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Book

Innovations in knowledge and learning : postsecondary education reform to support employment and inclusive growth

INNOVATIONS IN KNOWLEDGE AND LEARNING

POSTSECONDARY EDUCATION REFORM TO SUPPORT EMPLOYMENT AND INCLUSIVE GROWTH

Jouko Sarvi • Hitendra Pillay

ASIAN DEVELOPMENT BANK

50 YEARS

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ADB recognizes "China" as the People's Republic of China; "Hong Kong" as Hong Kong, China; "Korea" as the Repubic of Korea; and "Hanoi" as Ha Noi.

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Abbreviations

ADB	Asian Development Bank
CPD	continuous professional development
DMC	developing member country
HRD	human resource development
IB	International Baccalaureate
ICT	information and communication technology
IT	information technology
KOICA	Korea International Cooperation Agency
NQF	national qualifications framework
OECD	Organisation for Economic Co-operation and Development
OER	open educational resources
QA	quality assurance
TVET	technical and vocational education and training
VET	vocational education and training

Executive Summary

The postsecondary education space is confronted with several simultaneous challenges such as (i) increase access and equity, (ii) improve quality and relevance, (iii) respond to an exponential increase in new knowledge, (iv) integrate new understandings of human learning into teaching and learning, and (v) consider options and innovations in new delivery modalities including technology-mediated modalities in education. These expectations are fuelled by a growing middle class as the majority of developing countries transition to middle-income status. To resolve these challenges within the existing linear, hierarchical structures, reliant on traditional rigid time frames, may not be possible. External pressures are already blurring some of the boundaries of the postsecondary education landscape. It is apparent that doing more of the same may not provide the necessary solutions; it requires disruptive thinking. There is a need to commit to exploring new options and opportunities for reforming the postsecondary education space, including system structures, content designs, and delivery strategies. A reluctance to recognize and embrace disruptions in an educational culture that tends to be wary of change can stifle thinking about innovative ways to improve education and skills training services and about an equitable provision by expanding opportunities to all.

Historically, in most countries, the provision of postsecondary education services has always been the role of government, and consequently a mix of legislation and public-sector regulations has been adopted for governance and management. However, in recent years, education has been rebranded as a commodity for trade and has thus generated interest from nontraditional service providers. Consequently, traditional structural, legal, and functional boundaries within the public education system are blurring. Existing governance and regulatory mechanisms need revisiting to encourage nontraditional service providers not only to participate but also to ensure that equitable access to increasingly diversified education opportunities is available to all. Also, the commercialization of education services risks exploitation to maximize profits. It is important for the government to implement an effective regulatory framework to provide quality assurance and transparent governance and to monitor the quality of education services provided by both public and private institutions, and to implement appropriate social protection measures.

Service providers in the postsecondary space can be categorized as public, private, or cross-border providers. Accompanying their proliferation are high levels of competition and innovative programs at all levels within the postsecondary space. The competition warrants new investments in infrastructure, equipment, appropriate human resources, and relevant programs to establish and maintain a competitive advantage over others. In most of the Asian Development Bank's (ADB) developing member countries (DMCs), public-sector postsecondary education facilities and programs require serious modernizing.

A range of innovative modalities for partnerships among local public and private providers and with internationally recognized private and public education service providers is becoming the norm. Development partners' support and philanthropy are also helping strengthen public postsecondary education services. While investments in infrastructure and physical facilities may be necessary, they need to be conceptualized and built to maximize utilization—the luxury of having dedicated facilities for each level (technical and vocational education and training, polytechnic, university) and at each institution may no longer be possible. Overzealous competition can undermine collaborative opportunities to achieve mutual benefits. Often, reinventing programs, duplicating open educational resources, building dedicated online platforms, etc. are driven by non-education agendas and seriously undermine the expansion and quality of education services.

The push for highly qualified human resources in DMCs has unintentionally skewed the focus toward university degrees and selected highly specialized areas when the human resources needs of many DMCs are very diverse. This has led human resource development programs to be out of sync with workforce demands, resulting in an increasing incidence of overqualified graduate unemployment in some DMCs. This mismatch is being partly remedied by additional training, often in practical skills, or by lower paid jobs, which risks creating wage distortions. Obtaining a perfect match may not be possible; however, providing flexibility—by having core foundational subjects and options to choose courses to supplement evolving knowledge gaps—may be possible. Programs around "knowledge clusters" can help graduates adapt to emerging demand areas without having to go through extended retraining programs or start new degrees. This requires transparent articulation between programs and pathways. The increase in portfolio workers[1] and self-employment requires workers to be equipped with knowledge, skills, and applications within their respective knowledge clusters. Also, the increasing use of technology to continuously support professional discussion forums is gradually providing an alternative means for individuals and institutions to respond to the ubiquity of knowledge and learning, and the continuous need to upgrade oneself.

As the demand for postsecondary education increases and more nontraditional service providers emerge, the means through which education services are delivered also evolves. While some infrastructure may be necessary, designs will be different to include e.g. teaching studios and e-libraries. One has to be mindful of the disruption caused by information and communication technology, transnational delivery, work-integrated learning, flipped classrooms,[2] and other hybrid modalities when investing in huge physical assets in central campuses. Delivering services through global partners by adopting franchising models similar to the Cisco Networking Academy and its partners, the use of satellite colleges both locally and off-shore, and institutional twinning arrangements all require a different conceptualization of university facilities. Often huge infrastructure investments are made for symbolism and marketing to capture the burgeoning demand for postsecondary education. To support new modalities of delivery, some DMCs may

[1] Charles Handy wrote in 1989 about the emergence of "portfolio workers," individuals who reject the notion of a single, permanent job, rather using their varied skills, interests, and achievements to secure a number of often-temporary roles with a variety of organizations.

[2] The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short tasks are given to do at home—video lectures or online learning materials are viewed by students at home before the class session—while in-class time is devoted to exercises, projects, or discussions. https://ed.ted.com/on/i8Pk1e3C

leapfrog and establish e-libraries instead of huge centralized physical buildings. The service providers have to be agile and responsive to changing labor market demands and able to deliver efficiently and at all geographic locations.

Since the majority of ADB's DMCs have progressed to middle-income status, diverse and multiple points of disruption will likely be needed to support human resource development that is in line with the diversification of economies and pace of development in these DMCs. Small, incremental changes in human capital development driven by industrial era thinking are no longer sufficient.

Background and Context

Disruptive innovation in education to support inclusive development

Disruptive innovation is considered one of the key drivers of inclusive growth; a country's ability to understand, adapt, and absorb disruptions will provide an advantage in the current highly competitive world. The concept can simultaneously be destabilizing and yet innovative. Disruption works by significantly changing the conceptual and structural ways in which we think, behave, do business, learn, and go about our day-to-day activities. Harvard Business School Professor Clayton Christensen (Christensen et al., 2015) says that a disruption displaces an existing market, industry, practice, or technology, and produces something new and more efficient and worthwhile. Disruptive innovation has been widely associated with information and communication technology (ICT) applications, but, as noted by Christensen et al. (2015), it is equally relevant to transforming other aspects of socioeconomic systems, including the education sector. For instance, the mainstreaming of nontraditional knowledge systems is disrupting program design in higher education.[1] Disruptions in the education sector, triggered by innovations in ICT, the ubiquity of knowledge and learning, and big data research, provide impetus for seeking new ways to increase access to and quality of education services.

Unfortunately, today's decision-makers are too often trapped in traditional, linear thinking, or too absorbed by the multiple crises demanding their attention, to think strategically about leveraging the forces of disruption and innovation that are already shaping various aspects of our human resource development (HRD) systems. A reluctance to recognize and embrace disruptions in an educational culture that tends to be wary of change can stifle thinking of innovative ways to improve education and skills training services and their equitable provision by expanding study opportunities to all.

Supporting inclusive growth to optimize benefits in an increasingly diversified economy that has multiple new opportunities requires new lenses to analyze and conceptualize the challenges.[2] Similarly, transforming the human capital development practices of old economies, such as industrial nations, to practices of knowledge economies and beyond warrants managed disruptions to stimulate innovative programs and practices. The need

[1] See J. Sarvi and H. Pillay. 2015a. *Innovations in Knowledge and Learning for Competitive Higher Education in Asia and the Pacific.* Manila: Asian Development Bank (ADB).

[2] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank 2008–2020.* Manila.

to accelerate human capital development processes to ensure timely responses to new human resource demands makes it necessary to eliminate redundancies and unwarranted duplications in types of programs and delivery modalities. Disruptive innovations bring new approaches that can accelerate capacity development and be inclusive, as they do not have baggage from entrenched traditional practices that may require "unlearning" before one can strategically seek and embrace novel solutions.

In recent years, disruptions to HRD have been triggered by evolution in the labor market, rapid urbanization and demographic trends, emergence of new technologies, new conceptualization of the knowledge and learning process, and greater access to knowledge and education, all fuelled by a growing middle class. The majority of the Asian Development Bank's (ADB) developing member countries (DMCs) have progressed to middle-income status.[3] Consequently, multiple points of disruption will likely be needed for supporting HRD to match the diversified economies and the pace of continued development in these DMCs. Small, incremental changes in human capital development, driven by industrial era thinking, are no longer sufficient.

Against the above background, the exponentially growing, diverse, and sustained demand for education and skills development is disrupting the "postsecondary education space." To meet this challenge, countries around the world, including ADB's DMCs, have been trying to maintain or gradually increase investment in education. However, doing more of the same may not provide solutions. There is a need to commit to exploring new options and opportunities for reforming postsecondary education, including system structures, content designs, and delivery strategies.[4]

Rethinking the postsecondary education space

The postsecondary education space is a continuum starting from secondary school and progressing to postgraduate studies in universities. Increasingly, countries realize that postsecondary education cannot be seen as fragmented and rigid, operating within traditional structures and providing liberal education detached from the world of work and improved quality of life. Furthermore, as an interface with real-world expectations, the education services in this space must respond to changing expectations of knowledge, skills, and human capabilities.

The postsecondary education space includes formal, nonformal, and informal paradigms, or a combination of these, to provide access to education. These education opportunities may be delivered by both public and private providers to ensure that all citizens have equal opportunities to become productive members of their society.

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[3] By 2020, only two ADB DMCs are expected to remain low-income countries. ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of Transforming Asia and the Pacific.* Manila.

[4] Demand is increasing for innovative approaches for postsecondary education reform to help improve graduates' employability and support inclusive economic growth. ADB presented issues of this paper in the Central Asia Regional Forum held on 7-8 July 2017 in Bishkek, the Kyrgyz Republic. The paper incorporates feedback from forum participants. The analytical work and forum are activities of Regional Technical Assistance (TA -8744 REG): Education and Skills for Employment in Central and West Asia.

At the secondary education level, apart from traditional academic secondary programs, initial vocational education and training programs or accelerated pathways to university programs[5] are increasingly becoming the norm. The postsecondary education space encompasses (i) traditional trade training, which often resides with labor ministries; (ii) technical and vocational education and training (TVET), which often is the responsibility of several line ministries; (iii) higher education, which is sometimes under a separate ministry; (iv) adult and nonformal education, which are typically linked to general education; and (v) continuous professional development (CPD), which is driven by professional associations and industry requirements. The role of CPD is increasingly becoming an essential option for retaining the currency of professional competencies or assisting with retraining for new and emerging work practices that are often not appropriately supported. A number of disruptions emerge simultaneously in the postsecondary education space and are discussed next.

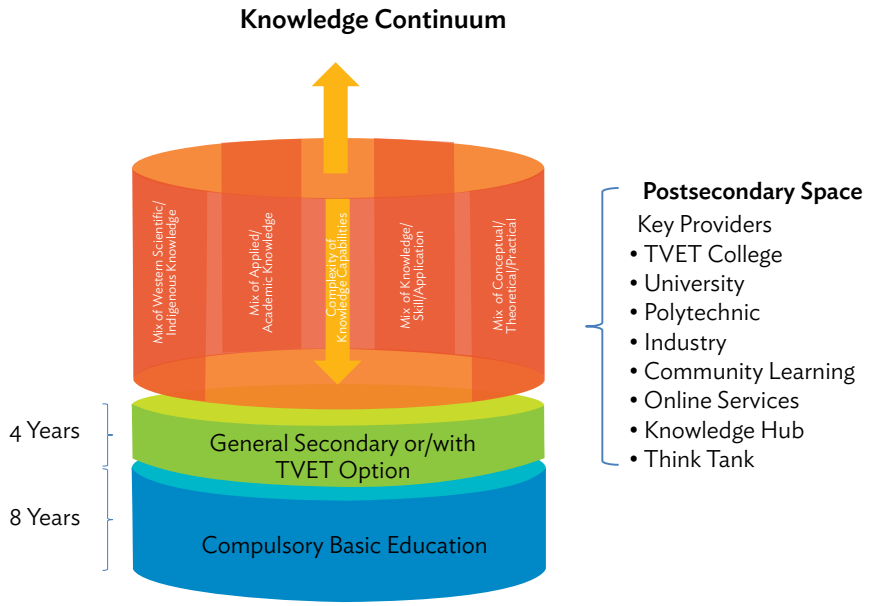
Figure 1 illustrates the multidimensional nature of the emerging types and sources of knowledge complexities in the postsecondary education space. It shows the vertical dimension as a continuum that represents the traditional hierarchy of human competency development. Typically, the pathways progress upwards, which is being disrupted to become bidirectional, where university graduates seek lower level certificate courses to learn practical applications and increase their employability.[6] All key providers are competing for a share of this space and thus are blurring the traditional boundaries to establish pathways. More advanced skills such as research analytics, traditionally reserved for postgraduate studies, are now introduced at lower levels. The recognition of new knowledge types—changing expectations for an optimum mix of required knowledge—raises questions about appropriate entry points on the knowledge continuum. It also raises concerns about the current structure of postsecondary education services.

Figure 2 illustrates another emerging challenge: While the mix, types, and sequencing of knowledge complexity are changing, lateral adjustments of knowledge and skills accelerate retraining for new jobs, expanding skills and knowledge to diversify the capacity to become "portfolio workers," "knowledge workers," or "workers without borders" (Simeon, 2013). To allow increased cross-disciplinary competencies, universities in the West are establishing "super faculties" that support "knowledge clusters" so that students may select common subjects offered across a number of disciplines within a cluster or specialized subjects from a wide range of options within a single knowledge cluster. Figure 2 presents an indicative arrangement of knowledge clusters. In some Organisation for Economic Co-operation and Development (OECD) countries, special "institutes" have been established to help broach a number of traditional discipline boundaries and levels (TVET, polytechnic, and university) of knowledge and expertise. While these institutes are conceptually sound, they introduce another level of bureaucracy and are often not workable because of the traditional models of financing in the postsecondary education space.

[5] For example, the International Baccalaureate (IB) program includes university-level subjects in its secondary education program that give credit toward first-year university programs. IB programs are offered as normal education service in Australia and New Zealand, integrated with national programs in state and private schools. See http://www.exfin.com/ib-schools-australia

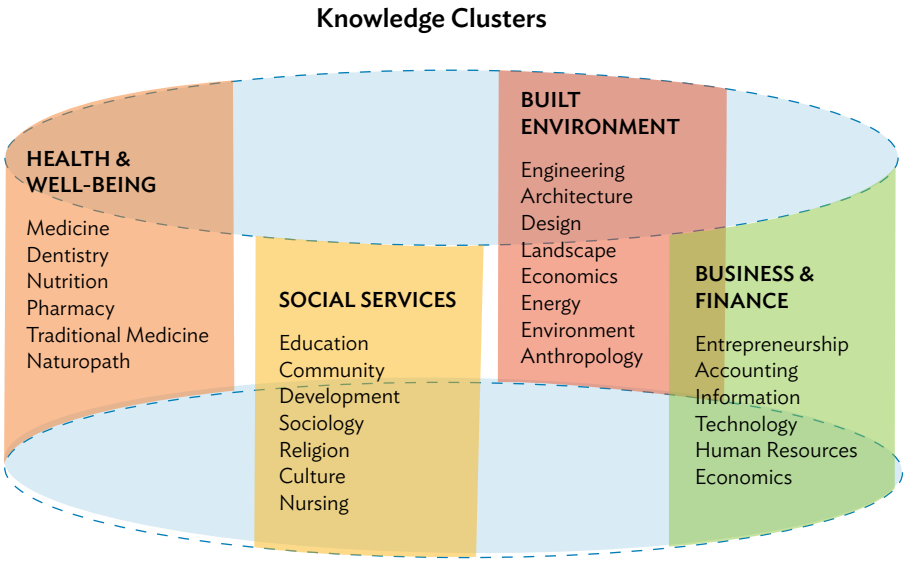
[6] Information technology graduates of universities often seek, for example, either a Cisco or MS network engineering certificate to enhance their work opportunities. Accounting graduates seek technical qualification to use accounting software.

Figure 1: Emerging Knowledge Types in the Postsecondary Space



Source: Authors.

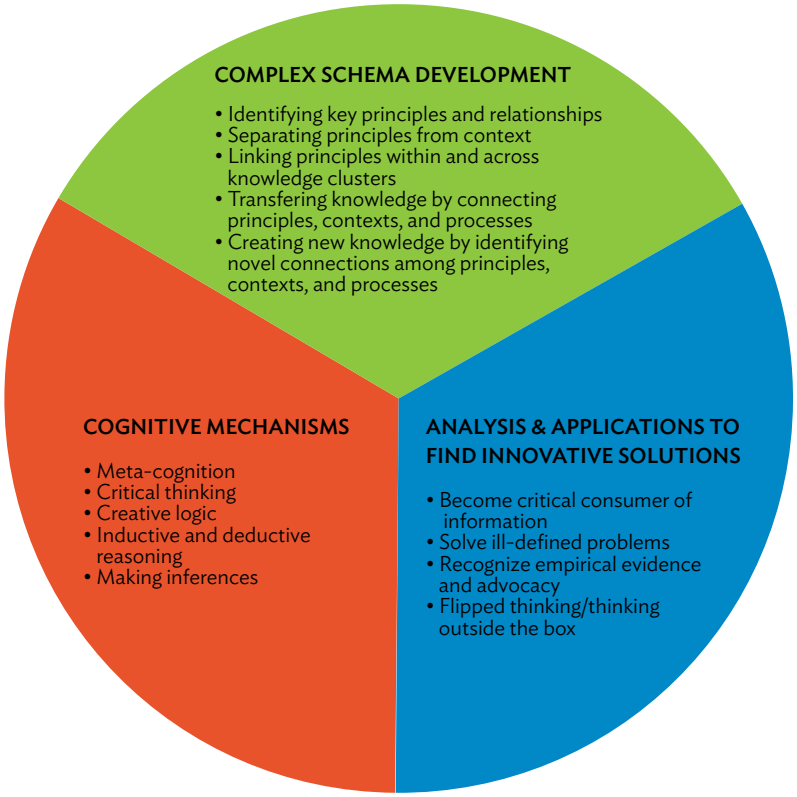
Figure 2: Emerging Knowledge Clusters to Increase Cross-Discipline Knowledge Sharing



Source: Authors.

Related to the lateral adjustments, Figure 3 presents the underlying capabilities and capacities that support knowledge workers, also referred to as cross-cutting knowledge capabilities or soft skills. Unlike previous workers, 21st century workers are not dependent on specific contextualized competencies (often associated with specific jobs); rather, they leverage fundamental knowledge and cognitive competencies to extend and apply the same in new contexts—these people are self-directed, able to readily transfer knowledge and skills to service emerging demand, and often create their own work. Figure 3 presents a summary of some of the attributes that may be necessary to facilitate cross-cutting knowledge capabilities. These should be embedded in every program in postsecondary education and be explicitly taught to help students make the links among principles, contexts, processes, etc.

Figure 3: Cross-Cutting Knowledge Capabilities



Source: Authors.

Recognition of the ubiquity of knowledge and human learning, confounded by innovative use of technology for teaching and learning, and the current wide range of overlapping education programs have attracted multiple service providers in the postsecondary education space. The above scenario, juxtaposed against exponential growth in demand for education and the constantly changing expectations of learners and employers, requires new ways of thinking about this critical space within the education sector. A redefinition of the postsecondary education space will witness many of the traditional structural, legal, and functional boundaries blurring; hence, the rest of this report will elaborate on the disruptions that may occur in the near future.

Governance and Regulations

Legislation to increase access to and diversification of programs

Historically, in most countries, provision of postsecondary education services has always been the role of the government, and consequently a mix of legislation and public-sector regulations has been adopted for governance. Such legislation and regulations are based on the beliefs that investment in education is a "public good" and that the outcomes provide a qualified workforce and enlightened citizens. These governance and regulatory mechanisms ensure equal access and a minimum quality of service for all. However, often the progress toward these objectives is undermined by poor institutions and inadequate implementation capacity. Despite the increasing evidence that equitable access to the diverse education opportunities that lift the lowest quintile of the population participating in postsecondary education and skills development can significantly improve inclusive economic growth,[7] governments in many DMCs still need significant support to fully implement inclusive policies and enforce necessary regulations.

Rebranding education as a trade commodity has disrupted how we think about providing education services. It has provided the impetus for increased private-sector involvement at all levels of the postsecondary education space. The rebranding of education as a commercial enterprise has not only stimulated local private-sector service providers but has also attracted interest and competition from regional and international cross-border providers. The private sector is willing to provide education services at a cost that could include both not-for-profit and for-profit business propositions. The growth of the private sector and cross-border education providers as commercial investments will continue. For example, in Indonesia, of a total of 4,274 higher education institutions, 3,906 are private (Pusat Data Pendidikan Tinggi, 2015). Indonesia also has the highest number of transnational education programs in Southeast Asia. Similar trends can be seen in other Asia and the Pacific countries such as Malaysia, Philippines, Thailand, and Viet Nam.[8] The unprecedented increase in cross-border providers operate under a range of different

[7] See, e.g., ADB. 2015. *Key Indicators for Asia.* Special Chapter on Smarter Future: Skills, Education and Growth in Asia. Manila; ADB. 2014. *Framework of Inclusive Growth Indicators. Part I—Overcoming Education Inequities: Pathway to Inclusive Growth.* Manila; ADB. 2012. *Counting the Cost—Financing Asian Higher Education for Inclusive Growth.* Manila; ADB. 2010. *Strengthening Inclusive Education.* Manila.

[8] ADB. 2012. *Private Higher Education Across Asia. Expanding Access, Searching for Quality.* Manila.

approaches,[9] wherein legal obligations may reside in another jurisdiction and not those that receive the services. The traditional legal framework for postsecondary education may no longer be appropriate.

This increased private sector involvement does not necessarily change the "public-good" rationale, as education can still be defined as a public good, no matter who provides the services, as long as there are proper regulatory mechanisms in place. It is important for the government to implement an effective quality assurance (QA) and monitoring system to guarantee that education services provided by public and private institutions meet the required standards, and to implement appropriate social protection measures (e.g., tuition subsidies for poor students attending private education institutions). Also, the QA mechanism should ensure that there are no unnecessary prerequisites or repetitions in the programs that increase profiteering, and that all students, including those from disadvantaged groups, have equal access to services provided by all providers. There is increasing pressure on this policy shift, as it has become evident that governments alone cannot provide all education services and they cannot effectively undertake the multiple roles required: formulating policies and strategies for education and skills development, monitoring quality and standards, and also providing education and training services for all students.

In light of the proliferation of service providers in the postsecondary education space, a blurring of programs and qualifications is evident. For instance, what constitutes certificate, diploma, 2-year associate degree, bachelor's degree level programs, etc., and ensuring that all providers deliver agreed-upon minimum quality education and training, are becoming a source of disruption. In some countries there is a wide range of entry prerequisites for similar programs, leading to similar qualifications; and the durations of similar programs vary, so there is no simple, quick-fix solution for their coordination and harmonization. A careful review of the situation in each country, with cognizance of the context, is required, including the review of education and training legislation and regulations, and the need for updating them, as necessary. Furthermore, to ensure cross-border recognition of programs, regional memoranda of agreement between the national regulatory and QA bodies may be necessary to develop credit transfers. Also, international benchmarking[10] of local and cross-border programs may be necessary to ensure alignment with 21st century human resource competencies and training standards.

The reaction to increasing private-sector providers in many DMCs is either to stop their involvement because of a lack of governance tools or to ignore the private providers as long as they do not take market share from public-sector providers. Such responses may not be productive and can stifle growth and development in the education sector, particularly when there is a growing need to expand access and diversify programs. The challenge for DMCs is to review and revise their legislation to allow and encourage private-sector and cross-border providers to engage, while at the same time ensuring that quality products and services are provided to protect citizens from being exploited. Some jurisdictions

[9] There are twinning, off-shore distance education, joint ventures, public-private partnerships, off-shore campuses, etc.—all with different legal requirements. See ADB. 2012. *Regional Cooperation and Cross-Border Collaboration in Higher Education in Asia. Ensuring that Everyone Wins.* Manila.

[10] This is particularly important for DMCs that are exporting labor—to protect their citizens from exploitation by employers in foreign countries who may not fully recognize their qualifications.

have taken steps to protect the interests of their citizens. For instance, Malaysia requires all cross-border service providers to have a physical presence in Malaysia, which ensures legal liability in the country where the service is provided. The European Union has adopted various frameworks such as the Bologna Declaration for higher education and the European Training Framework for TVET. These provide a good framework (although they are not legally binding) for program structure and transfer of credit within and across borders to eliminate duplication and consequently the additional costs to students and parents.

However, implementation of regulations has been a challenge. Considering the commercialization of education services, there is ongoing debate regarding how to determine the value of education. Those who take a market liberalization view argue that the market should regulate the price, whereas social justice and equity proponents argue that the government should regulate the market to ensure fairness and that everyone has an equal opportunity to access postsecondary education services and not be exploited. Considering that the market by nature is inherently greedy (Skidelsky, 2015) government intervention to regulate service provision is necessary, hence the need for appropriate legislation and QA mechanisms. While the government may regulate the market, there have to be sufficient incentives to encourage the providers. In the case of "last-mile" access, particularly for rural and remote communities, government subsidies may be used strategically to incentivize both private- and public-service providers.

Quality assurance of postsecondary education

The rapid increase in the number of private and cross-border postsecondary education service providers, in addition to public institutions, can significantly increase the challenge to enforce regulatory compliance to ensure that a minimum quality of services is provided by all. The commodification of education services can be a "double-edged sword." It can either create increased access to quality education for all to meet the growing demand, or it can risk increased poor-quality education service, taking advantage of the demand created by the growing middle class and the accelerating rural-to-urban migration seen in many DMCs. However, the risk can be minimized by the government through establishing adequate regulatory frameworks and QA mechanisms for all education service providers. This should be equally applicable to public providers and not be seen as discriminatory toward private providers only. It should be a national approach to ensure the quality and relevance of education and training.[11] Many developed countries have successfully leveraged nongovernment sector involvement by adopting good governance regulatory mechanisms to oversee QA. For example, in Australia, the quality of both TVET and higher education is regulated through appropriate legislation to ensure that minimum standards are always maintained.

The fact that, in many DMCs, the government is a service provider as well as the quality regulator presents a conflict of interest. QA systems are better served if they are

[11] ADB. 2009. *Good Practice in Technical Education and Vocational Training.* Manila; ADB. 2012. *Private Higher Education Across Asia: Expanding Access, Searching for Quality.* Manila.

independent of the government bureaucracy. The regulatory mechanisms should be designed in such a way that they apply the same standards to public, private, and cross-border service providers, and take into consideration social protection measures to ensure inclusive postsecondary education—including female students and students from poor families, remote areas, and ethnic minority groups. A number of QA initiatives have been implemented in many countries. Three such initiatives are discussed below.

A well-conceptualized quality framework, such as a national qualifications framework (NQF),[12] acknowledges the complementarity of knowledge, skills, and application, and recognizes that this integrated capacity is necessary at all levels—from school-based TVET programs to postgraduate university degrees. Some countries have introduced separate national frameworks for TVET and higher education, which perpetuates the binary thinking of skills versus knowledge, and consequently presents not only a barrier for portfolio workers but also continues to stigmatize TVET as a second-chance program. An International Labour Organization study notes that a national system, such as an NQF, is not an easy, quick-fix option, but is central to establishing an integrated vision for strengthening the postsecondary education space (Allais, 2010). For example, Azerbaijan and Kazakhstan are pursuing the development of NQFs and recognize the challenges of developing and implementing such a framework.[13] While an NQF is often perceived as a government initiative, its successful development and implementation require extensive, long-term commitment and continuous support from both the public sector and private industry stakeholders.

Associated with an NQF are QA mechanisms to ensure that the programs meet the standards noted in the NQF. Course development and accreditation are means to ensure the quality and comparability of postsecondary programs within and across borders. Some countries have industry-approved course guidelines for both TVET and higher education programs that are listed on a national repository.[14] These courses are developed in close collaboration with industry and professional bodies to ensure demand-side quality, and relevance requisites are appropriately incorporated. Having an agreed-upon minimum QA requirement within the course content makes it possible to expect a common minimum competency outcome, where the delivery may be varied, since different providers are involved. Such a mechanism allows governments to engage private-sector providers to deliver services to targeted disadvantaged groups; governments often provide subsidies to the service providers to take their services to areas underrepresented by public-sector providers.

The quality of the service providers may be managed by establishing a registration process ensuring minimum standards for staff and facilities of all potential providers. Nationally adopted courses and listing of registered service providers increase transparency and allow individuals to select courses or subjects at either public or private providers, or at a mix of both. Students should be able to transfer between programs within the postsecondary

[12] See Australian Qualifications Framework. http://www.aqf.edu.au/aqf/in-detail/aqf-levels/

[13] Ministry of Education's presentation on National Strategy on Development of Education, at donor coordination meeting, Baku, Azerbaijan, 22 February 2016.

[14] Information on lists of courses approved by, e.g., the German Government and the European Union, can be found here: eurhttp://www.bibb.de/en/occupationsinfo.php/certificate_supplements/en

education space without having to unnecessarily repeat subjects or study program modules.

Standardized industry-approved courses, as a means to manage compliance of minimum quality across programs, have been further developed by some countries through the use of ICT. In some DMCs, high-demand programs and subjects have teaching and learning resources developed as open education resources (OERs) covering key content areas.[15] These OERs are publicly funded and available to all public and private service providers. The limited access to good teaching and learning resources (at all levels in the postsecondary education space) is a major contributor to poor quality graduates. Since OERs are usually free, the assumption is that, if all colleges use the publicly provided OERs, this ensures a minimum level of teaching and learning at all levels and in all high-priority programs to support 21st century skills (literacy, numeracy, analytical, and cognitive skills). The value of OERs and online learning is increasingly gaining recognition; many multinational companies have developed online educational resources to provide after-sales support for their products. These are made available to clients and practitioners to upgrade their product knowledge. Traditional publishers are also increasingly getting involved in the production of more creative e-learning materials.

Increasing access to meet growing demand is not the only concern for postsecondary education planners; relevance and quality of the programs are equally important, particularly when delivery of education services has become a business and risks profiteering instead of providing high-quality and relevant services. It needs appropriate regulations and mechanisms to ensure that education programs and service providers meet minimum quality standards. These regulations and QA mechanisms are needed for a transparent and equitable system. Such a system needs to be responsive to actual and anticipated demand for quality education and training. Furthermore, a robust and transparent QA system encourages individuals to freely enroll in single modules or whole programs, with a clear understanding of genuine value adding, and discourages rent-seeking behavior by service providers.

[15] J. Sarvi, G. Dhanarajan, and H. Pillay. 2015. *Open Educational Resources: Enhancing Education Provision and Practice.* Manila: Asian Development Bank.

Diversification of Education and Training Service Providers

We can classify the main service providers in the postsecondary education space into three groups; public, private, and cross-border. In light of the huge demand, there is room for all three groups as long as they offer high-quality and relevant educational products and services. The service provider groups may be involved at any or all levels of national HRD ranging from trade level programs to postgraduate degrees, depending on the respective providers' interests and capacity.

Public-sector institutions

Most DMCs have established government institutions along traditional structures of TVET, higher education, and nonformal education that may not be readily disrupted. They will remain part of the postsecondary human capacity development system, but how they operate will have to change for them to remain viable. One significant change will be a need to be competitive and responsive to workforce demands. Traditional supply-side planning, through annual financing from central government budgets, can no longer be a privilege of public institutions in the postsecondary space. Competition is increasing within public education institutions and with other nontraditional education and training service providers. The enabling legislative reforms discussed earlier must be cognizant of the need to be fair and to ensure equal opportunities for all private and public service providers. To become competitive and address new labor market demands, public postsecondary institutions require investments to renew equipment, to develop new and upgraded programs, and to develop staff with new knowledge and skills mix to deliver the new knowledge and skills. There are various options to upgrade facilities and human resource capacity, for instance through the government's own funds, such as the Nazarbayev University initiative in Kazakhstan; development partner-supported initiatives such as the Korea International Cooperation Agency (KOICA) partnership with the Government of Uzbekistan targeting TVET; the Government of Indonesia partnering with ADB to target polytechnic colleges; and the ADB and the Government of Viet Nam partnering to target higher education.[16]

[16] ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Indonesia for the Polytechnic Education Development Project.* Manila; ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Socialist Republic of Viet Nam: University of Science and Technology of Hanoi Development (New Model University) Project.* Manila. The Nazarbayev University was established to modernize higher education in the country. It has international staff, uses English as the medium of instruction, and has many international partners that collaborate in teaching and research. See http://nu.edu.kz/portal/faces/mainmenu/aboutus1?_afrLoop=466059904306274&_afrWindowMode=0&_afrWindowId=wg9ok7w69_32#%40%3F_afrWindowId%3Dwg9ok7w69_32%26_afrLoop%3D466059904306274%26_afrWindowMode%3D0%26_adf.ctrl-state%3Dwg9ok7w69_49. The Korean Aid supported Uzbekistan to modernize its TVET College in Tashkent. http://news.uzreport.uz/news_4_e_129254.html

Education investment traditionally has been conceptualized as targeting subsector-specific programs and infrastructure; thus it is often seen as exclusive to the subsector or an institution. For instance, TVET laboratories and workshops are often designed for exclusive purposes when they could rather be designed as multifunction facilities so they could be used for programs across sectors and levels of postsecondary education. The same facilities could also be shared by neighboring schools. Under the current approach, these physical infrastructure facilities are considered institutional assets and are not shared with other postsecondary institutions. These huge infrastructure investments need to be opened up for sharing across the postsecondary space to maximize utilization and increase the return on investments. For example, university-affiliated colleges could access central library services, particularly given the increased expansion of ICT in the DMCs and the advantages of digital libraries. This can be cost effective and also increase access to high-quality learning resources by smaller affiliate colleges.

The increasing demand and continuously evolving education programs warrant flexibility, not just in program design, but also in infrastructure and human resource investments and utilization. Public-sector investments and performance in the postsecondary education space should target the quality and expansion of service provision rather than the type of institution or the level of program, e.g., a fully equipped engineering laboratory may be used for training technicians (2-year associate degrees) as well as for graduate engineers. Finally, the increased private-sector involvement in providing postsecondary education services within urban centers may help bring about flexibility in sector financial planning, as the limited public-sector funds may then be targeted to increase access in rural areas through voucher schemes or subsidies, which otherwise may not be attractive for private service providers.

Private-sector institutions

Given the range of HRD activities in the postsecondary space, governments are faced with increasing demand, yet challenged by budgetary constraints. Consequently, they are unable to respond quickly and provide access to relevant and high-quality postsecondary education opportunities. Many countries, exclusively committed to public systems of education, have now adopted policies that allow and even encourage participation by the private sector in providing postsecondary education services. This disruption to traditional practices has its challenges. Some of these countries have been accustomed to highly centralized supply-side planning and thus are wary of demand-driven programs and competition from more agile private-sector providers. Therefore, they often unwittingly introduce legislation that is not conducive to improving and expanding private education. Increased access should be welcomed, but, given the wider variety of providers, it can be a risk to quality and can result in students investing a lot of money in poor-quality education and in skill mismatch, leading to unemployable skills. Private-sector education providers are often concentrated around urban areas, where there is potential for expanding their market share. This concentration of private providers may provide opportunities for some government investments to be targeted at disadvantaged communities.

Private-sector involvement in the postsecondary education space will neither cease nor slow down, given the current strong and continued demand. As noted earlier, Indonesia

has almost 4,000 private higher education institutions offering programs ranging from undergraduate diplomas to graduate and postgraduate degrees. In Central Asia and the Caucasus, Azerbaijan, and Uzbekistan are exploring ways to increase and improve partnerships with the private sector to help expand opportunities for postsecondary education.[17] Leveraging the private sector, including philanthropy, is increasing in Asia. Hong Kong University has successfully harnessed the support of its alumni and the private sector for infrastructure investments and recruitment of high-quality endowed professors. Armenia has leveraged its very successful diaspora to support education investment in not just the traditional system but also in innovative initiatives such as the Tumo Creative Technology Center, which supports skills development in creative industries and technology for disadvantaged out-of-school youth.[18]

The private sector can contribute in the postsecondary space either through traditional training institutional setups or integrated as part of a large private service delivery entity. In many Asia and the Pacific countries, the inability of governments to supply qualified human resources has encouraged private companies to develop their own in-house training institutions. For example, Tata Industries[19] in India has its own training colleges to prepare the workforce for its various operations. Programs range from TVET level to professional graduate qualifications. Similarly, Cisco Systems[20] has its own internationally recognized online training programs to prepare high-quality network technicians and engineers to support its information technology (IT) network products. These industry-offered programs are often certified by the industry and not by any postsecondary institution.

Cross-border providers

Apart from the growth in local private-sector involvement in the postsecondary space, there is also a growing trend of cross-border provision by international private- and public-sector institutions. Cross-border providers seek to gain a share of the growing market for postsecondary education in the Asia and Pacific region. The perceived value of cross-border education, particularly when the providers are from developed economies, and the increased labor force mobility in regional and global labor markets have encouraged internationally benchmarked programs offered by cross-border providers. Initially, cross-border providers were from OECD countries, but in recent years this has been changing. There are now a growing number of regional cross-border providers in higher education,

17 ADB. 2015. *Scoping Study for Development of Student Accommodation in Baku, Using the Public-Private Partnership (PPP) Delivery Model—Student Accommodation PPP in Azerbaijan.* Manila; ADB. 2015. *Rapid Assessment of the Technical and Vocational Education and Training System for Employment in Uzbekistan. Reports of ADB's Regional Technical Assistance Project: TA -8744: Education and Skills for Employment in Central and West Asia.* Manila.

18 https://www.tumo.org/

19 Tata operates universities (see http://www.tiss.edu/academics/schools-centres/), specialized technical training (see http://www.tatatechnologies.com/training/), and joint ventures such as the Nettur Technical Training foundation (see http://www.nttftrg.com/campuses/jamshedpur.php#).

20 The global online Cisco Networking Academy for network technicians; see https://www.netacad.com/

mostly concentrated in Southeast Asia.[21] However, the trend is expanding also in Central and West Asia.[22]

There is a need to develop and encourage regional networks to share knowledge and experiences regarding the changing postsecondary education space. While cross-border higher education provision has been extensively publicized, there is a similar trend emerging in TVET and CPD services. Some, like the Southern Alberta Institute of Technology's twinning partnership[23] with the Atyrau Oil and Gas Training Centre in Kazakhstan, have established international quality TVET programs with pathways toward degree-level programs. Such partnerships also provide customized CPD programs across a range of professional levels. Similarly, the earlier mentioned KOICA program to support TVET in Uzbekistan is a mix of government-to-government (bilateral) support and public-private partnership with Hyundai Motors for upgrading automotive training programs. For cross-border online delivery, the Cisco Networking Academy and Aptec [24] provide excellent examples. They both offer an interactive online platform that hosts nondegree but industry-recognized TVET and CPD programs. These may be offered either as stand-alones or as part of higher education (graduate) programs. Similarly, language learning centers run by international providers, catering to expanding call centers and growing numbers of foreign workers, are contributing to the literacy level of the workforce.

21 ADB. 2012. *Regional Cooperation and Cross-Border Collaboration in Higher Education in Asia. Ensuring that Everyone Wins.* Manila. Also see Huang, F. 2015. Internationalization in Asian Higher Education in the Era of Globalization. In R. Bhandari and A. Lefébure, eds. *Asia: The Next Higher Education Superpower?* Global Education Research Reports. New York: Institute of International Education and AIFS Foundation.

22 For example, the Kazakhstan-based Abiroy Technical Training has trained employees of oil and gas and energy companies in several countries. Since 2005 a total of 1,350 employees have been trained. See https://translate.google.com/translate?hl=en&sl=ru&u=http://www.abiroy.com/&prev=search

23 http://www.kasipkor.kz/

24 Cisco Networking Academy is a private company in the United States offering IT training services globally and having local and regional partners. Aptec is an Indian private company that is working in developing countries in Africa, Southeast Asia, and the Pacific; see http://www.aptech-education.com/

Pathways in Program Design

Structural issues

Amid changing employer and student expectations and the exponential increase in knowledge, the question of what knowledge, skills, and attitudes constitute the best option for the development of the future workforce is causing significant turmoil and disruptions. As noted by Chua and Chun (2016), if education and training programs are not well conceptualized and aligned with labor market analysis, there is a risk of a mismatch between a qualified workforce and actual demand. This mismatch has significant consequences for wages and employability (see Leuven and Oosterbeek, 2011). In places like Australia, the Republic of Korea, and the South Pacific islands, higher education graduates are seeking additional skills training to increase their employability. The unemployment trend among higher education graduates is also increasing in the People's Republic of China.[25]

The continuously evolving demand for postsecondary education is confounded by other externalities such as the total volume of available knowledge, the rate at which knowledge is changing, and the expectation of employers that employees will be job-ready. These disruptors warrant new ways to think about HRD programs, particularly as countries transition to a knowledge economy, where the change requires a shift in policy from "education for a job" to "education for work," which seeks a balance between self-directedness and responding to traditional prescriptive job tasks. Education services have traditionally catered to specific jobs that are shaped by externalities such as job types, employers' requirements, and market demands, whereas education for work gives individuals the flexibility to choose work they wish to do and the terms and conditions associated with that. Individuals may not want to work on everything associated with a certain job, but may be willing to work on specific aspects. It is more about the individuals' capabilities and their "intellectual property" rather the job requirements that earn remuneration. This approach resonates with the concept of portfolio and knowledge workers discussed earlier. Flexibility, choice, knowledge, and skills matched to individual's interests, continuous learning, and self-learning all challenge the traditional structures in the postsecondary education space.

[25] Approximately 10% of higher education graduates in the People's Republic of China are unemployed. See Chan, Wing Kit. 2015. Higher Education and Graduate Employment in China: Challenges for Sustainable Development. *Higher Education Policy.* 28 (1). pp. 35–53.

The historical debate regarding the purpose of education as being either general liberal education or vocational, preparing students for the world of work, which can be paid or self-employed, is still ongoing. Over the years this debate has resulted in various models of education provisioning. For instance, the German approach supports separate pathways for vocational and academic education from an early stage in the national education system, whereas countries like Australia and Canada include vocational education as an alternative pathway within secondary education, and students choose the TVET or academic pathway later, either in Grade 10 or in Grade 12. Now, we have a third approach, which often happens outside the formal system. This approach has been perpetuated by innovations in technology, the ubiquitous nature of human learning, and increased access to knowledge such that business and industry provide education services as after-sales value-adding to support a company's products. There are online chat groups leveraging the benefits of social networks, learning from each other, and self-learning by exploiting new opportunities such as increased access to knowledge products, ability to communicate with industry experts, and access to informal discussions on specialized industry-initiated chat groups.

While the German approach distinguishes between the academic and TVET pathways, both pathways progress to advanced degree-level programs—so they have a vertical continuum of applied technical knowledge and skills. This model is unlike other models, where either TVET is relegated to second-chance programs or it is assumed that TVET students are not suited to learn more complex knowledge and skills and thus have no pathway to higher levels of education. The second approach centers on structuring the postsecondary education space separately around TVET and higher education systems. Even though TVET is integrated in the secondary education programs in some DMCs to give students a taste of TVET career options, it fails to do so and, unfortunately, is not structured as a strong and respected pathway to higher education and training. Students wanting to change pathways often restart from the initial entry requirements, which has significant opportunity cost. The lack of flexibility in traditional education sector structures to allow students to move within and across an area of specialization works against the need for the workforce to be agile and able to rapidly acquire new knowledge and expertise as is required of portfolio workers in diversified contemporary labor markets.

The assumption that knowledge and skills are incompatible and should be separated is no longer relevant when the current demand at all levels is for "knowledge workers"[26]—workers who have knowledge and skills and can apply them in diverse contexts. Skills are a practical manifestation of knowledge; skills demonstrate how we use knowledge, so the two are inseparably connected (Fadel et al., 2015). Their convergence, through a virtuous cycle, helps knowledge to inform the innovation of new skills, and the skills help to create new knowledge. Seeking this convergence as a fundamental disruption at all levels of the education and training system challenges the traditional structural divide between TVET and higher education. However, this will require a comprehensive sector reform with significant and sustained commitment from government and labor market stakeholders.

The current time-bound structure of education and training programs may need review to accommodate increased knowledge; new employer expectations; and flexibility with multiple entry points, pathways, and exit options. Programs have to be flexible to

[26] Sarvi, J. and Pillay, H. 2015a. *Innovations in Knowledge and Learning for Competitive Higher Education in Asia and the Pacific.* Manila: Asian Development Bank.

accommodate new knowledge and practices, without having to go through protracted approval and audit processes. Public-sector training institutions are often disadvantaged by ponderous bureaucratic structures and procedures, whereas private-sector institutions are more agile in responding to changing market demands. A modularized program design covering the vertical continuum of the NQF is an option allowing learners to self-select subjects and courses—a mix of TVET and higher education programs. Some proactive higher education institutions have recognized the opportunity and provide "bespoke" courses to satisfy individual needs.[27]

Another option for accommodating increased knowledge and industry expectations is influenced by new understandings of situated versus abstract theoretical knowledge and learning. These understandings have contributed to the growth of "work-integrated learning," wherein students engage with both professional practice knowledge and academic knowledge. For example, partnerships with workplaces are inherent in the structure of most master of business administration (MBA) programs and of many engineering and medical degree programs. The apprenticeship model in TVET programs perhaps illustrates this well. The next stage of disruption facilitating the shift of the learning experience away from the traditional physical space of institutions is a hybrid model wherein different permutations of the traditional approaches are combined with online and site-based access to knowledge and learning to better utilize students' time.[28] Training programs designed to cater to these innovations require different structures to help participants develop the required capabilities. Research (Barker et al., 2014) suggests that more personal control of one's learning provides strong motivation for and positive impact on an individual's learning outcomes. However, introducing this personal control needs to be done in phases, as it is a significant shift from traditional practice, where highly structured programs adopt teacher-directed learning. Thus it will require significant capacity development and increased adoption of a blended approach, mixing with other forms of learning experiences to encourage the transition to self-directed learning.

The increasing recognition of ubiquitous access to knowledge and diversified learning opportunities, and acceptance of other forms of knowledge and skills, are disrupting the traditional bipartite or tripartite education and training structure that has separate ministries for school education (i.e., primary and secondary education), TVET, and higher education and, thus, is not conducive to the alignment of pathways and hinders effective planning of HRD systems. Also, despite the ministry of education being the main line ministry to support national HRD, there are, in some countries, training institutions aligned to other line ministries.[29] Often these institutions within other ministries operate with little coordination or QA. As noted above, an NQF is one mechanism that may help provide a structural framework to capture and articulate the types of knowledge and skills required at different levels within and across sectors and disciplines when individuals are seeking to retrain for emerging and future jobs. A system is needed with structures that encourage

[27] Bespoke courses are customized by the students as per their needs. See https://www.une.edu.au/bespokecourses

[28] Most students these days, irrespective of initial or CPD training, have a job—they are part-time students. Increased demand and the shrinking public budget for education require students to seek some form of employment to support themselves. The opportunity cost is increasingly becoming a major consideration when individuals invest in education and training.

[29] Specialized universities such as the Azerbaijan State University of Economics and Tashkent State Agrarian University have their strengths but can be limited in innovation, something that happens at the boundaries of discipline areas—cross-discipline research and teaching underpin the strength of comprehensive universities.

individuals to freely enroll in single modules or whole training programs, progress upwards or downwards[30] on the NQF continuum, and/or move sideways to new areas, without encountering rent-seeking behaviour.

Content issues

A significant disruption is happening to what is considered appropriate knowledge and skills. There is a shift from a predetermined fixed repository of knowledge found in formal education and training programs, to students' self-determination of what needs to be learned and opportunities for them to access multiple repositories of knowledge—including industry and traditional nonformal repositories. The increased access and student self-determinism require more flexibility in program design to give more space for exploratory learning and self-development. This flexibility also applies to how and what we understand as learning outcomes. The content of traditional education and training systems emphasizes memory recall and complex mathematical computations underpinned by routine algorithms, instead of meaning-making in a real-world context, solving authentic and novel problems, thinking outside the box, and applying knowledge and skills in new and innovative ways. These latter capabilities are underpinned by applying cognitive skills, such as inductive and deductive reasoning, and being able to make logical inferences. Research on novice-to-expert capacity development emphasizes the ability to extract principles from discipline knowledge and make inferences, to use deductive and inductive logic to analyze, and to develop integrated schemas linking across disciplines and contexts to create new meanings and understandings—i.e., the ability to see beyond the physical artefacts. The current overloaded discipline content cannot develop the above attributes, hence the increasing call to balance the mix of various knowledge types such as hard discipline knowledge, communicative and analytical knowledge, and soft skills (McKinsey Global Institute, 2012).

Recognition of changing learner expectations is the antithesis of the current supply-side model, where in higher education, for example, professors and universities serve as the custodians of knowledge and determine course content.[31] However, cognizant of the above-noted structural disruptions, future course designs will increasingly be influenced by industry, professional communities, and individual learners. The disruptions will continuously seek new equilibriums with regards to acceptance of (i) other knowledge types (indigenous and traditional, and new emerging disciplines such as green knowledge and skills that impact on energy, building, and infrastructure design, and city planning focusing on connected, green, and liveable cities); (ii) new and more meaningful understandings of human learning (beyond the usual plethora of faddish learning theories); and (iii) new expectations from formal learning (job-ready graduates, graduates as knowledge innovators).

[30] As noted previously, in some countries increasing graduate unemployment has seen graduates taking up more skills-based courses to supplement their degrees and increase their employability.

[31] Sarvi, J. and Pillay, H. 2015a. *Innovations in Knowledge and Learning for Competitive Higher Education in Asia and the Pacific.* Manila: Asian Development Bank.

Considering the complex, constant, and multifaceted nature of these disruptions, the content of formal education and training programs is likely to change rapidly. This change presents a dilemma for education program designers in determining what to include in a formal program and what to leave out, perhaps to get picked up by CPD programs or nonformal learning. The change challenges program content designers regarding how to separate requisite knowledge and skills for preservice programs and CPD (self-directed and lifelong learning), assuming there is still a level of temporal stability regarding what constitutes discipline areas. This dilemma is not new, because formal courses have always focused on the core and necessary elective requisite in a discipline area. What is seriously disrupting program content is the volume of available information in every discipline area or professional practice, which is growing at unprecedented rates. Yet the timeline for education and training programs remains the same and may no longer be sufficient. As noted by Wilson, "We are drowning in information, while starving for wisdom. The world henceforth will be run by synthesizers, people able to put together the right information at the right time, think critically about it, and make important choices wisely."[32] The information overload can be evidenced in program content at all levels of the education system. How to package this increased knowledge in existing time-bound university programs[33] needs innovative thinking to ensure that essential core knowledge is not diluted, while new knowledge types are appropriately accommodated.

While there is growing recognition of potential structural and content disruptions, the inertia of traditional practice and the political economy of the past era are perhaps the biggest obstacles to modernizing postsecondary education. As a consequence, little analytical work has been encouraged to consider ways to implement a coherent reform across the postsecondary landscape. Large-scale disruptions can be overwhelming, particularly for countries coming out of highly structured and demarcated supply-side planning. In such cases, which applies to the majority of the DMCs, strategically staged interventions to address disruptions in a planned and cumulative manner may be an option. In attempting to synthesize[34] this challenge, the United Nations Educational, Scientific and Cultural Organization found that typologies for program content are just as diverse as their respective countries, levels of education, and types of program. Nevertheless, the synthesis provides a starting point to rethink what should be the content of education programs for the future. Mechanisms to support dialogue across education subsectors and in the postsecondary space and across line ministries can help consolidate and improve the effectiveness of investments in national HRD. Contemporary discussions on innovations in human capacity development argue for the importance of higher education programs to focus on producing graduates with attributes that allow them to be more innovative and entrepreneurial to deal with continuously evolving employment and business opportunities.[35] This employment landscape requires new frames of reference—education for the world of work as opposed to education for a job market.

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32 E.O. Wilson. 1999. *Consilience: The Unity of Knowledge.* New York: Vintage, p. 294.

33 Council of Europe. 1997. *Convention on the Recognition of Qualifications Concerning Higher Education in the European Region.* Lisbon. Also known as the Lisbon Recognition Convention. Accessed on 11 April 1997 at http://conventions.coe.int/Treaty/EN/Treaties/Html/165.htm

34 http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/

35 ADB. 2014. *Creative Productivity Index: Analyzing Creativity and Innovation in Asia.* Manila.

Preservice vs continuous professional development

The increased access to vast knowledge repositories, continuously changing work opportunities, increased expectations of employers, and the bounded timelines for preservice education suggest that such training will never be able to meet all expectations: thus the need for a serious review of CPD to take advantage of it as a mechanism to support continuous upgrading of knowledge and skills. Many professions in the West, in light of the continuous growth in knowledge innovations, require members to annually upgrade their knowledge and skills by taking mandated hours of CPD. However, CPD has unfortunately not been seen as an important aspect of HRD in many DMCs, yet is expected to become a key aspect of future HRD. Pillay and Ninan (2014) note that countries such as Germany, Japan, and the Republic of Korea have grown their economies on the back of a well-developed vocational sector that invests heavily in CPD, compared with most South and Central Asian countries. In many DMCs, in-service training, particularly in teacher education, is often used to compensate for the poor quality of preservice training and is thus confused with CPD. Formal CPD, as a means of maintaining the currency of professional knowledge, presents a possible option for addressing the continuous and exponential growth in knowledge.

Delivery Modalities and Challenges

Traditional institution-based face-to-face

Significant public investments have been made in infrastructure during an era when face-to-face, institution-based delivery has been the only approach. Infrastructure investment may still be necessary, but perhaps less critical. Also, the types of infrastructure required may be very different.[36] Traditional models of large infrastructure investments in campus facilities are being reviewed against value-for-money and the emergence of alternative delivery modalities. In recent years, many high-achieving postsecondary institutions (particularly higher education institutions) have invested heavily in new buildings, more for symbolism and prestige than for enhanced learning outcomes or increased access. There will always be a need for a certain level of infrastructure to provide a high-quality learning environment—this level depends on the human capital development needs of particular DMCs and should evolve in tandem with economic growth and related labor market evolution of the respective countries. Nevertheless, caution is recommended because of the arrival of new stakeholders and innovations in delivery modalities such as work-integrated learning and the technology-based delivery of education services.

Traditional public-sector education institutions need to balance the need for additional infrastructure and adopting novel ways of optimizing the use of existing facilities, particularly in light of the rapidly increasing availability and adoption of alternative delivery modalities. The use of satellite campuses, both locally and off-shore, to increase access requires different conceptualization of university facilities. The use of affiliate colleges or the franchise model is not new to the Asia region. More recently, the establishment of transnational programs has resulted in improved cost-efficiency, as they avoid duplicating the resources that are already available at international partner institutions. This opportunity has contributed to the increase in twinning arrangements, where partner institutions can jointly leverage each other's infrastructure and physical resources.

Infrastructure expansion is often justified by arguing for increased access, improved learning environment, or both. However, increasing access is often associated with increasing market shares, which may be purely commercial and have little to do with equitable access. Typically, most education and training facilities (public, private, or transnational) are established around urban centers, which can limit access for rural and

[36] ADB. 2011. *Report and Recommendation of the President for a Proposed Loan to the Socialist Republic of Viet Nam: University of Science and Technology of Hanoi Development (New Model University) Project.* Manila.

remote students. The success of increasing access via online provision is often overrated, particularly when in many developing countries there is limited connectivity in rural areas. Independent International Telecommunication Union data[37] show that many DMCs have limited connectivity outside of the main urban centers. Establishing public- and private-sector affiliate colleges in rural areas can bring quality education opportunities there; however, they need to be carefully managed without compromising quality—something that has been a challenge. In addition to quality, relevance of education outcomes and skills in postsecondary education is important; thus education institutions in rural areas and provincial cities need to be more integrated with local economies and labor markets.[38] Staffing constraints, plus lack of modern facilities, are often cited as barriers to providing high-quality education services to rural communities; thus integrated service for TVET and higher education in rural areas can help develop sustainable models of high-quality programs and services due to accrued benefits from economies of scale. Adopting the postsecondary education space as a continuum allows sharing facilities, such as common libraries, laboratories, and teaching spaces. Increasingly, part-time students, who often have daytime employment, are becoming a significant part of the student population because of opportunity cost. Therefore, education institutions have to accommodate their needs and offer flexible programs running until late in the night—the 8:00 a.m. to 5:00 p.m. timetable for provision of education services may no longer be appropriate.

Online and hybrid modality

As noted elsewhere in this paper, the evolution of the new education and training delivery modalities has caused much disruption. The ICT innovation continues to significantly enhance not only external programs, but also on-campus teaching and learning.[39] E-libraries, open access resources, open access journals, etc., have changed the physical design and purpose of facilities such as libraries, lecture rooms, and on-campus learning hubs, which in turn can significantly change the student learning experience. Just like maximizing the utilization of physical infrastructure by adopting an integrated approach to postsecondary education services, investments in ICT can also help leverage delivery options through economies of scale. A robust education network can be shared by TVET, higher education, and other stakeholders. Increased bandwidth, reduced costs, and an expanded client base make ICT investment sustainable. The economies of scale are particularly beneficial for smaller DMCs, where a dedicated education network for each level of the postsecondary education system may not be sustainable.

The other significant disruption in delivery of education services is increased partnerships with industry and/or nontraditional education organizations. While these partnerships are sometimes seen as cost-cutting measures, they do have the potential to enhance learning outcomes and increase access. Engagement with external partners such as industry

[37] http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx
[38] ADB. 2012. *Improving Transitions. From School to University to Workplace.* Manila.
[39] Sarvi, J. and Pillay, H. 2015b. *Integrated Information and Communication Technology Strategies for Competitive Higher Education in Asia and the Pacific.* Manila: Asian Development Bank.

to support knowledge creation may be achieved through knowledge incubators[40] and work-integrated learning. As the recognition of field expertise increases,[41] nontraditional partnerships may be seen at all levels of the postsecondary education space. Working with real-world people, through partnerships, helps build experience and apply knowledge meaningfully to benefit all humankind, e.g., through situated learning, authentic projects, problem-based learning, and cross-discipline development activities and across education levels (TVET, polytechnic, and university). Having partnerships that cover multiple levels of the postsecondary space can help support career pathways. For example, the Queensland Mineral and Energy Academy[42] in Australia brokers partnerships with mining and energy companies that support programs ranging from apprenticeships to university degrees.

The disruption in postsecondary human capacity development is stimulated by the need to focus more on increasing access to education opportunities, on new and increasing knowledge types, on student learning outcomes, and on the opportunities to accelerate and improve learning to support the national socioeconomic growth and cultural development of DMCs. The human resource capacity needs of countries transitioning to knowledge economies cannot be determined by using lenses derived from the industrial revolution or the information age. Therefore, any comprehensive analysis of demand and access to education and training, and of student learning outcomes, should also include revisiting the fundamentals of HRD to improve how education and training are organized to respond to emerging disruption.

[40] Incubators were initially set up to provide services that help start-up companies get through initial hurdles in transforming research ideas into marketable products and business enterprises. Traditionally, incubators were attached to higher education institutions. However, due to the recognition of the importance of intellectual capital and knowledge innovations happening in industries, this trend is now shifting, and incubators are increasingly attached to industry—encouraging higher education institutions to establish partnerships to use industry facilities.

[41] S. Joonghae and H.C. Chen, eds. 2007. *Korea as a Knowledge Economy: Evolutionary Process and Lessons Learned.* Korea Development Institute and the World Bank Institute, August 2007.

[42] http://www.qmea.org.au/ Queensland Mineral and Energy Academy is an industry-led initiative opening pathways for secondary students to get involved in trade and engineering careers.

Final Remarks

The ubiquity of knowledge and learning, confounded by the need to shift from a highly structured industrial model of human capacity development to a more open, contingent, and purpose-driven approach, mediated by self-directed capacity, is disrupting how we conceptualize and deliver education services in the postsecondary space. The exponential growth and continuous innovations in new knowledge, and the increased demand, triggered by the growing middle class in the Asia region, may not be fully served through traditional linear and time-bound structures and program designs. As noted earlier in this report, some blurring of traditional structures has started, which will continue to increase. What constitutes foundational knowledge that can help individuals to continuously build, change, and adapt, and what may be considered as continuous professional development, need to be reviewed. At a time of high levels of uncertainty about what is the most appropriate and effective education model amid the risk of rapid knowledge obsolescence, the ability to be a self-directed learner will be a key capacity. Increasingly, learning how to research new information, to synthesize the same using cognitive processes such as deductive and inductive logic, to discern underlying principles, to engage in creative problem solving, and to learn how to learn is a key human resource capability for a creative and competitive workforce.

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Innovations in Knowledge and Learning

Postsecondary Education Reform to Support Employment and Inclusive Growth

To meet modern-day challenges of improving quality and relevance, responding to new knowledge, and strengthening teaching and learning, the postsecondary education space must revise system structures, content designs, and delivery strategies, i.e., engage in disruptive thinking. Governments need to implement effective regulatory processes to ensure quality and equitable access by all students. Education programs must be in sync with workplace needs and built around "knowledge clusters" rather than specialized fields. Diverse and multiple disruptions will become the norm.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to a large share of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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