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Can Vietnam's Higher Education System Prepare Students for 21st Century Global Competitiveness?

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Abstract

The purpose of this paper is to provide a critical analysis of the current state of affairs of the higher education system in Vietnam. This paper will also explore how the quest for a high-quality higher education system is imperative and elusive for Vietnam's continued growth. The traditional or narrative literature review was utilized in order to provide a comprehensive background of the current state of affairs seen in Vietnam. The research incorporated some additional personal field research gathered by the researchers during their visit(s) to Vietnam. The research approach is more qualitative in nature. The Vietnamese economy has changed drastically over the years, and the educational system has been changing to adapt to the needs of the market. While the education system is moving in the right direction, the pace of change seems to be slow. Vietnam's educational system is aligning with the standards of ASEAN network, making the educational system recognized externally as having a high-quality program. COVID-19 occurred during this study, which likely hindered some of the outcomes of this study. The paper enhances the knowledge surrounding the importance of preparing students for the 21st century. The analysis presented in the paper can be used for those decision makers around the world that are concerned with quality assurance and implementation. The lessons experienced by Vietnam can be used as an insight of what to expect for other countries around the world considering to adopt similar quality assurance programs.

Keywords: Fourth Industrial Revolution, Quality Assurance, Vietnam Corruption, Vietnam Economy, Vietnam Higher Education

Introduction

It is not difficult to find significant research opining about the bleak state-of-affairs of higher education in Vietnam. The litany is significant and jarring: corruption, burgeoning skills gap of graduates, lack of resources, sub-par research endeavors, brain drain, degree mills, lack of authentic accrediting processes and bodies, etc. Of greater note is the fact that this list of higher education maladies has changed little over the past several decades. Yet, from all evidence the country's dazzling economic growth and commitment to bolstering its higher education sector over the past 30 years has produced stunning results. Support for this claim is bountiful when considering its extraordinary GDP growth, move to lower middle-income status, escalating foreign direct investment (FDI), free trade agreement network, government commitment to growth, and young and growing work force.

Concomitant with this upward trajectory, the lofty responsibility of education as both revenue generator and contributor to the common good has intensified. Proving academic quality is essential for higher education institution's (HEIs) while control processes/procedures must be confirmatory. Seemingly intractable barriers concerning governance, paucity of high-quality faculty and research systems, graduates' underemployment, and shrinking resources present formidable challenges to strategically and sustainably prepare for the future. It is the implicit duty and mission of higher education institutions to provide quality, career ready graduates to help foster this socio-economic development of the country and further the common good. Throughout Vietnam this proposition does not come without challenges due to external factors impacting the entire higher education "industry"; such as the massification and internationalization of higher education, breakneck technological change, disparate stakeholder needs, student passivity, full transparency, heightened accountability, Industry 4.0, and altered competitive landscapes. Unique internal environmental features include HEIs' wide-ranging level of maturity regarding quality assurance processes, fragile tensions between government/accrediting agencies/HEIs, institutional autonomy, laws and regulations, corruption, lack of resources, impractical curriculum and teaching pedagogy, R&D investment, scholarship rigor, and cultural nuances.

This paper will explore this dichotomy utilizing field/scholarly research and qualitative investigation. Specifically, how can Vietnam's economic engine continue to dazzle whilst its HEIs' processes, systems, infrastructure, and outputs hobble forward through the decades? Can Vietnam continue its current trajectory on its own clock? Or does the country need to recognize and capitalize on the vital role that can be played by global best practices in facilitating its endeavors to enhance quality higher education? This study will also explore how this quest for quality higher education is both imperative and elusive. Specifically concentrating on leveraging proven quality enhancement procedures, action-oriented strategies to raise the quality bar for Vietnamese HEIs will be assessed. The greatest challenge may be the ability of the Vietnamese government and HEIs to minimize and/or eliminate the internal roadblocks preventing the implementation of global quality initiatives to ensure success.

Methodology

A qualitative case investigation was used in order to gather data surrounding Vietnam's state of affairs in its higher education. A case investigation was chosen because the authors were able to visit Vietnam in order to either directly observe and/or interact with the higher education community. A traditional or narrative review of the literature was completed in order to gain a better understanding of the conditions in Vietnam. Following the general literature review path provided the researchers with the most important aspects of the current state of affairs in Vietnam. In order to further understand the Vietnamese higher education in more detail, personal field research was conducted during the authors visit(s) to Vietnam. One researcher spent several months in Vietnam as a full bright scholar. The authors were able to speak with faculty members, university department heads, higher administration personnel, and/or authoritative figures within Vietnam. These individuals were chosen because they would have firsthand insight upon the higher education system within Vietnam. A field research was used in order to gather real-life background to provide meaningful evidence as to the parameters within the higher education system in Vietnam. Field research allowed the researchers to confirm and clarify the facts found within the traditional or narrative review of literature. The researchers are very appreciative of the time, assistance, and hospitality during their visit(s) in Vietnam. The researchers learned so much from each meeting and conversation. The data is papered in a research journal and is supported with the literature review in order to validate the research findings.

Results and Discussion

Vietnam 3.0 and Industry 4.0

For any country, policy maker, or governmental body aspiring to bolster its world player rankings, it is hard not to be envious or befuddled by the dazzling economic developments experienced by Vietnam post 1986 Đổi Mới. In a little over three decades this remarkable country has moved to lower middle-income status, experienced a GDP growth averaging 6.5 percent annually, became one of the top FDI attractors in the ASEAN, negotiated multiple free trade agreement networks, and climbed 13 places (since 2016) in the 2019 The World Bank's Ease of Doing Business rankings (Vinkenborg, 2017; The World Bank, 2019).

"In 2017, Vietnam's trade as a percentage of GDP reached over 200%. This is the highest level for any country with over 50 million people in The World Bank's data, which goes back to 1960" (Kopf, 2018, para. 2). "Of the world's twenty most populous countries, it blows away number two Thailand at 122%" (Kopf, 2018, para. 2).

For 2020, Vietnam's trade as a percentage of GDP was 209.3 percent (The World Bank, 2021). Two strategic factors fuel this flame: a cheap labor force and a laser sharp focus on manufacturing.

According to the CEIC (2021) (see Figure 1), Vietnam's growth prospects remain positive as reflected by forecasts for real GDP growth to remain fairly consistent over 2021-2026 in tandem with a more stable economic environment with inflation averaging 2.4% in June 2021. Vietnam's real GDP is expected to be 6.5 percent by December 2021 and 6.61 percent by December 2026. The year 2020 took a plunge as a result of the COVID-19 pandemic that was spread throughout the world. Global GDP is projected at an average of 6.03 percent in 2021 to 3.3 percent in 2026, with an inflation rate averaging 3.5 percent in 2021 (Statista, n.d.). Global GDP took a plunge in 2020 of -3.26 percent as a result of COVID-19 impact (Statista, n.d.). Looking longer term, a recent study by PwC (2017) suggests that Vietnam, the Philippines, and Nigeria could realize the greatest movement in world GDP rankings by 2050.

Vietnam touts its young and growing workforce, low cost working environment, and a government committed to growth as contributors to these stellar growth projections. "Vietnam's [favorable] demographics, which present considerable scope for policymakers to unlock gains in [labor] productivity, underscore the potential for [labor] market reforms as a powerful policy tool to drive economic growth over the long term" (BMI Research, 2017, p. 21). Several looming factors suggest that its stellar competitive position may be at risk as it "is still lagging behind its regional peers in terms of investment in education and productivity-enhancing technologies" (BMI Research, 2017, p. 33).

Vietnam's inadequately educated workforce almost topped the list of the most problematic factors for doing business in the country in 2017 (WEF, 2018a). This same report observed that major improvements need to be made to higher education since firms perceive that the lack of an educated workforce constitute a significant hurdle for doing business in Vietnam. Talent availability ranks in the upper 2/3 of factors determining job location decisions across a range of industries in East Asia and the Pacific (WEF, 2018b; Sakamoto & Sung, 2018).

There can be little arguing that Vietnam fortuitously perched itself for success in the last 21st century by fostering policies in the right place at the right time; i.e., initiating widespread economic reforms, capitalizing on its demographic base, and leveraging growth afforded by the Industry 3.0 movement. The ways of doing business, providing education, and running a government were totally disrupted at the end of the 20th century as computers were integrated into a myriad of domestic and global processes and procedures.

The next great disruption is now looming, foretelling transformations no less intense. Marr (2018) noted "from the first industrial revolution (mechanization through water and steam power) to the mass production and assembly lines using electricity in the second, the fourth industrial revolution will take what was started in the third with the adoption of computers and automation and enhance it with smart and autonomous systems fueled by data and machine learning" (para. 1). The operative construct of the Fourth Industrial Revolution (4IR) is without human involvement. This future view becomes especially jarring when considering the hypothesized ratio of human-machine working hours from 2018-2022 that extend far beyond the replacement of manufacturing jobs through automation (see Figure 2).

The World Bank (2018b) has proposed three reforms to address the threats and opportunities provided by global and domestic megatrends: (1) create more jobs in the modern sectors, (2) increase the quality of jobs in the traditional sectors, and (3) the need for a more agile and skilled labor force; whilst the World Economic Forum (2018a) focuses on four meta-concepts to navigate the 4IR: resilience, agility, innovation ecosystem, and human-centric pillars. More specifically, the innovation ecosystem considers (among other measures) high levels of human capital (health, education and skills) and the human-centric pillar evaluates education as a measure of the skills humans need to flourish in 4IR; in addition to measuring human relationships, collaboration, and ingenuity.

Labor productivity, wage inflation, and labor quality present persistent problems for Vietnam and this could potentially threaten its human capital competitive advantage vis a vis other competitor countries. Trends from 2012-2017 demonstrate that monthly manufacturing wage growth has been outstripping productivity gains in Vietnam, 48.90 percent vs. 21 percent respectively (Dezan Shira & Associates, 2018). Global capital investment will chase global benefits that are greater than costs. Vietnam has been able to offer an abundance of low cost and low skilled employees in the past…but will that matter if fluid "21st century skills" are required to foster innovation and uphold sustainable activities?

As other Southeast Asia countries ramp up investment in enhancing education, training, and new technology, Vietnam remains focused on existing industries. This parochial strategy, in tandem with burgeoning global and domestic megatrends; i.e., looming threats of unionization, escalating labor costs, ongoing criticism of workers' skill gaps, expansion of knowledge economies, plaguing corruption, and disruptive technologies may well portend a competitive disadvantage despite its current cost-effective labor force and consistent growth prospects.

The evidence points to the fact that HEIs must urgently rethink the current education system to tackle these megatrends, proactively address the invasion of 4IR, reduce the seeming disconnect between HEIs and the marketplace as employers lament their ability to find qualified candidates to fill open positions, and consistently provide quality higher education. Are Vietnam's HEIs ready and able to provide career-ready graduates to address these reforms and meta-concepts?

Vietnamese HEIs' State of Affairs

The halcyon days of the mid-1990s found global HEIs at the crosshairs of arguably (at that time) one of the most profound disruptions to the way professors teach and students learn, as a result of the integration of computers into the industry of higher education. This profound pace of change continued to accelerate. Now, as then, it is the implicit duty and mission of all higher education institutions to provide evidence that the mission of each institution is attained, and students are career ready when they graduate to help foster this socio-economic development of the country and further the common good. It is concurrently the responsibility of both domestic and international accrediting agencies, HEIs, and governments to confirm the attainment of this quality assurance.

Throughout Vietnam this proposition does not come without challenges due to external factors impacting the entire global higher education industry; such as the massification and internationalization of higher education, breakneck technological change, disparate stakeholder needs, student passivity, full transparency, heightened accountability, and altered competitive landscapes. In tandem, unique domestic environmental features include Vietnamese HEIs' wide-ranging level of maturity regarding quality assurance processes, fragile tensions between government/accrediting agencies/HEIs, institutional autonomy, laws and regulations, corruption, lack of resources, impractical curriculum and teaching pedagogy, low R&D investment, scholarship rigor, and cultural nuances.

Most of Vietnam's adult workforce can read, write, and possess basic numeracy skills. But the challenge now is to cultivate critical thinkers and problem solvers, equipped with a myriad of soft skills in addition to technical prowess. "Ultimately, preparing the workforce for an industrial economy is not just the government's job. It requires a change in behavior by all actors in skills development - employers, schools and universities and students and their parents alike" (Targeted News Source, 2013, para. 11).

Despite indications over the past decade that efforts have been made by the government and HEIs to address many of these environmental contingencies, evidence of tangible results remains slim. Protestations continue from potential employers, consulting agencies, and other stakeholders that a persistent skills gap exists in Vietnam. Tran's (2018) sweeping study assessing stakeholder perceptions of the principal causes of skills gaps in Vietnam well support work by Harman et al. (2009) that took place nearly a decade prior. Ten years later the same "blames" perpetuate:

- Ineffective pedagogical practices in universities
- Employers' strategies for staff recruitment and development
- Impractical curricula in universities
- Students'/Graduates' low efforts to develop professional skills
- Universities' poor facilities and ineffective student career development services
- Changes in the labor market
- Students'/graduates' passivity in planning and developing their career

The Global Talent Competitiveness Index (GTCI) presents global benchmarks regarding talent competitiveness and the future of work. Vietnam ranked 92nd (of 125 countries) on the 2019 GTCI (The Adecco Group et al., 2020). The spider graph in Figure 3 illustrates that Vietnam ranks particularly low on both Global Knowledge (GK) and Vocational & Technical (VT) skills pillars. Compared to the United States, Japan, and China, Vietnam's GK and VT scores are significantly lower and have been trending downward over the past few years.

Based on Vietnam's extreme dependence upon manufacturing, 4IR presents a true threat of job loss due to the rise of automation. Doomsday projections posit that robotics, automation, and artificial intelligence (AI) could potentially replace 800 million jobs globally in the coming decades. Mexico, Vietnam, and Indonesia rank amongst the highest at-risk countries (Koetsier, 2018). Manyika et al. (2017) project that 75 to 375 million individuals around the world may need to transition to new occupational categories by 2030 in the event of midpoint or early automation adoption. They also noted that nearly all jobs will involve a shifting mix of tasks and activities. The five highest factors impacting the extent of adoption feasibility include technical, costs of developing and deploying solutions, labor market dynamics, economics benefits, and the regulatory and social acceptance.

Although the prognostication that the demise of jobs is pending, this scenario can also be tempered by new employment opportunities for those possessing 21st century market esteemed skill sets; i.e., STEAM proficiencies, man-with-machine abilities, middle- and upper-management expertise, higher levels of quality education and experience, etc. It is hard to refute the fact that the composition of many jobs will be materially impacted in the near term as the very definition of occupations change.

Those workers engaged in stable, repetitive activities not dependent upon human judgement and in industries where capital expenditures provide material benefits for the cost, may well be facing downsizing, obsolescence, and/or the need for reskilling. Hundreds of millions of people worldwide will need to have access to preliminarily learn or reskill to possess marketable new competences throughout their lifetimes. The bottom line: HEIs must expand access to and enhance the quality and content of curriculum to best prepare current and future students who do not possess needed 4IR skill sets or the ability to capitalize on opportunities in knowledge intensive or service industries. Despite the need, most Organisation for Economic Co-operation and Development (OECD) countries have cut back on public monies spent on worker training over the 1993-2015 period.

Human Capital – Is There a Skills Gap

The Vietnamese educational system is definitely in need of reform. The curriculum is outdated, there is little pertinent institutional research being conducted, there is a gap in the education received to skills needed, among other deficiencies. The flaws in the educational system has left the country with college graduates being underemployed. In 2009-2010 academic year, the Center for Policy Studies and Analysis at Vietnam National University in Hanoi conducted a survey of the college graduates. The survey had 3,000 responses and revealed that 26.2 percent of graduates were unemployed, and from those graduates working, 61 percent stated they lacked sufficient working skills, 42 percent lacked experience, and 32 percent felt they lacked confidence in professional expertise (Vietnam National University, 2011).

In another survey conducted in June 2014, found similar results for graduating students. The University of Social Sciences and Humanities of Vietnam National University in Hanoi took a look at students' graduation employment. Vietnam National University utilizes national college exam for admittance and accepts students for admission with high test score results. As a result of strict admission standards, students' graduating from Vietnam National University are considered to have a better job prospective after graduation. In a sample of 400 alumni after two years after graduation, 96 percent have a job. Only 17.2 percent of the alumni stated that the job fitted their educational background, 37.2 percent felt that their skills were adequate, while 32.7 percent and 12.9 percent felt that their jobs were less appropriate and totally inappropriate with their educational background (Thi et al., 2015).

The investment into human capital is considered a central feature associated with the development of an economy. Sadly, countries tend to underinvest in human capital because the benefits are long tern in nature, which means in the short term, the benefits are not always visible (The World Bank, 2018). Vietnam's Human Capital Index ranks 48 out of 157 countries (The World Bank, 2018). Additionally, children in Vietnam are expected to complete 12.3 years of education by the time the child reaches the age of 18. When a students' education is adjusted for quality of learning, the education being received is equivalent to 10.2 years. The World Bank (2018) portrayed the learning gap experienced in Vietnam in Figure 4, after adjustment, Vietnamese education has a learning gap of 2.1 years.

For economies to be competitive around the world, proficiency in English is also a requirement. English proficiency correlates with "higher gross domestic product, higher average gross income, and growth in other key economic indicators" (Education First, 2018, p. 12). In order to move from an agriculture economy to a knowledge-based economy, the workforce must be able to sell services internationally, which implies English speaking skills is necessary for access into the international arena. In 2018, Vietnam ranked 41 out of 88 countries and 7 out of 21 Asian countries in English proficiency (Education First, 2018).

In 2020, Vietnam English proficiency decreased and ranked 65th out of 100 countries, and scored 473 out of 700, and would be considered "low proficiency" (Saigoneer, 2020). The Vietnamese Government admitted that its Project 2020 initiative of having college students recognized as proficient in English language has not come to fruition (Saigoneer, 2020). The USD $443 million Project 2020 approved in 2008 by the government was not implemented until 2012 due to the red-tape (Luong, 2016). Vietnamese government recognizes the importance of English as a foreign language, and English is being incorporated in the revised curricula.

The Degree of Academic Corruption in Vietnam

As Vietnam reengineers its educational system, there will be a need to minimize or eliminate the internal roadblocks that prevent global quality to ensure checks and balances are successful. There is very modest research on corruption in higher education. The lack of research might be attributed to the fact that parents/students and faculty/administration need to admit they were a contributor to the practice of corruption. In 2018, Transparency International gave Vietnam a rating of 33 on a scale of 0 to 100, with 100 being the least corrupt country. The corruption score of 33 represents a decline from 35 in 2017, and slightly higher than the 31 rating in 2012-2015. In 2020, Transparency International gave Vietnam a rating of 35, which is an improvement from the 2018 score (Transparency International, 2020). The Global Corruption Perceptions Index is the leader in researching corruption within the public sector (Transparency International, 2019). The corruption trend data does not indicate that the level of perceived corruption in Vietnam is diminishing. The perceived corruption in Vietnam seems to stay steady within a range indicating that corruption is still an issue. Bribery continues to be a problem in Vietnam.

Faculty members earn low salaries in Vietnam and when combined with limited seats for admission into universities, corruption is probable in order to subsidize unattractive wages. Payment of bribes to administrators to gain admission into a university or to have a students' grade favorably changed is customary. There is a common saying, "When you eat a fruit, think of the man who planted the tree" (Press, 2017, Teachers' Day). November 20 is Teachers Day, a day to show appreciation for teachers in Vietnam. Students deliver flowers (red roses) to their teachers in order to show their admiration to faculty. Today, in addition to flowers, teachers are given cell phones, designer handbags, and envelopes containing money. The money teachers receive in envelopes can be greater than their entire yearly salary. A recent survey revealed that 61percent of the respondents stated that parents pay bribes to teachers or school administrators (WENR, 2017). The survey further revealed that the bribe could be as high as USD $3,000 for admission to a desirable elementary school and 100 million dongs (USD $6,200) for university admission (McCornac, 2015).

Another issue in higher education is that of plagiarism. Plagiarism includes "the fraudulent acquisition of academic degrees, manipulated budget estimates and the 'leakage' of funds from public procurement projects" (projects such as teaching materials and construction of facilities) (WENR, 2017, Academic Corruption in Vietnam, para. 3). Corruption diminishes the educational quality being received and makes it difficult to foster development and employ educators. McCornac (2012) survey revealed that over 95 percent of sample students reported "they had cheated at least once in a class, and all had observed situations of cheating by other students" (p. 25). Students and faculty view cheating as normal expectancy from the Vietnamese culture (McCornac, 2015). Vietnam is committed to reforming higher education with its implementation of "Đổi Mới". The resulting goal was to increase the participation rate in universities; enhance the quality and efficiency of higher education; expand research in universities; improve the quality of teaching; development of industry; and to promote a linkage between education and the labor market (McCornac, 2012).

Education is considered to be the second most corrupt public sector in Vietnam (after the police) (WENR, 2017). Corruption in higher education can deny stakeholders access to a quality education, and it harms society because graduates will not have the skills in order to have a competitive productive career (McCornac, 2012). Global Corruption Perceptions Index ranks Vietnam as 33rd most corrupt country out of 180 countries in 2018. The elements contributing to this corruption include the speed of Vietnam's economic development, the lack of political accountability, and the rather sizeable red-tape from poorly paid state government (WENR, 2017). McCornac (2012) suggests that Vietnam needs to improve the attitude and perception of faculty and administration about corrupt practices. Additionally, regulations to discourage and prevent corruption must be enforced, otherwise corruption will continue. Stricter measures on national exams is a step toward eliminating corruption.

Another step in the development of achieving international recognition, the MOET introduced a new credit system, similar to that of the United States. The system permits students to select a curriculum, including elective courses, and courses range in credits from 2 to 4 credits each, with 50 minutes of in-class work and 100 hours of homework compromising a one credit over a 15-week semester (WENR, 2017). A new 4-point grading scale has been implemented, which corresponds to a letter grade for the course (WENR, 2017). In November 2016, the Prime Minister implemented a National Qualification Framework allowing for the transferability of academic credit (WENR, 2017).

Vietnam's Quest for Vocational Education and Training

Vietnam has become one of the fastest growing economies in Southeast Asia (Asian Development Bank, 2019). Vietnam university graduates experienced poor employability rates, as a result students are seeking vocational training instead. Between 2000 and 2010, the number of students enrolled in vocational training increased by 132 percent (WENR, 2017). A recent survey by Vietnam's Chamber of Commerce revealed that graduates lack industry specific and soft skills (Asian Development Bank, 2019). As a result, Vietnam needs skilled labor with the abilities desired by employers. Today, the curriculum is being modified to meet the demand of employers.

According to World News and Reviews (2017), the shortage of skilled labor is the outcome of Vietnam's rapid economic growth and foreign companies entering the country. School dropout rate in Vietnam is very high after fifth grade, especially in the rural and mountain areas. Today, the average education is about 8.5 years with a 95 percent literacy rate (Cameron et al., 2018). Vietnam's workforce is lacking skills needed for various fields, such as accounting, banking, health care and tourism (WENR, 2017). Employment in the agriculture industry dropped to 48 percent in 2011, leaving about 1 million workers transitioning from agriculture sector to industry and service (WENR, 2017). Approximately 83 percent of Vietnam's workforce was unskilled in 2012 (WENR, 2017).

In response to staggering under skilled numbers, the Vietnamese government placed human capital development as a top priority (including higher education). The Vietnamese government allocated about 20 percent of its budget to education; however, its primary priority has been to expand early childhood, primary, and secondary schools (Dao, 2015). The Asian Development Bank (2018) approved to contribute USD $78 million to help finance Vietnam's retraining efforts designed to meet the needs of Vietnam's labor force. USD $75 million loan is expected to be used to provide training equipment to 16 national institutions, with a focus on skill training (such as automation, automotive, biotechnology, electronics and mechanics) (Asian Development Bank, 2019). The remaining USD $3 million grant is being financed by the Japanese Government in order to develop soft skills (such as communication, problem solving, and teamwork) in areas that would be considered disadvantaged communities (Asian Development Bank, 2019).

Government pushed for the development of new vocational training institutions and sought assistance from Australia, Germany, Korea, Japan, the EU, and the Asian Development Bank in order to build an up-to-date training program (WENR, 2017). Vocational education and training are intended to develop a "skilled workforce that contributes to making the country economically competitive, both regionally and globally" (United Nations, 2018, p. 7). The governments expectations will raise vocational training upward to 65 percent of the population by 2020 and to offer career programs to 80 percent of all students (WENR, 2017).

According to the United Nations (2018), the "Law on Vocational Education" was passed on July 1, 2015 and the law regulates the national education system, including curriculum content and pedagogy, types of vocational education training institutions, and the types of certificates and diplomas awarded to graduates. Vocational education is primarily funded by the state budget. During 2010-2014, the state budget allocated USD $2.54 billion, of which 37.4 percent went towards recurrent expenditures, 40.81 percent for capital construction, and 21.79 percent for national target programs (United Nations, 2018).

There are some challenges of study at vocational schools. According to the Ministry of [Labor] (cited in the United Nations (2018)), challenges include (1) integrating and adopting technology in a timely fashion; (2) too few skilled employees working in the vocational training sector making it difficult to developing programs; (3) students receive poor guidance about enrolling into training programs thus creating mismatch between the skills needed and increasing productivity; (4) increasing the autonomy of the vocational schools and holding those schools to greater accountability while strengthening the governance systems; and (5) external organizations and employers need to be more involved in the development of vocational schools.

As far as accreditation is concerned, in 2015, the number of vocational schools conducting self-assessment increased to 343 schools, leaving 1,123 technical schools not in legal compliance. The number of vocational schools externally accredited by the government was 23 schools (Hung, 2017). Furthermore, in 2015 there were no external accreditation conducted for colleges and professional secondary schools under the control of the MOET. A lack of enrollment into vocational schools seems to be a problem. The General Statistics Office revealed that 1 of every 5 unemployed people hold either a bachelor or master degree. However, 62 percent of Vietnamese employers' state they have difficulties in filling job vacancies (ICEF Monitor, 2016). It would seem that students would be flocking towards enrolling into vocational schools, but that prediction does not seem to be true.

The government envisioned that by 2020, 55 percent of the working population will have skills acquired through vocational training, which is greater than the 15 percent experienced in 2016 (ICEF Monitor, 2016). Vietnam needs to continue to strengthen its educational system. Only 20.6 percent of the workforce has achieved post-secondary education, and over 50 percent of employers offer internal training (Cameron et al., 2018). Revising the curriculum to meet employer needs, adding quality control measures that make administration accountable, and expand collaborations with International constituents would be positive mechanisms in order to assist in the development of Vietnam.

Addressing Future Shock with Quality Higher Education

The World Economic Forum (2016) speculates that 65 percent of children entering primary school will land in careers in jobs that don't exist today. The "gig economy" has increased by 50 percent in the ten years since 2005 (Kitz & Krueger, 2019, p. 17). A Q2 2018 survey by Upworks reveals that there is an anticipated 179 percent increase in the need for flexible talent over the next 10 years in the United States (due in large part to talent shortages) and that 70 percent of the fastest growing skills were not on the list previously (Upwork, 2018). Altering demographics, demands for more specialized products, and productivity gains/cost savings drive the anticipated exponential growth of AI.

During past industrial revolutions it took time to build institutions and develop training processes. 4IR does not afford that luxury. The "current technological trends are bringing about an unprecedented rate of change in the core curriculum content of many academic fields, with nearly 50% of subject knowledge acquired during the first year of a four-year technical degree outdated by the time students graduate" (WEF, 2016, p. 20). "[Additionally, on] average, by 2020, more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today" (WEF, 2016, p. 20). Focusing on today's necessary skills set undermines and miscalculates skills and abilities necessary for the future of work. Many hard and soft skills widely esteemed today across all industry sectors are also subject to major disruptions in the future.

Overall, social skills—such as persuasion, emotional intelligence and teaching others—will be in higher demand across industries than narrow technical skills, such as programming or equipment operation and control. "Content skills (which include ICT literacy and active learning), cognitive abilities (such as creativity and mathematical reasoning) and process skills (such as active listening and critical thinking) will be a growing part of the core skills requirements for many industries" (WEF, 2016, p. 22-23)

In the past, educating students and retraining workers was retroactive and reactive; oftentimes the result of copycat curriculum, pedagogical complacency, technology innovations, advisory board consultations, major economic disruptions, or colossal layoffs. This can no longer be the case. Several pioneering programs already launching in anticipation of the need for ongoing lifelong learning; i.e., industry/community college collaborations, "career pathways", hybrid liberal arts and technical education, and "work sharing" (Selingo, 2018, para. 24-25). "Training must occur more regularly and less episodically than it does now in order to keep pace with the increasing churn of jobs" (Selingo, 2018, para. 20).

HEIs today are faced with unremitting competition, the need to constantly innovate, utilize information to make decisions and manage risk, keep customer focused, manage shrinking resources, and relentlessly improve. Organizational sustainability demands resilience, adaptability, and flexibility when faced with technological changes, new regulations, the massification of education, and novel ways of doing business. Tertiary education must stay laser focused on setting and reaching a standard of excellence, constantly improving, making decisions based on evidence, and driving excellence. HEIs can strategically choose to convert the coming mega-trend disruptions into an opportunity rather than a threat by focusing on quality.

But what does *quality* mean? Even the American Society for Quality recognizes the challenges of the word *quality* by including in its glossary this meaning: *A subjective term for which each person or sector has its own definition. In technical usage, quality can have two meanings: 1. the characteristics of a product or service that bear on its ability to satisfy stated or implied needs; 2. a product or service free of deficiencies* (ASQ, n.d.). There is clearly no single definition of the word and the meaning is oftentimes in the eyes of the beholder. Consequently, its multidimensionality, profundity, and complexity require multifaceted actions to assure, assess, and enhance it.

Ball got it right when he posed the following question in his infamous essay, "What the hell is quality?" (Ball, 1985). The very meaning of the word is elusive and idiosyncratic in any domain—and its connotation in the HEI setting is no less befuddling based on its malleable, multifaceted, and complex gist—dependent upon context, unique institutional missions and objective, program and discipline dependent. Quality therefore can assume different and even contradictory meanings depending on (i) the perception of various interests of different constituencies or stakeholders in higher education (e.g. students; HEIs; employers; society; government); (ii) its references: inputs, processes, outputs, missions, objectives, etc.; (iii) the aspects of the academic world worth appraising; and (iv) the context in history of the development of higher education (Vlăsceanu et al., 2007). There can be no disputing that quality matters.

The concepts of quality, quality assurance, and quality enhancement hold high importance in creating and delivering a product/service that offers customers the utmost value while simultaneously generating a competitive advantage to the provider of these products/services. In the 1950s, Walter Shewhart took the literal meaning of quality (qualitas meaning "how constituted" in Latin) to define two dimensions of quality: (1) *objective*--the objective reality of an object independent of the person and (2) *subjective*--the quality of something in relationship to the way a person feels or senses about the objective quality (Bacivarov, 2014). He ultimately developed the plan-do-study-act (PDSA) system that introduced cycles for strengthening quality and still prominently influences the field today and lays the foundation of assessment processes in place in most HEIs assessment systems today.

It is no coincidence that as the total quality management (TQM) movement was gaining significant traction in the business sector in the 1980s that many HEIs concurrently started to jump on this quality bandwagon. In the HEIs' world a perfect storm was brewing demanding increased program and learning outcome transparency due to spiraling tuition concurrent with declining student academic achievement, questionable public funding allocations, new modes of program delivery, and the meteoric rise of (seemingly second rate, based on completion rates) for-profit institutions.

Soon the concepts of efficiency, effectiveness, standards, and performance measurement started to enter the quality for HEIs (Cave et al., 1997). A deeper exploration started to surface analyzing the relationship between performance indicators and the measurement of quality. One of the biggest problems faced is the multiple definitions of quality and the concomitant determination of relevant performance indicators.

One constant thread of the various industry-based quality concepts is customer focus. Harvey and Green (1993) seminal work categorized five distinct concepts of quality: exceptional, perfection (consistency), fitness for purpose, value for money, and transformative. Garvin (1984) proffered that product quality is transcendent, product-based, user-based, manufacturing-based, and value-based. Other research offered a conceptual model of quality: accountable, purposeful, exceptional, and transformative (Schindler et al., 2015). More recent research focuses upon the stakeholder context (Ulewicz, 2017). For example, governments will be concerned with return on investment as evidenced by workforce ready graduates; universities may utilize measure student engagement as a proxy for a quality educational experience.

It was an easy assumption to make that capitalizing on TQM best practices from business and industry and diffusing them in the context of developing and deploying quality education would ultimately enhance quality initiatives and outcomes and obviate disparate stakeholder demands. The practice of defining, developing, measuring, assessing, and assuring quality in the HEI service domain started to gather traction. Quality was about to become the sine qua non of teaching and learning. This strategy was simultaneously brilliant and problematic.

The Significance for HEIs

Returning to a recurring definition of quality proffered by the industry gurus; i.e. "conformance to requirements", it is natural to aspire to establish a standard as surrogate for quality. As difficult as it is to define "quality", so too is it to define a "standard" in the context of HEIs.

By measuring its conformance to a benchmark, setting a standard for a physical product is more straightforward than determining standards for the "product" of HEIs where the constructs of quality vary contextually.

The construct of quality pervades all facets of HEIs, locally, regionally, and internationally. Its significance underpins countless initiatives put in place by global institutions such as the United Nations Educational, Scientific and Cultural Organization (UNESCO), Organisation for Economic Co-operation and Development (OECD), The World Bank, and the International Network for Quality Assurance Agencies in Higher Education; in addition to domestic think tanks and philanthropies such as the Brookings Institution, the National Bureau of Economic Research, and the Hewlett Foundation. Laser focused governmental bodies and accrediting agencies are symbiotic key players; i.e., the Department of Education, the Council for Higher Education Accreditation (CHEA), and the Higher Learning Commission in the United States. Similar regional accrediting bodies exist around the world, further reinforcing its impact and scale.

A deliberate focus was placed on providing quality education for all by offering that learned knowledge, skills, and dispositions must reflect and respond to the needs and expectations of individuals, countries, global population, and the requirements of the contemporary workplace (UNESCO, 1990). The United Nation's 2030 Agenda for Sustainable Development seeks to "ensure inclusive and equitable quality education for all and promote lifelong learning" (United Nations, 2017, Title). Sub-goals to this lofty endeavor include assuring access to quality tertiary education and bolstering the number of employment ready graduates.

The 2017 World Economic Forum's Realizing Human Potential in the Fourth Industrial Revolution explored education ecosystems necessary for the future. Relevant educational curricula that conveys the knowledge and skills necessary in the modern workplace, establishes early learner identities, fosters global citizenship morals, and nourishes core noncognitive skills are critical. Education establishes the foundation for future reskilling and the fulfillment of one's potential. This same white paper posits that educational curricula cannot be static since it is impossible to expect HEIs to anticipate necessary skill sets for career paths not even yet created. What is relevant is fostering flexibility, resiliency, and a craving for lifelong learning for students. HEIs will need to make seamless the ability to nimbly recalibrate as informed by mutable labor market needs.

Despite the type of education system it is posited that "curricula must be: 1) updated and adapted on a rolling basis, based on insights and forecasting regarding the evolution of local and global [labor] markets and trends in skill demands; 2) developed and revised collaboratively, with input from all relevant stakeholders, including businesses; and 3) subject to regular review, in order to avoid the disruption and implementation time-lag associated with major but infrequent curricular overhauls. It is also important to teach "how to learn" through experience-led approaches just as much as instruction-led ones, and by empowering students to be lifelong learners who take ownership of their upskilling throughout their lifetime" (WEF, 2017, p. 8).

The World Economic Forum's dynamic transformation map (see Figure 5) illustrates the interrelationships and interdependencies of various forces impacting Education and Skills. The 21st Century Curricula contributors include values, behavioral sciences, information technology, civic participation, innovation, and the Fourth Industrial Revolution. Interestingly, in real-time, of the six inner circle issues impacting and impacted by education and skills, five skills (all but Quality Basic Education) are directly linked to the Fourth Industrial Revolution.

The Good, the Bad, and the Leverageable of Assessment, Accreditation, and Quality Assurance

Creating a higher education milieu for the 21st century learner in Vietnam is laden with multiple challenges—both leftover from the previous decades of the massification of HEIs and layered with an uncharted future landscape. Various accrediting bodies (CHEA, NIAD-UE, JIHEE, HLC, MOET) across the globe require certain standards to be met; but upon evaluation most standards are congruent and consistent. These domains encapsulate many of the core themes:

- Mission
- Resources and capacity
- Teaching and learning
- Internal quality assurance (planning, implementation, effectiveness, improvement)
- Sustainability

Vietnam's recent initiatives to foster quality assurance through accreditation, assessment, and audits offer promising steps forward in raising the quality bar. Yet, numerous disturbing and persistent factors; i.e., lack of independence in accreditation, low research and development expenditures, bureaucracy, compromised infrastructure, corruption, paucity of legitimate scholarly publications, and the persistent skills gap potentially mitigate quality gains (Nguyen, 2018; Nguyen et al., 2017). The government has scaled back its authority over higher education and allowing more autonomy. The curriculum is being modified to meet the demand of employers.

Despite accreditation's best intentions, the clash of 21st century student preparedness needs and the reliance on traditional accreditation standards renders current quality assurance mechanisms at times obsolete, unimpressive, with limited value added. Evidence from the United States abounds: compliance vs. commitment mentality, assessment fatigue, innovation killer, accreditation granted to sub-par HEIs, misunderstanding and confusion regarding the relevance of accreditation, etc. Many existing institutional outcomes assessments contend causal relationships between academic quality and student outcomes (Lochner & Monge, 2014). "This is often out of methodological convenience or a desire to elevate the perceived quality of one's own institution" (USDE, 2018, p. 3). Other evidence can be seen in "close" relationships between accrediting bodies and licensing boards that have "resulted in credential creep in the name of occupational protectionism" (USDE, 2018, p. 3).

Similar protestations emanate from Vietnam even though MOET recently established a National Accreditation Council to oversee the accreditation process. In the last few years a National Qualifications Framework has been implemented to offer a framework regarding the expected standard for student learning. Still, there are no Vietnamese universities ranked in the world's top 1,000 universities (despite a large increase in the number of universities over the past ten years), teacher quality remains a persistent challenge for Vietnamese HEIs, and there has been little change in teaching-learning pedagogy (Temmerman, 2019).

"Higher education is in the midst of a revolution: institutions, processes, providers, delivery and financing models, student demographics, and even societal and political perceptions of the value of higher education are, and have been, changing rapidly" (HLC, 2019, p. 3). "These changes impact not just institutions of higher education, but accreditation processes as well, and they require intense self-reflection, analysis and action" (HLC, 2019, p. 3). The Higher Learning Commission (HLC) study suggests that to make this transformation happen will require a collaboration between all HEI accrediting partners that resolves issues such as candidacy, credentialing, outcome definition and measurement, alignment, reskilling and up skilling, various delivery models, etc. and "Student-centric higher education should be the norm, with an explicit emphasis on quality" (HLC, 2019, p. 7).

This focus relies upon clarifying the purpose and goals of accreditation for all stakeholders, that HEIs "fit the purpose of the students' educational intents" through accrediting bodies' assurance of quality, contemplation of learning opportunities offered throughout and across educational ecosystems, and a reconsideration of relevant measurement tools to assess success (HLC, 2019, p. 9). Going forward, it will be critical for change agent policy makers in Vietnam to consider the fundamental and foundational starting point for all assessment: What are HEIs' intended outcomes? At the very minimum MOET, accrediting bodies, and HEIs must put forth an implicit and explicit promise to deliver their mission and maintain an intensity of difficulty and quality that assures value to all stakeholders. Contemporaneously, students must well participate in the learning process and come to the university knowing that their ultimate success resides on their shoulders.

It is essential that Vietnam capitalize on best practices garnered from the global accreditation community to pragmatically review its current quality assurance mechanisms to restore stakeholder trust and ensure that its higher education system offers and delivers quality outcomes for it graduates. Recently proposed strategies emanating from the U.S. Department of Education (USDE) (2018) may well offer several leverageable tactics for Vietnam as it reviews, reengineers, and implements effective and efficient accreditation, assessment, and quality assurance processes. For example, Vietnam should:

1. Establish and implement an autonomous, corruption proof system of checks and balances that loops in MOET, independent accrediting bodies (institutional and program based), and HEIs. Clarify roles and responsibilities of these actors.
2. Reduce barriers to entry for entrepreneurs able to offer specialized learning opportunities; i.e., credentialing, apprenticeships, advisory councils, distance learning, etc.
3. Mitigate and balance risk as much as possible when confronting changes to the status quo.

4. Foster educational mobility by establishing a robust credentialing system and/or better transferability of credits between institutions.
5. Establish clear lines of responsibility and jurisdiction between accrediting and licensing bodies.
6. Support innovation that addresses current and future workplace needs.
7. Enlarge and protect the autonomy of HEIs.
8. Establish true, context specific, value-added metrics that support cause and effect outcomes.

If recently recognized flaws of accreditation can be addressed and stakeholders can accept the quality assurance provided by accrediting bodies as trust-worthy, authentic, developmental, and value added, then perhaps accreditation can be used as a surrogate for sustainable quality higher education. The time is now for accreditation reform, offering ongoing opportunities for lifelong learning and career preparation, and the development of innovative metrics to assess outcomes.

The Role Played by Accrediting Bodies

Vietnamese government recognizes that enhancing knowledge and developing skills is crucial for the country to flourish. In 2003, the higher education and accreditation system was introduced into Vietnam's higher education (Nguyen, 2017). HEI are required by law to have institutional accreditation. In order to be competitive, the HEI are obtaining program and/or international accreditation. The accreditation process in Vietnam is in its infancy stages when compared to developed countries, such as the United States. There is disconnect between institutions and employers, and as a result, skills needed by the workforce are not being taught adequately in the universities.

Accreditation practices and polices differ from country to country. In some countries, accreditation policies are administered by the government, while in other countries, those policies are administered by independent external organizations. In Vietnam, university accreditation is authorized by the government, and universities can seek institutional and program accreditation, with prestigious universities further seeking international accreditation. Higher education accreditation is expected to be: (a) independent, lawful, and objective; (b) honest, openness and transparent; and (c) equal, mandatory and periodic (Giao, 2016). The accreditation process itself in Vietnam is composed of: (a) educational institutions conducting self-assessments; (b) universities register with an accredit organization and recognition of educational quality standards; (c) an accredit organization conducts the external reviews; and (d) accredit organization appraise, recognize or deny the quality standards of institutions (Giao, 2016).

In 2016, Vietnam had 553 institutions complete the required governmental assessment report, and only 60 universities were externally accredited (Giao, 2016). The slowness in adopting external accreditation might be attributed to administrators and faculty uncertainty on what to do with the assessment results, thus they do not see the assessment process as value adding. The quality standards implemented in Vietnam are in its infancy stage compared to those regionally and internationally. Universities have not been favorable of assessment because there is a lack of policies that connect the competed self-assessment report to expectations of universities, and due to lack of training, many administrators do not believe the self-assessment reports are accurate. Today, there are five national and regional quality centers in Vietnam. According to Circular 12/2017/BGDDT, Vietnam assessment contains 25 quality standards with 111 criteria. The assessment standards are in more alignment with the ASEAN framework, which is expected to strengthen the Vietnam's learning outcomes, and enhance the transferability of credits among ASEAN members.

The accrediting organization in Vietnam is a specialized unit with authority of the government. The National Council for Accreditation of Education is established by MOET, and is responsible for the accreditation activities. In Figure 6, Giao (2016) clearly portrays the accreditation process in Vietnam. Most universities in Vietnam conduct an internal self-assessment process in order to meet the governmental quality standards. However, the accreditation system used fails to keep current with the requirements for the social and economic development of the country. The system lags behind its regional and international peers in terms of the quality level (Giao, 2016). As a result, improving accreditation in HEI has been of heightened interest by government for improvement.

The MOET initiated a new form of quality assurance and the new system is based upon institutional self-assessments and internal quality assurance, which would be evaluated by an external accreditation agency. Established by the MOET, Vietnam has five accrediting agencies. The five national and regional external quality centers agencies are: Danang University, Thai Nguyen University, Vietnam National University Hanoi, Vietnam National University Ho Chi Minh City and Vinh University. These five agencies are authorized by the MOET to conduct accreditation in Vietnam.

The government has given up its tight control over higher education and is allowing more autonomy within the HEIs. The five accreditation centers are close to being completely financially independent from the government. Additional agencies could be developed in the future to undertake the external quality assessment because of the volume of institutions that will be expected to be reviewed for accreditation (Nguyen et al., 2017). The curriculum is being modified in order to meet the demands of the employers.

Vietnamese HEIs had expectations of having a competitively advanced higher educational system meeting international quality standards by 2020. Vietnam HEIs current revised quality framework aligns with the ASEAN Qualifications References Framework. The ASEAN framework allows for the transferability of qualifications on a region-wide basis for ASEAN members. The ASEAN framework strengthens the quality of the Vietnam's academic programs by providing learning outcome and benchmarks. Most HEI have established internal quality assurance divisions. Internal divisions review quality assurance behaviors within the institution. In 2012, MOET survey revealed that the institutions' internal assessment division was intensely involved in building and managing a testing bank center; collaborating to organize exams; collecting feedback from employers, graduates and students; conducting institutional and program self-evaluation; developing guidelines for internal quality assurance; evaluating teaching activities; among other various activities (Nguyen et al., 2017). Vietnam HEI are clearly demonstrating the importance of accreditation and quality assurance within the educational system.

Conclusion:

Over the past 30 years, the Vietnamese economy has been growing by leaps and bounds. The economic and political reforms instituted have transformed the region into a low-middle income country. The stakes are quite high in Vietnam's higher education landscape. Vietnam is experiencing a demand for higher education. The government expected enrollment to reach 4.5 million students by 2020, representing a 99 percent increase since 2013 (Dao, 2015). The government expectations were exceeded, as the 2019 enrollment reached 6.8 million students in tertiary education (UNESCO, 2021). The increase in tertiary education could be attributed to Vietnam restoring health personnel, STEM curriculums, and other demands that higher education faces (Lee, 2018). While the population of Vietnam is more educated, the educational arena has further developments in order to remain competitive on an international basis. It is the duty and mission of HEIs to provide quality, career ready graduates to help foster this socio-economic development of the country and further the common good. Despite indications over the past decade that efforts have been made by the government and HEIs to address these HEIs' environmental contingencies, evidence of tangible results remains slim. Its curriculum is not meeting the demands of the workforce, its English proficiency has been declining, there has been a lack of accreditation, and etc. The greatest challenge may be ability of the Vietnamese government and HEIs to minimize and/or eliminate the internal roadblocks preventing the implementation of global quality initiatives to ensure success.

The Vietnamese government does recognize the importance of education and has been spending 20 percent of its budget on education, primarily in primary and secondary education. Since the government has been incurring this educational expenditure, Vietnam has seen higher completion rates in primary schools, lower student/teacher ratios, and lower out of school rates (GPE, 2021). Vietnam's has a younger population, and a rising lower-middle class, the younger population has more disposable income as compared to their parents, and as a result, the young are eager to develop the skills and knowledge needed in order to meet the demands of the 21st century (Pham & Le, 2020). However, when students attend college, they expect to obtain a job within their chosen profession after graduation. After graduation, the lack of employment leaves these colleges graduates seeking additional training in order to acquire new skills, such as entering vocational training, in order for the graduates to obtain a position. As a result, college education does not look attractive if acceptable employment is not available. The Vietnamese government has been spending money towards enhancing vocational training. Vocational training can be considered a good method to enhance one's education provided the training is developed and designed jointly with the employer (World Bank Group, 2018). Matching the skills of jobseekers to those of vacant positions should align the supply and demand more closely. In a recent study, less than 10 percent of Vietnamese between ages 15-24 and 25-44 are taking advantage of the vocational training (World Bank Group, 2018). There have been shifts away from the agriculture industry into a skilled workforce. A high-quality international education looks attractive to Vietnamese in order to fulfill the skills gap that is being experienced in Vietnam.

Most global higher education institutions are finding themselves vying for a shrinking and scrutinizing student population due to the massification and internationalization of higher education, breakneck technological change, full transparency, heightened accountability, and altered competitive landscapes.

It is the duty of HEIs to provide evidence that the mission of each institution is attained and students are career ready when they graduate. It is the responsibility of both domestic and international accrediting agencies to confirm the attainment of this quality assurance. Throughout Asia this proposition does not come without challenges due to HEIs' wide-ranging level of maturity regarding quality assurance processes, fragile tensions between government/accrediting agencies/HEIs, and stakeholder understanding of the relevance of accreditation. This paper focused on the author's recent fieldwork and scholarly literature research exploring quality higher education in Vietnam. Based on interviews and research, the role of accrediting agencies was evaluated as a potential collaborator to advance high quality higher education. Alignment with accrediting agencies can yield significant assets for HEIs (i.e., reputation, enrollment, ranking, employer networking, retention, financial enhancement, learning quality, alumni commitment) that can lay the critical foundation for enhanced global preparedness. According to ICEF Monitor (2016), "the Vietnamese economy needs skills: English skills, IT skills, and targeted training for a wide range of occupations and industries" (para. 16). The stakes are high in Vietnam.

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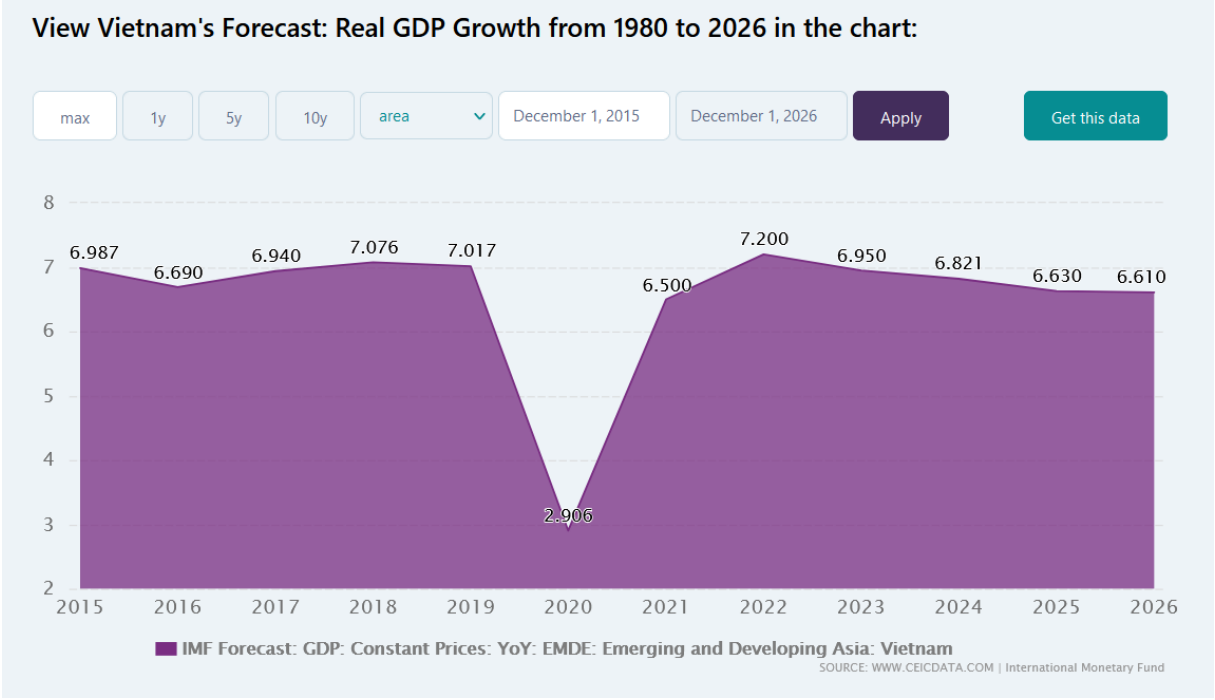
Figure 1

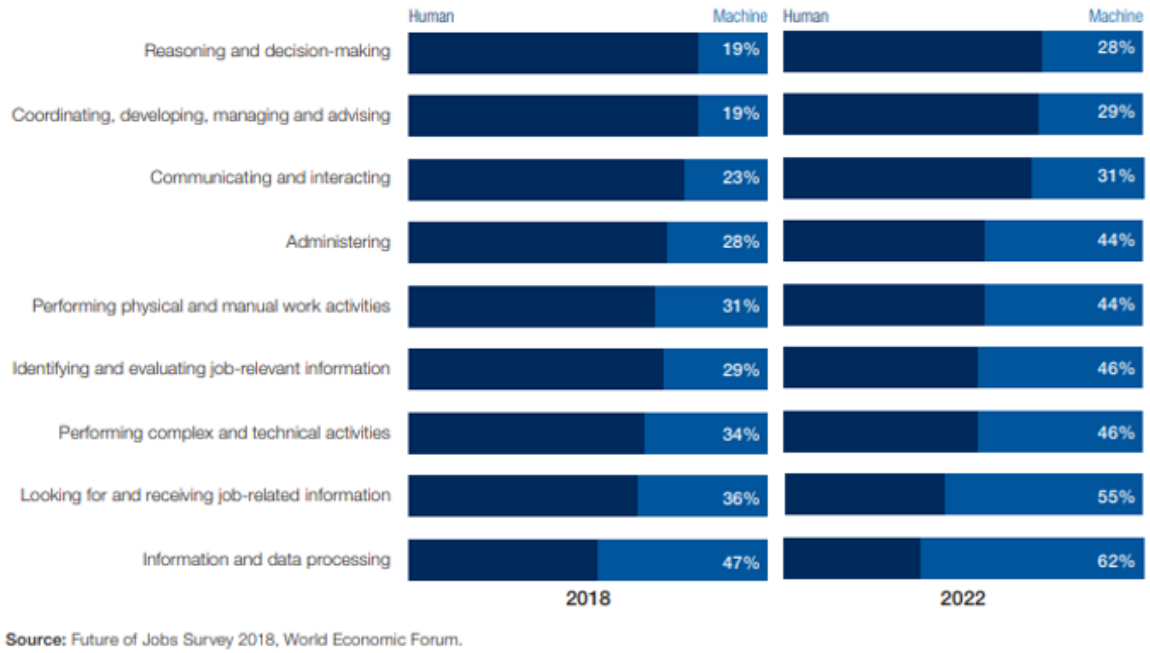
Vietnam's Forecasted GDP Growth 1980-2026



Source: CEIC, 2021

Figure 2

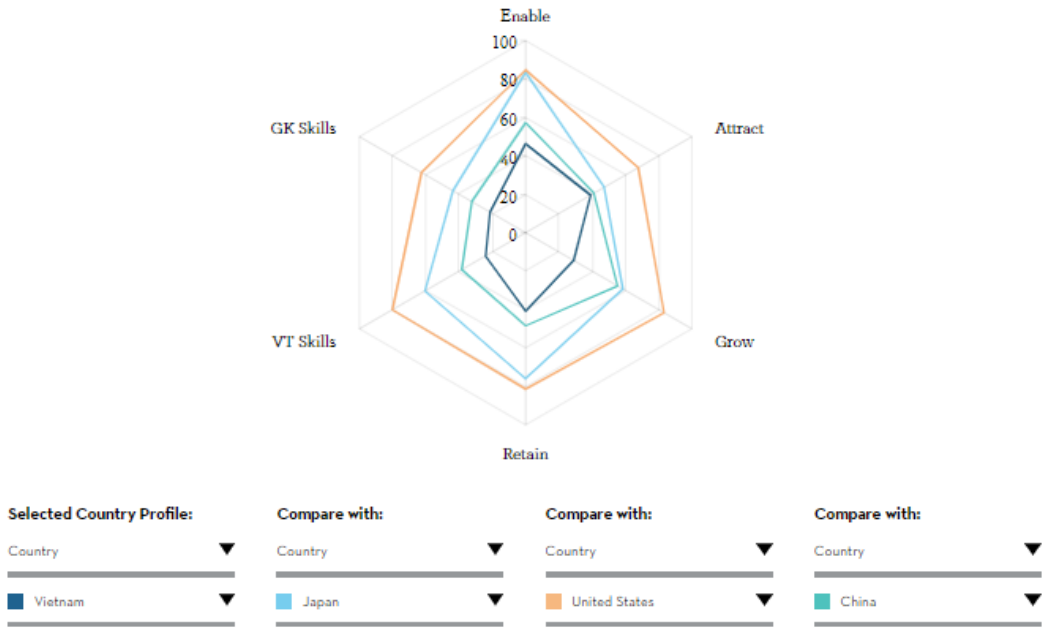
Ratio of Human-Machine Working Hours 2018 vs. 2022 (projected)



Source: World Economic Forum, 2018

Figure 3

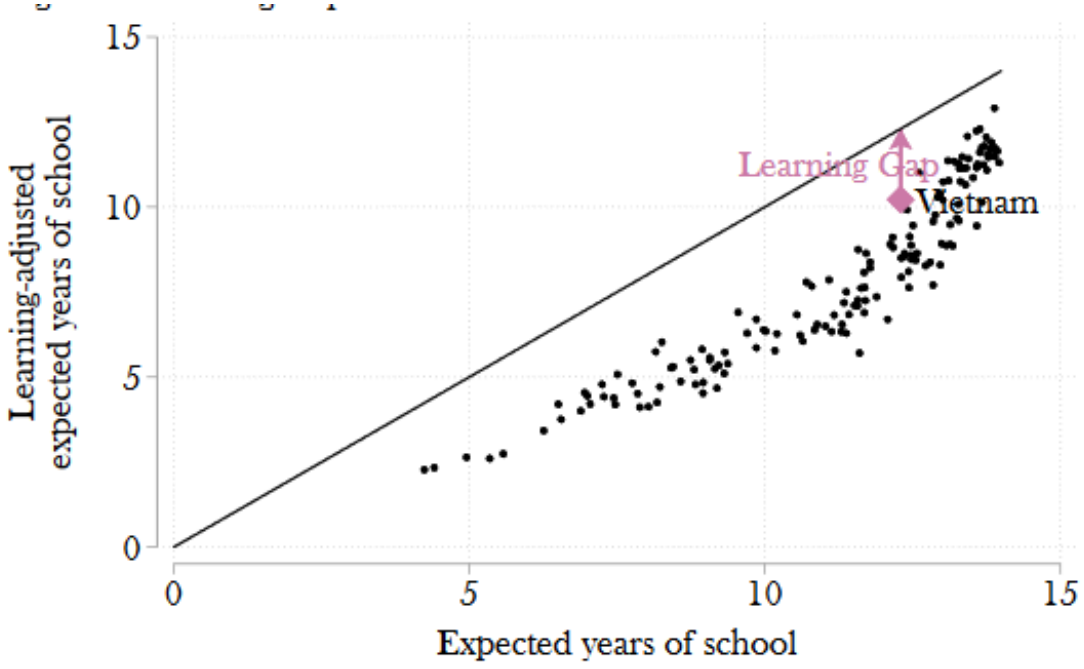
Spider Graph



Source: Global Talent Competitiveness Index, 2019

Figure 4

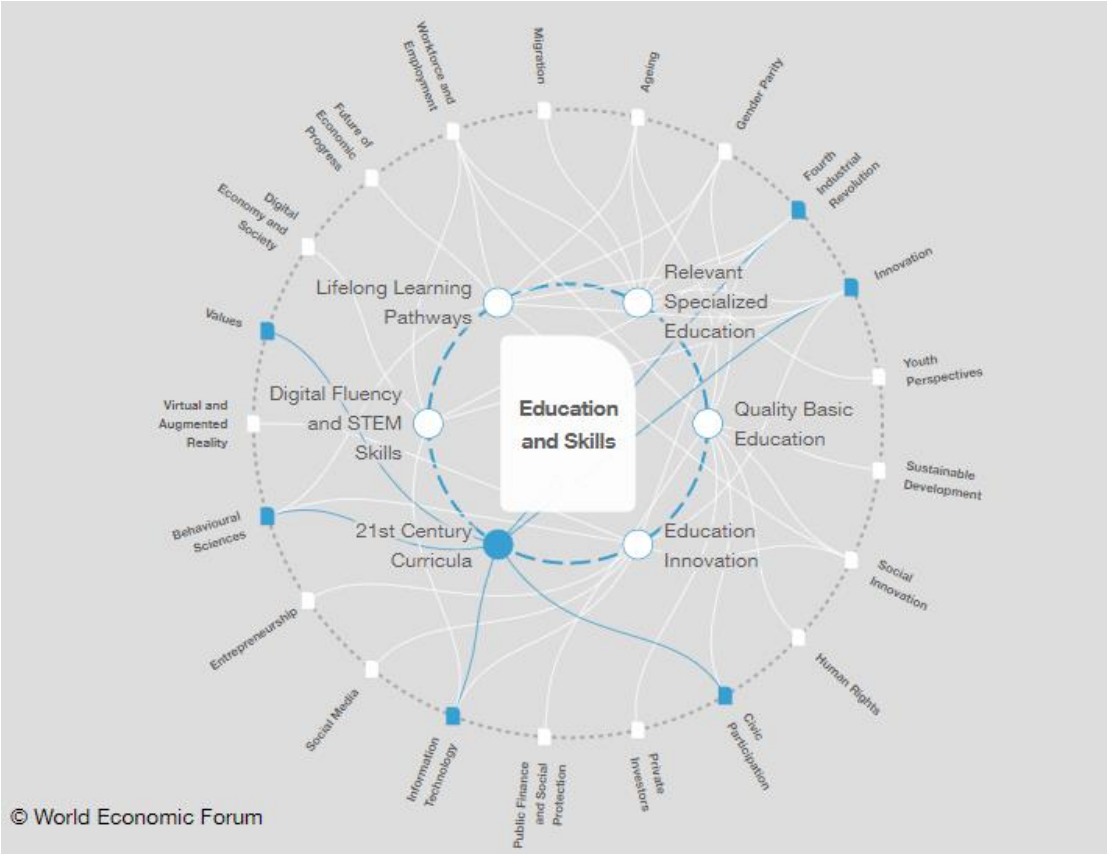
Learning Gap



Source: The World Bank, 2018

Figure 5

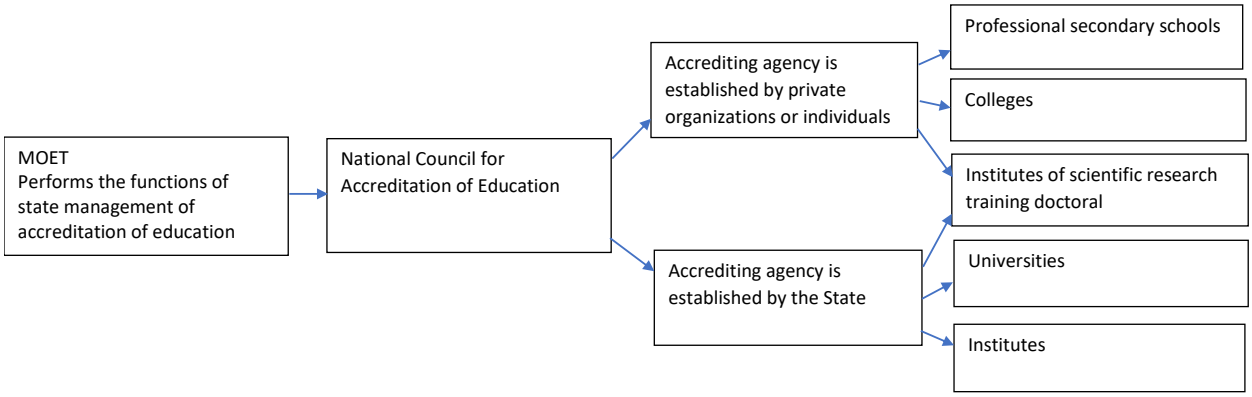
Mapping Education and Skills



Source: World Economic Forum, 2019

Figure 6

Vietnam Accreditation System of Higher Education



Source: Giao, 2016