THE FOURTH INDUSTRIAL REVOLUTION: CHALLENGES FOR DEVELOPING COUNTRIES STRATEGIC LEADERSHIP

Skills development for supporting sustainable economic growth in Mongolia

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It is hard to see what has never been.

Abstract

Within the context of modern Official Development Assistance (ODA), skills development is increasingly the focus of investments in the education sector. Historically, ODA for education sector development focused on Basic Education (Grades K-9). Since 2005, there has been a shift in ODA thinking with a focus on capacity development and workforce development as underpinning support for economic development. Official development assistance is defined as government aid designed to promote the economic development and welfare of developing countries.

Development assistance may be provided bilaterally, from donor to recipient, or channelled through a multilateral development agency such as the United Nations or World Bank. Skills development makes a logical fit as the benefits concern economic development and citizen welfare. Skills development programs make sense to donors as it breaks down barriers of separate sectors and enables bilateral and multilateral agencies to have a lens for financing education as an intersectoral investment with many benefitting government Ministries.

Mongolia has long benefitted from ODA and education sector support has been a strong focus. Around 2008, both donors and the private sector examined provisions for technical and vocational education and training (TVET) and concluded that if Mongolia was going to experience sustained economic growth, chronic skill shortages needed to be addressed. The Asian Development Bank (ADB) quickly grasped the importance of skills development and soon measures were in place for a comprehensive program in skills development for employment covering priority economic sectors and industries.

This paper examines prospects for knowledge and skills development in Mongolia's higher education sector. It will ask what needs to take place for universities to develop advanced skills and in nurturing innovation and entrepreneurship utilizing transformative technologies like cloud computing, internet of things (IoT), machine learning, and robotics. The paper explores what universities will need to do to convince faculty of the importance of increasing university graduate employability. This involves upskilling to meet new labour market demands, and increasing employability of both

undergraduates and postgraduates to ensure equitable development. There is also scope for exploring means for strengthening innovation capacity.

Key words: higher education reform, 4IR, advanced knowledge and skills development, employability, transformative technology, Mongolia

Introduction

Recently, the 'world view' of skills development for bilateral donors and multilateral development agencies, has transitioned and matured. Skills development is now captured by support for Knowledge and Skills Development[1] as the underpinning framework for sustainable economic growth. Knowledge and Skills Development has taken TVET out of school education and placed it within higher education to ensure that a higher education results in work ready graduates who are employable. ODA support in this area is often directed to a nation's higher education system by providing advanced knowledge and skills to support inclusive and sustainable economic growth. Typically, it aims to upgrade targeted universities with the aim of improving access to, and the quality and relevance of university-led education and research.

The impact of this ODA is greatly improved employability of graduates, and increased income and productivity of the working age population. Advanced Knowledge and Skills Development takes place within the context of a *present reality* and *preferred future*. The gaps in many developing countries between current reality and preferred future are enormous and the challenges for advanced knowledge and skills development that will bring the future closer, are significant and substantial.

Traditionally, TVET is about strengthened relevance and quality of school education and that of TVET institutions such as Polytechnics. Relevance concerns market responsive curriculum programs, and the provision of university TVET including the quality improvement of university faculty. Knowledge and Skills Development, in its purist form concerns supporting the development of a communications and knowledge management strategy to share knowledge and disseminate information about the progress and results of this new approach to TVET enabling a wider quantum of work ready graduates. This involves training faculty on a communications and knowledge management strategy and social media development and management.

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[1] Andy Hargreaves & Paul Shaw. (2006). Knowledge and Skill Development in Developing and Transitional Economies. An analysis of the World Bank/DfID Knowledge and Skills for the Modern Economy Project, The World Bank.

Reforming the higher education sector in Mongolia

What changes need to occur with the higher education system for the Fourth Industrial Revolution? Pinning down change requires defining the current situation. What needs to be undertaken as a first step for strengthening the higher education sector is a rapid assessment of institutional arrangements and capacity for the higher education sector in terms of organizational structure and functions, staffing, financing, and staff qualifications, competencies and experience. This can lay a foundation for development of medium-term higher education investment plan. But for the 21st century, skills development is fundamentally different. This is an initiative that is normally conducted by development assistance partners. In Mongolia this involves:

- a review of laws, regulations, policies, plans, assessments, and evaluations related to the higher education sector since 2010
- collecting information on future investment plans and projects of development partners in the higher education sector
- identifying and assessing external factors likely to influence change in the sector (e.g., demographics, industry engagement and the introduction of new technologies)
- reviewing the international environment in which Mongolia's higher education system operates including institutional linkages with Japan, South Korea and Germany
- the benchmarking of the system against relevant international and regional comparators and higher education systems, processes
- preparation of a strategic plan with an emphasis on advanced skills, innovation, entrepreneurship, and external factors to which the sector needs to respond
- detailing out a strategy for policy changes required to support achievement of higher education reforms including the changes required
- a review of current resources, the potential for rationalization to maximize the use of these resources, and identifying how any additional resource requirements can be met, and
- a specific plan for investment in individual higher education institutions.

Higher education reform has been high on the government's agenda for strengthening the economy. This agenda has been supported by the World Bank and Asian Development Bank. The reform agenda has not involved a rationalization of the higher education system which is common in high-income economies. Higher education in Mongolia consists of the core publicly owned national universities which have been in existence for decades and a plethora of privately-owned universities which have prospered in an unregulated environment. uniRank (www.4icu.org/mn/) has published the **2019 Mongolian University Ranking** of 65 recognized

Mongolian higher-education institutions. These 65 higher education institutions must meet uniRank selection criteria by:

being chartered, licensed and/or accredited by the appropriate Mongolian higher education-related organization

offering at least 4-year undergraduate degrees (bachelor degrees) or postgraduate degrees (master or doctoral degrees), and

delivering courses predominantly in a traditional, face-to-face, non-distance education format.

uniRank aims to provide a non-academic *League Table* of the top Mongolian universities based on valid, unbiased and non-influenceable web metrics provided by independent web intelligence sources rather than data submitted by the universities themselves.

According to uniRank, Mongolia's top universities are the:

- National University of Mongolia
- Mongolian University of Science and Technology
- Mongolian University of Life Sciences
- Khovd University
- Mongolian National University of Education
- University of Finance and Economics
- Mongolian National University of Medical Sciences
- Ikh Zasag University
- University of the Humanities, and
- Mongolia International University.

This ranking is not an academic based taxonomy as it draws on web metrics but for those familiar with Mongolia's higher education system the ranking is logical and consistent.

The **Mongolia Sustainable Development Vision 2030** which sets out ambitious objectives and outcomes in support of Mongolia realising middle income status, has very measured expectations of the higher education system. It aims to '*Advance the tertiary education system to meet sustainable development goals, and improve the lifelong education system.*' This is a modest outlook as a key platform of the Vision 2030 is '*Human development must be the core measure for development.*' In contrast, aspirations for the contribution from TVET are robust and grounded. They include:

- improve the vocational education and training system in conjunction with development priorities, and equip graduates with strong professional skills.
- support employment, train the younger generation with proper knowledge and skills to have decent work and run a private business, and reduce the unemployment rate.

- promote employment, raise the working-age population's economic activeness to 70%, reduce the unemployment rate to 6% in the laborforce, impart skills and vocational training to the workforce including youth based on labor market demand in agriculture, industry, services and infrastructure projects, and
- improve registration and updates on informal jobs, and increase small and medium enterprise support fund to at least 100 billion tugrik.

These objectives and aspirations reflect the government's concerns about high unemployment in a context of chronic skill shortages, widespread poverty and the lack of work readiness amongst school graduates and university graduates.

It is of interest that the government's focus on TVET and skills development is not reflected in the vision for higher education. But what is also of interest is an aspiration for the higher education system to match '*international standards built on a* **training-research-industry** *cooperation model, which provides equal, inclusive and quality tertiary educational services*.'[2] This outlook concerns a higher education system that is driven by research and industry engagement. In its simplest form industry engagement is based on a model where a university's training and assessment practices are relevant to the needs of industry. This involves a university implementing a range of strategies for industry engagement and systematically using the outcome of that industry engagement to ensure the industry relevance of:

- its training and assessment strategies, practices and resources, and
- the current industry skills of its trainers and assessors.

The process of industry engagement for universities involves the preparation of work ready graduates and according to definition provided above that these graduates have been trained by faculty who have solid industry skills and disciplines. Does the higher education system of Mongolia have these characteristics?

In a study on higher education conducted in 2010, some key weaknesses of Mongolian universities included:

- there is no mechanism for social responsibility of higher education institutions. Although the number of graduates from universities has increased, graduates face difficulties in finding work and meeting the requirements of workplaces set up by the employers, and
- market research on higher education has not been conducted and there is no partnership mechanism with the employers. As a result, there is an imbalance between demands from the workplace and the supply of the specialists. Moreover, the number of graduates from universities exceeds the vacancies available for them in a labor market.[3]

[2] Mongolia Sustainable Development Vision 2030, p.28.

[3] Udval Natsag. (2010) Mongolia: Strengthening Higher and Vocational Education Project: Roadmap for

Historically, the Government of Mongolia has considered reforming higher education as a major instrument to accelerate economic growth. As can be seen from Vision 2030, the government has aspirations for a higher education system meeting international standards, by having graduates who can successfully compete in an increasingly globally oriented economy. This aspiration is based on the expectation of high returns for the extractive sector which will provide Mongolia with resources for further economic development. It has been recognised that without a well-developed higher education system, the country's youth will not be able to compete globally and the economy will remain narrowly based.

Higher education challenges and the 4th Industrial Revolution

What changes need to occur with the higher education system for the Fourth Industrial Revolution (4IR)? The purpose of higher education has remained remarkably constant for the last 600 years since the founding of the earliest universities of Bologna, Oxford, and Cambridge. The purpose of a university education is to prepare young people for professional work and to help them understand how to be effective citizens. Currently, the range of jobs reflects the high complexity of modern economy and as the labour market transitions quickly, it is difficult for universities to respond effectively to rapid transitions in skill requirements.

Historically, universities have viewed skill development in terms of students/graduates having the skills to think critically, to solve complex problems, and to write fluently and/or critically. These are considered fundamental to success in work and in making and executing the many decisions that constitute how a person lives. But for the 21st century and the 4IR, skills development is fundamentally different.

To illustrate, in 2018, the Ministry of Skills Development and Entrepreneurship, India, put in place mechanisms for setting up Skills Universities. The Ministry recognised that presently

India faces a skill demand-supply mismatch, as the economy needs a more 'skilled' workforce … the majority of the contemporary institutions of higher learning are disconnected with the requirements of employers. Skill oriented courses available in the country on the average, have low credibility and acceptability with employers.[4]

The vision for Skills Universities involves a clear mandate for skills education to create a parallel vocational counterpart to general education. The Guidelines for setting up these universities advise that higher education should offer practical real-world training in the industrial and services sector [by putting in place an] employer linkage as the primary driver of skills education which will lay the foundation for a

Higher Education, Asian Development Bank, Ulaanbaatar, Mongolia.

[4] Ministry of Skills Development and Entrepreneurship. (2018). Guidelines for Skills Universities in India https://www.msde.gov.in/assets/images/announcements/180925_Skills%20University_Guidelines.pdf

successful skills training system in the country. Such universities shall cater to the national and international job markets across sectors. Through such a network of Skills Universities, skills-based education will acquire aspirational values and social acceptability in society and the economy. Skills Universities will fill the long pending need for higher level institutions in the skills space and help harvest latent value in India's existing skills landscape.

Mongolian universities also experience a disconnect between courses offered and employer expectations of graduates. The aim for Skills Universities is to diversify approaches to learning including (i) online/blended/flexible learning, (ii) recognition of prior learning, (iii) competency-based learning drawing on modular courses (e.g., Training Packages) (iv) credit transfer across courses/programs to enable continuous learning, and (v) on-the-job training. The aim is to prepare work ready graduates consisting of competent, skilled and capable youth imbued with skills, learning and the spirit of entrepreneurship to meet the world-wide demand for a skilled workforce.

These bold aspirations have yet to be fully tested as much will need to be put in place to enable the operations of these universities including a robust regulatory and legislative framework enabling closer university-industry education and training planning. The success of Skills Universities will necessarily involve robust industry engagement. Globally, leading universities consider skills development as academic writing and communication skills. Student access to academic skills is often by means of online platforms requiring self-study. Skills development in terms of competency-based training has yet to be mainstreamed into academic programs.

This development is timely as recent research on employment advises as employment relationships increasingly shift towards temporary and freelancing arrangements, how can we ensure that individuals receive the support and guidance they need to acquire the right skills throughout their working lives? As employers are deconstructing traditional job roles and re-bundling work tasks in response to new technologies, how can they minimize the risks and best leverage new partnerships with resources such as online freelancers and talent platforms? And how can they best ensure such task rebundling does not inadvertently lead to new forms of job polarization through 'task segregation', whereby specific groups of workers are disproportionately allocated the most or least rewarding work tasks.[5]

Throughout Mongolia, there are ample opportunities for universities to engage with employer groups to secure a better understanding of employer expectations of graduates as future employees. The German-Mongolia Institute for Resources and Technology (GMIT) provides a relevant model. The Rector of the Institute

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

advises that

GMIT is a dynamic Campus University where students learn, analyse, create, and experience the excitement to transform the world as we know it. At GMIT, we envision the future where industries, from extraction of minerals to manufacturing of goods to logistics, are guided by advancement of technologies such as autonomous systems and big data mining. Consequently, we train our graduates to be not only highly qualified engineers, but also successful leaders of tomorrow.[6]

GMIT is at an advantage in that the courses it delivers cover a range of engineering disciplines in a context where engineering education is scarce within the higher education system. The narrow range of courses makes it easier to share resources and faculty across courses. It also enables natural industry engagement as the employers of engineers are specific about the range of disciplines they require now and in the future.

According to this model, skills development in Mongolia's 10-leading universities will require a rationalisation of course offerings as a first step. This is a challenge as reducing the number of courses puts faculty jobs at risk. The other challenge is to consider bringing the 10-leading universities into a consortium to plan for sharing resources and research expertise. There are models for doing this such as the Group of Eight in Australia. The Group of Eight is a coalition of world-leading research-intensive Australian universities. These universities are some of the largest and the oldest universities in Australia and are consistently the highest ranked of all Australian universities. The Group recently hosted a forum on Graduate Employability in Shanghai. The point of interest is that all eight universities contributed to this forum and that the focus was on employability.

Conclusion

This paper is largely exploratory and has been prepared as a basis for discussions on how the collective strengths of Mongolia's leading universities can be brought together as a consortium to work on introducing knowledge and skill development across the relevant undergraduate courses. Collectively, they can meet with employers to pin where universities are failing meet labour demand in priority industries and sectors. There continues to be shortage of qualified graduates to meet the demand for the various engineering disciplines and this can be best met by the universities collectively working on a response to meet unmet demand.

The skill development agenda in Mongolia remains a high priority for the government given its concerns about unemployment and skill shortages. There

[6] www.gmit.edu.mn

is scope for Mongolia's universities to bring the skills development agenda into mainstream higher education. Competency-based learning does require significant changes to the student learning experience and student assessment. But it is timely for flexible approaches to learning to be taken on board for university courses that lead to high employability. There is a social responsibility for universities to respond to Mongolia's skill shortages as whilst that situation continues the university contribution to the knowledge economy and economic development is lacking.

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[3] http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf

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