basingstoke, Macmillan.

33. As already noted by Pavlova, Margarita. 2008.

34. OECD. 2009. Working out change: systemic innovation in vocational education and training. OECD, Paris, France.

35. See (https://www.dfki.de/en/web/technologies-applications/fields-of-application/learning-and-education). Checked on 9 September 2022.

of online job adverts provide labour market data in real time, and information on their skills requirements is parsed with great precision[36]. In this way, the identification of emerging skills or new occupational profiles can be more agile. Increasingly granular geographical information about labour market demands can inform the organisation, rationalisation and specialisation of curricular offerings at the local level. Vendors like Vector in the UK, endorsed by the Association of Colleges, bring together labour market information, demographic information and supply data on existing educational offerings in post-16 further education to inform institutions' curriculum decisions, enable them to avoid overlaps and find new niches. Naturally, providers cannot chase today's demands all the time. This is impossible. But they should not be persistently oblivious to labour market trends and systems for curricular change need to be flexible enough to enable them to respond to change. Supply data also needs improvement, as information on qualifications with strong currency in the labour market or where to find a good provider – transparency of the training market – is still hard to come by for learners.

Technology adoption may be affected by factors such as the psychological and health impacts that prolonged exposure to immersive virtual environments could have or concerns with privacy. There are also great concerns about privacy or reductionist approaches to education. Technologies are not without their perils, and it is important to assess and use technology critically. But they also have great promise in helping with individualisation, inclusion, efficiency and safety in VET.

F. Provision of adequate resources

The education system needs resources to contribute to sustainability and to be sustainable itself. SDG4 makes explicit reference to this. There is a widely acknowledged "investment gap" in VET, and this underinvestment needs to be reversed. Financial resources, on the other hand, do not need to be proportional to the scale of change required. Disruptive thinking and new efficiencies can be found to break that relationship.

Resources are not only economic, but also human. Qualified teachers and educators, in particular in countries where teacher training may have been traditionally less strong, need professional development on education for sustainable development. But the need is widespread, as clearly recognised in the Irish Second National

36. For a discussion of the potential and limitations of this type of data see Brown, Phillip, and Manuel Souto-Otero. 2020. The end of the credential society? An analysis of the relationship between education and the labour market using big data. Journal of Education Policy 35(1): 95-118.

Strategy for Sustainable Development "ESD to 2030"[37] and the UK sustainability and climate change strategy for education and children's services systems[38]. Investing in the upskilling and reskilling of the VET teaching workforce is essential to making sustainability present in VET centres. Supporting VET ecosystems with strong quality assurance systems is needed, and sustainability aspects can be included as quality criteria in existing management and inspection regimes.

Learners need to contribute their "human resource" to VET too. This entails attendance, which in turn may require investment in scholarships, new infrastructure in rural areas or adaptative technologies to provide real opportunities for all learners. But it also includes motivation and enthusiasm, which are essential components for learning. These can be facilitated in a variety of ways, including through greater linkages with non-formal education, as discussed above. A note of caution is required here. Just like governments will not be asked to allocate all their resources to VET, neither should VET learners. There cannot be sustainable life without learning, but formal learning is only a part of life. Formal education that becomes pervasive in learners' lives is not sustainable – financially, emotionally, physically – and this can be overlooked at a time of obsession with benchmarking and assessments. This can result in unsustainable "effort inflation" in the endeavour to obtain better performance in education through, for example, intensive use of additional tutoring and the shadow education system[39]. This risk tends to be more accentuated in Asian countries like South Korea, Japan, India, Cambodia or China – where government actions have been adopted to try to redress the trend – than in Europe, and in general rather than in VET tracks, but is a factor to keep in mind when we think about a sustainable future for VET.

37. Government of Ireland. 2022. 2nd National Strategy on Education for Sustainable Development. ESD to 2030. (https://www.gov.ie/en/publication/8c8bb-esd-to-2030-second-national-strategy-on-education-for-sustainable-development/). Checked on 28 July 2022.

38. Department for Education. 2022. Sustainability and climate change: a strategy for the education and children's services systems. (https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy/sustainability-and-climate-change-a-strategy-for-the-education-and-childrens-services-systems#action-area-3-education-estate-and-digital-infrastructure).

39. Bray M. 2022. Shadow Education in Asia and the Pacific: Features and Implications of Private Supplementary Tutoring. In: Lee W.O., Brown P., Goodwin A. L., Green A. (eds,). International Handbook on Education Development in Asia-Pacific. Springer, Singapore.

3. CONCLUSIONS

This article has reviewed the concept of sustainability in education and its incarnation in SDG4. Against the present challenging environment, it reflected on sustainable development's role, practice and approaches in VET, discussing its environmental, economic and social dimensions. It presented six guiding principles to consider in the path towards ensuring sustainability in VET. These refer to the adoption of a holistic conceptualisation, inclusion, responsiveness, permeability, human centredness in the use of technology and appropriate provision of resources. It is hoped that these reflections may spur greater progress towards sustainable development in and of VET.

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