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Essential Skills for Thailand 4.0: The Importance of Education Corresponded to Employment Scenarios, and Building Self-Competent Immunity Pertaining to Technological Disruptions

ทักษะที่จำเป็นสำหรับยุคประเทศไทย 4.0 : ความสำคัญของการศึกษาในมุมมองของการจ้างงานและการสร้างภูมิคุ้มกันตนเองของนักศึกษาในสภาวะการเปลี่ยนแปลงที่เกิดจากเทคโนโลยีดิจิทัลรูปแบบใหม่

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Abstract

Inspired by the importance of realizing Thailand 4.0 policy concerning skills required for job opportunities and fields of studies relevant to technological disruptions, and what to prepare in order to stay relevant and competitive in the ever challenging and increasing competition in the jobs market demands, the academic article has been written with an aim to provide a gainful insights and useful guidance for students, educators, public and private institutions, and business people at large. Furthermore, the article sheds light on the employment landscape and explores scenarios in both macro and micro levels related to fields of study corresponded to the future employment opportunities for students, job seekers and concerned stakeholders to strongly consider before making a career decision whether it be the suitable enrollment field with demand in the jobs market and/or lines of jobs that are/will be needed in the market going forward. Additionally, the article identifies both hard and soft skills required to compete as well as fields of work that will be in demand pertain to Thailand

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4.0 model as well as ways to prepare and curb with potential of digital transformation, robotics and machines automation to replace humans, specifically monotonous tasks and functions as the digital technology has continued to evolve. For students and job seekers whose expertise and capabilities are not technologically inclined to suit Thailand 4.0 and S-Curve's requirements, those who graduated in social studies or related disciplines in particular, the windows of opportunities lie in people-oriented, customer interactions or customer service aspects along with competent communication in foreign language (s) skills (ideally, TOEIC exam capacity of minimum 550 required by many leading companies) though complemented of critical/strategically thinking, problem solving, and importantly human skills. That said, with enhanced capabilities to apply human emotions, intuition, and be able to understand and deal with people and customers' feelings and needs, having empathy towards others, and able to apply all these attributes to handle and resolve emotional/attitude-linked issues and matters, thereby are considered as a competitive advantage, serve as immunity, and without a doubt, are irreplaceable by intelligent machines.

Keywords: Technological Disruptions, 21st Century Students, Thailand 4.0

บทคัดย่อ

ปัจจุบันทุกภาคส่วนและองค์กรทุกระดับในประเทศไทยมีการปรับตัวเพื่อตอบสนองต่อนโยบาย Thailand 4.0 ซึ่งเกี่ยวข้องโดยตรงกับการพัฒนาทักษะที่จำเป็น อันจะส่งเสริมโอกาสในการได้งานทำหรือช่วยให้ประสบความสำเร็จในการ ทำงาน รวมถึงการเลือกเรียนในสาขาต่าง ๆ ของคนรุ่นใหม่ในยุคนี้ ซึ่งถือได้ว่าเป็นยุคแห่งการเปลี่ยนแปลงอันเกิดจากเทคโนโลยีดิจิทัลรูปแบบใหม่ ๆ หรือที่เรียนกันอย่างคุ้นเคยว่า "Technology Disruption" ทำให้การเตรียมตัวเพื่อให้เกิดความพร้อมเข้าสู่ตลาดแรงงานในยุคปัจจุบัน ค่อนข้างมีความท้าทายและมีการแข่งขันสูง ตลอดจนมีการเปลี่ยนแปลงอย่างรวดเร็ว ซึ่งเป็นสิ่งสำคัญสำหรับผู้ที่กำลังจะก้าวเข้าเข้าสู่ตลาดแรงงานจะต้องรู้และเท่าทัน

บทความนี้จึงเขียนขึ้นโดยมีความมุ่งหวังจะให้ข้อมูลเชิงลึก รวมถึงคำแนะนำที่เป็นประโยชน์สำหรับนักเรียน นักการศึกษา รวมถึงสถาบันการศึกษาทั้งของรัฐและเอกชน ตลอดจนนักธุรกิจทั่วไป นอกจากนี้บทความเรื่องนี้ยังฉายภาพให้เห็นถึงกระบวนทัศน์ในการจ้างงานและข้อมูลจากการสำรวจสถานการณ์การจ้างงานทั้งในระดับมหภาคและระดับจุลภาค และยังกล่าวถึงสาขาวิชาที่มีโอกาสและเป็นที่ต้องการต่อการจ้างงานในอนาคตสำหรับนักเรียน ผู้ที่มองหางาน และผู้มีส่วนได้ส่วนเสียที่เกี่ยวข้องทุกภาคส่วนที่สำคัญ บทความนี้ยังกล่าวถึงทักษะด้านความรู้ (Hard skills) และทักษะด้านอารมณ์ (Soft skills) ที่จำเป็นเพื่อแข่งขันในตลาดแรงงาน รวมถึงสาขาวิชาที่ตอบโจทย์การพัฒนาประเทศทุกภาคส่วนเพื่อรองรับนโยบาย Thailand 4.0 ในยุคดังกล่าวนี้เป็นยุคที่มีการเปลี่ยนแปลงทางเทคโนโลยีดิจิทัลที่สำคัญ โดยเฉพาะอย่างยิ่งการใช้หุ่นยนต์หรือเครื่องจักรกลอัตโนมัติทำงานแทนมนุษย์ ประเด็นดังกล่าวนี้จึงเป็นประเด็นที่น่าสนใจสำหรับนักศึกษา หรือผู้ที่

กำลังมองหางานทำ ที่ยังมีคุณสมบัติหรือทักษะบางประการที่ไม่สามารถตอบสนองโลกแห่งการทำงานที่ขยับตัวไปตามนโยบายที่การผลักดันประเทศเข้าสู่ความเป็น Thailand 4.0 และการก้าวไปสู่ S-Curve อย่างไรก็ตาม หากพิจารณาถึงผู้จบการศึกษาในกลุ่มสังคมหรือที่เกี่ยวข้องกับกลุ่มดังกล่าวนี้ โอกาสในการเข้าถึงงานยังมีอยู่อีกมาก โดยเฉพาะอย่างยิ่งงานที่เกี่ยวข้องกับการติดต่อสื่อสารกับคน งานที่ต้องเชื่อมโยงกับการให้บริการผู้คน ตลอดจนงานด้านลูกค้าสัมพันธ์ ยิ่งหากมีความรู้ความสามารถเพิ่มเติมด้านภาษาอังกฤษหรือภาษาต่างประเทศ (เช่น อย่างน้อยสามารถสอบ TOIEC ได้ผลคะแนนมากกว่า 550 ตามที่องค์กรในระดับนานาชาติชั้นนำกำหนด) รวมถึงทักษะที่จำเป็นต่อการทำงานอื่น ๆ อาทิ การคิดวิเคราะห์เชิงกลยุทธ์หรือการคิดเชิงวิพากษ์ การแก้ไขปัญหา และทักษะความเป็นมนุษย์อื่น ๆ

ในโลกยุค Technological disruption ที่จะต้องจับตามองทุกการเปลี่ยนแปลงที่สำคัญอยู่ตลอดเวลา ไม่ว่าจะเป็นการใช้เทคโนโลยีต่าง ๆ มาทดแทนการทำงานของมนุษย์มากขึ้นอย่างก้าวกระโดด อย่างไรก็ตาม ยังมีงานอีกมากมายที่ยังจำเป็นจะต้องใช้ทักษะและความเข้าใจต่อสัญชาติญาณและความรู้สึกของมนุษย์ หรือของลูกค้า ทักษะในการแสดงความเห็นอกเห็นใจในฐานะเพื่อนมนุษย์ด้วยกันในการปฏิบัติงาน ทักษะเหล่านี้ล้วนแล้วแต่เป็นทักษะพื้นฐานของมนุษย์ที่ช่วยให้ผู้ปฏิบัติงานสามารถจัดการกับปัญหาเชิงทัศนคติและเชิงอารมณ์ในงานได้ ซึ่งในยุคปัจจุบัน แม้ว่าเครื่องจักรชาญฉลาด (Intelligent machine) จะสามารถปฏิบัติงานทดแทนมนุษย์ได้อย่างที่เราไม่คาดคิด แต่งานที่เกี่ยวข้องกับทักษะพื้นฐานความเป็นมนุษย์ดังกล่าวข้างต้นนี้ ปัญญาประดิษฐ์เหล่านี้ยังไม่สามารถทดแทนได้

คำสำคัญ: สภาวะการเปลี่ยนแปลงที่เกิดจากเทคโนโลยี ทักษะสำหรับนักศึกษาในศตวรรษที่ 21 ประเทศไทย 4.0

Introduction

Although technology has helped lead in a new level of communication and industrial development, it is inevitable that robotics and automation controlled by artificial intelligence (AI) will eventually start performing human jobs someday, affecting the unskilled workforce and college graduates who cannot adapt to new technological changes. Hence, job losses resulting from the digital transformation are at our doorstep...a case to take into consideration, in 2017, Fukoku Mutual Life Insurance in Japan laid off employees, replacing them with an AI system that can calculate insurance payouts for clients. As for Thailand, there have not been any significant changes in the jobs industry attributed to AI just yet, but that future is unavoidable because the country has implemented Thailand 4.0 agenda (Fourth Industrial Revolution) to move towards digitization. According to PricewaterhouseCoopers Consulting Thailand www.bangkokpost.com./businessbiznews it estimated that 45% of work activities can be automated as emerging technologies will help business to increase productivity, save costs and efficiency with no need to expand workforce size. As workplaces and companies become more and more automated, ones can't overlook the potential issue

of employment being disrupted by robots and AI's capabilities of replacing humans and workforce. To serve as a guidance for job seekers and targeted careers for which job seekers could avoid to compete head on with the potential disruptive forces. A recent article on www.bangkokbiznewscom stated that...Thailand is among 5 other ASEAN countries faces a potential risk of losing job opportunities due to robotics presence and AI disruptions. With this being a focal point to be concerned, it is imperative that future workforce be prepared and be adaptable to cope with these disruptions. In addition, the article also provides useful information with regards to job possibilities for social sciences and related majors of studies, which undoubtedly could face extreme tough challenges in landing a job due to oversupply of graduates versus demands... meaning low-skilled, foreign language/technology incapable candidates would find it very difficult to compete with higher-skilled ones, let alone having to compete with robots and automation. Added into the equation regarding lukewarm domestic consumption, domestic political and global economic uncertainties, trade tensions between China and the U.S., college graduates and job seekers with irrelevant skills, not well-equipped with IT/digital, foreign language skill (s), and importantly critical/strategic thinking/creative skills, and people management, will unlikely land a decent job given negative aforementioned outlooks, plus possible disruptive impact from robotics and AI, which could make humans redundant, especially for routine functions and repetitive tasks. With the future employment landscape is tilting towards high technology, high skills and knowledge-based driven to drive the country's economy, it is significant for job candidates be well-rounded and well-versed in order to be employable. To sum up, the key content and analysis in this article offer a useful guidance for the said stakeholders involved to deal with the future employment issues as well as ways & means to prepare for the ever increasing jobs competition and technological disruptions,

Primary content & Literature reviews

As per Udom Kachinthorn, Deputy Minister of Education's statement, " if Thai universities do not adapt and cannot build a workforce with future-proof skills, the country may have to face with records breaking rate of unemployment." By 2030, 72% of university graduates in Thailand could be either unemployed or working in a job that does not require a bachelor's degree (overqualified), such as convenience stores clerk, hypermarket/modern trade stores staff or similar nature due to the risk of getting replaced by AI and robots. As a result, administrative and office workers who lack all, but routine skills are at the highest risk of being made "redundant". A study by (Crabtree, 2018) cited that low-skilled industrial functions as

among the most susceptible to automation and pose a high risk of getting replaced are plant operators, metal/factory workers just to name a few.

Regarding future job prospects in Thailand, jobs that could be replaced by robotics/automated machines and AI, and are categorized as Falling Stars are: routine administrative functions, such as data entry staff, secretary, stock inventory worker, manufacturing worker, and surprisingly counter sales clerk/cashier because of rapid growth in e-commerce businesses, and for some staff in banking industry FINTECH will likely make their jobs disappeared. Supported by an article in Thansettakij on-line (2019), which stated that in the foreseeable future, bank tellers would be replaced by AI, and eventually be forced to sell the ever-difficult financial products and insurances instead (in a highly competitive and already crowded markets).

According to CISCO/Oxford Economics' survey, from 2018-2028 approximately 4.9 million jobs, roughly 12% of total workforce in Thailand will be displaced by advanced technology. Considered as a threat, it is advisable that job seeking candidates need be able to strategically and critically think out of the box, and sharpen oneself with complex problems solving skills. Furthermore, the study reveals that possessing strong command in IT skills, human interactive skills are of essence, particularly jobs that involved negotiation, persuasion and customer service which robots and machines are incapable of.

A case in point regarding labor wages versus AI costs in the manufacturing sector that could have a negative effect on global manufacturing wages scale, a research by Pew Research Center in 2018 indicated that... the labor cost of using robots in manufacturing is about $4 per hour compared to a manufacturing hourly wage cost in the U.S is approximately $36, and $49 in Germany. According to the Organization for Economic Cooperation and Development (OECD), it estimated that 14% of jobs in advanced economies could become susceptible to automation. Although this would unlikely impact Thailand's overall manufacturing/labor costs just yet as the current minimum wage is... to a certain extent, still manageable. For Thailand's average monthly wage, at present stands at 14,000 baht per month, nevertheless it is possible that companies may be willing to invest in AI/Automation to replace workers in the foreseeable future, should they found it feasible and more cost effective in the long term.

To put into perspectives, as AI becomes increasingly sophisticated, more applications will be adopted and transformed. This will have an impact on industries where the skills required can be easily machine-learned/machine-capable to improve bottom line cost and productivity. In countries where technology adoption is rapid, jobs in contact centers or

Business Process Outsourcing units (BPO) could be vulnerable, such as the Philippines, followed by Thailand and Indonesia respectively.

According to a study by ILO (international Labor Organization) as for Thailand it had assessed that up to 98% of workers could be replaced in what it believed were the most at-risk and vulnerable occupations, these were: subsistence farmers, farm laborers, retail sales assistants, livestock and dairy producers, food counter attendants, office clerks; and junior accounting/entry level staff, and auto-industry workers, subsequently could affect approximately 9.2 million jobs. On a manufacturing aspect, according to a report by Bank of Thailand in 2017, it revealed that automobile factories would prefer to use automation and robots in production lines, for examples, forming and welding which they believed would prevent and/or mitigate labor shortage, and helped easing personnel related matters.

A case in point:According to www.nationmultimedia.com, a report by (Srimalee, 2019) written about KTC Plc., a KTB Plc's subsidiary, it cited that: for the company to sustain business growth, it had created a system to develop Robotic Process Automation (RPA) to streamline the company's operations, which would be implemented first in the accounting department, before it was rolled out to other areas of the company with the goal to speed up and to scale the overall business processing efficiency by up to 70%, as part of the company's drive to entrench sustainable growth. With this, some employees in various accounting functions would possibly be removed from the jobs.

Separately, the online job search platform, www.jobthai.com which had conducted an analysis of job search statistics throughout the country, it had found that sales, technicians, manufacturing, quality control, administration, purchasing as well as imports and exports, human resources, health, aging related businesses, nutrition, science & research, transport and logistics were the categories that expected to grow the most in 2019. In addition, the website indicates the significance of having strong foreign languages skills, which are and will be in high demand. These language skills are English, Mandarin Chinese, Japanese and Korean. It also revealed the jobs that were believed to attract labor workforce such as sales representatives for insurance products/sales representatives to sell customized robots, elderly care/care giving, skilled technicians, production/quality control administration, procurement, hybrid/EV (Electric Vehicle) automobile engineering, and accounting, conditioned that the job candidates possess competent foreign language skill (s) to go along with hard and soft skills.

- **Analysis and future careers scenarios**

The availability of modern technologies has changed the way we live our lives as well as our social, environmental and economic conditions in a profound way. These modern technologies have also created several new desired careers in the labor market. On the global scale, it is projected that in the year 2025, 60% of the workforce will work in the careers that do not currently exist.

Based on research results from Citi Research and Thai labor market trends, Adecco (Thailand) found that the hottest careers in the year 2025 would primarily be in engineering, renewable energy, health care, science, and IT/Digital technology-related lines of work:

1. IT & Digital: When the world is powered by technology, everything becomes digital; shopping online, online banking, including currency that becomes cryptocurrency. Many businesses and services are using Artificial Intelligence (AI) to obtain or sustain a competitive advantage. Clearly, IT & digitally related careers that involved the Internet, Big Data and AI will see upward trend, and are likely to continue surging.Those careers refer to: programmer, software developer, data analyst, cyber security analyst, database specialist, data scientist, computer systems analyst, and digital & e-commerce marketer.

2. Engineering & Robotics: Manufacturing industries with large production bases tend to use more AI and automation in their production lines to enhance productivity and save overheads, to resolve labor problems, and to create new innovations to add values to their products and services. Engineering positions, thus, becomes highly needed, especially in computer innovative engineering, energy & electrical engineering, AI & Robotics engineering as well as mechatronics. These engineering jobs will play an important role not only in developing the country and quality of life, but also in building a computer system that responds to economic and social development, for instances, the development of automation and machinery in the factory, the development of electric vehicles, self-driving cars, and robots for work.

3. Healthcare/Personal Care: The world's population is aging, Thailand for one. The information from the United Nations (UN) had revealed that, in the next several decades, more than 30% of the people around the world would be over 60 years old. In the meantime, the average life expectancy tends to increase due to the advances in medical technology. As a result, professionals in this healthcare and personal/elderly care, without a doubt, will be in high demand. Apart from these, new careers such as bioinformatics technician, nuclear

medicine technician, medical instrument technician (or biomedical equipment technician) will also be needed.

Regarding the labor aspects related to workforce, Apisitniran L. (2019) wrote on Bangkok Post that...the country's higher education system needs an overhaul because the labor market lacks manpower in the STEM (science, technology, engineering, mathematics), it also stated that the country's short-term labor outlook would see the number of staff at financial institutions and banking industry gradually decline caused by digital disruptions from mobile banking apps, internet banking and Fintech, whilst the government's 4.0 policy (Fourth Industrial Revolution) which is an economic model based on creativity, new technology and high-value/innovative products, high-quality services in order to serve as "competitive growth engine"with a goal to unlock individuals from middle-income and inequality traps. The model has put high emphasis on promoting 12 targeted industries for EEC (Eastern Economic Corridor), the industries which comprise of: new-generation automobiles/electric vehicles, smart electronics, affluent/medicaland wellness tourism, value-added agriculture and biotechnology, food, robotics for industry, logistics, defense, and education (most of these fields are in STEM-related education), while other areas such as political science, liberal arts/social studies, mass communication, philosophy, and economics and similar disciplines were projected to be declined.

On a related matter, according to Theparat C. (2019), demands for human resources and staffers in the government's 12 targeted industries is estimated to be more than 1 million jobs over the next 12 years (2019-2030) based on the latest study by the Eastern Economic Corridor (EEC) policy committee, approximately the tourism industry is expected to require 300,000 workers, digital 280,000, robotics 96,000, medical 95,000, and logistics 90,500. In addition, the aviation and parts industry is projected to need 58,000 staff, smart electronics roughly 56,000, smart automotive 55,000 estimated, the food industry predicted to require 45,000 and value-added/high-valued agriculture and biotechnology at about 15,000.Regarding short term projections (2019-2023), vocational level approximately 250, 000 jobs is projected to be needed, followed by bachelor level for 210,000 jobs and post-graduate level for 10,000 jobs. According to EEC Labor Administration Center executive, more experts in digital skills will be highly sought after because they can be allocated in every targeted industry, as many companies are also adopting digital technologies. On a big picture perspective, new-jobbers with a degree/diploma in STEM fields or related disciplines will likely be more marketable and preferable over other non-STEM majors. Complemented a hard skill with foreign languages skill

(s), job candidates will definitely have an edge as bilingual workers will be highly sought after, even neighbor/cross-border language is helpful thanks to the current government's policy of attracting foreign direct investment and continuously promote tourism, therefore it is recommended that non-STEM job seeking candidates equip themselves with the much-needed tangible and intangible skills.

- **Education related to workforce and skills improvement**

According to Hansen M. (2018), he cited that... sounded education is the key tool to manage and deal with the challenges.The economy of the future will be driven by innovative knowledge, technological-oriented, and market-demanded skills set in order to support innovative trends and contend with disruptive technology. Avirutha (2018) indicated in his article that: Thai entrepreneurs should be well prepared to upgrade their employees' skill, specifically in business data analysis. In addition, the potential employees should gain skills and cross-sector experience that complements their capabilities in which digital and technological skills should be considered a complementary to proficiency and literacy as digital literacy is an essential tool that supports other subjects and their tasks and job activities, hence enable to facilitate and support sound business decisions. That said, education reform and skills training will play a vital role in enabling people to counter the wave of change and give them the skills they need for the 21st century jobs as this could be done by ways of consolidating schools and equipping hub schools with the necessary-skilled teachers, resources (for example upgraded IT system, provide training support and prioritize computer program as a core curriculum) to support the country's IT workforce, and in the long run help reduce inequalities and disparities in education in line with Thailand's National Education Strategy 2017-2036 (strategy no. 4) which lists equitable education as one of its top priorities.

According to Sasiwuttiwat S. (2018), cited his interesting remark, it said..."Thailand's basic education system focuses too much on subject content while education for the 21st century needs to focus on attitudes, skills and knowledge ("ASK").

- **Employment and relevant skills: Analysis**

According to Equitable Fund for Education Office (Gor Sor Kor), a government agency appointed by the government in 2018 to provide funds for underprivileged vocational/technical and tertiary students to support their education with a goal to reduce income inequalities, which has been a major obstacle impeding the country's economic growth. It pinpointed that the proportion of qualified and high-skilled graduates with a

bachelor's degree in all jobs in the workforce in 2017 accounted for only 16% of the total workforce of approximately 37.5 million workers, while 60% of graduates with bachelor's degrees had entered the workforce, hence created "Qualification Mismatch". As for vocational fields, the employment market had a high level of the vocational graduates combined for 28% of the total labor demand. However, a problem of "Skills Mismatch" had existed because of high number (approximately 74,800) of unemployed graduates with vocational certificates/diplomas accounted for 17% of the total unemployment in 2017, echoing a high percentage of low-skilled workers, not meeting employers'qualification requirements. As a consequence, the country's labor market could have experienced by the so-called "Fields of Study Mismatch" due chiefly to 70% of Thailand's secondary school students, on average prefer to enroll in liberal arts/humanities and social studies, while approximately 30% choose to enroll in Thailand 4.0-driven STEM-related majors with such fields accounted for 41% of the entire employment demand on the market. Correspondingly, a recent survey by the Federation of Thai Industries has found that besides the need for engineers, many companies are demanding vocational staff, such as technicians as they match the government's promoted industries. To address the skills shortage, with structural education reform in needed administration and put importance on performance-based quality assessments for teachers, educators and personnel involved with a goal to support S-Curve related policy to uplift up-country students and teachers' competitiveness, thus creating a fair level of playing fields for them to competitively compete with urban peers, helping to fulfill future the demands of the jobs market.

In a nutshell, placing more capable teachers and improved resources into rural disadvantaged schools would allow the schools to produce better-educated students, whom could subsequently excel in the workforce in line with the country's 12th National Economic and Social Development Plan (2017-2021) to develop the country towards "Thailand 4.0".

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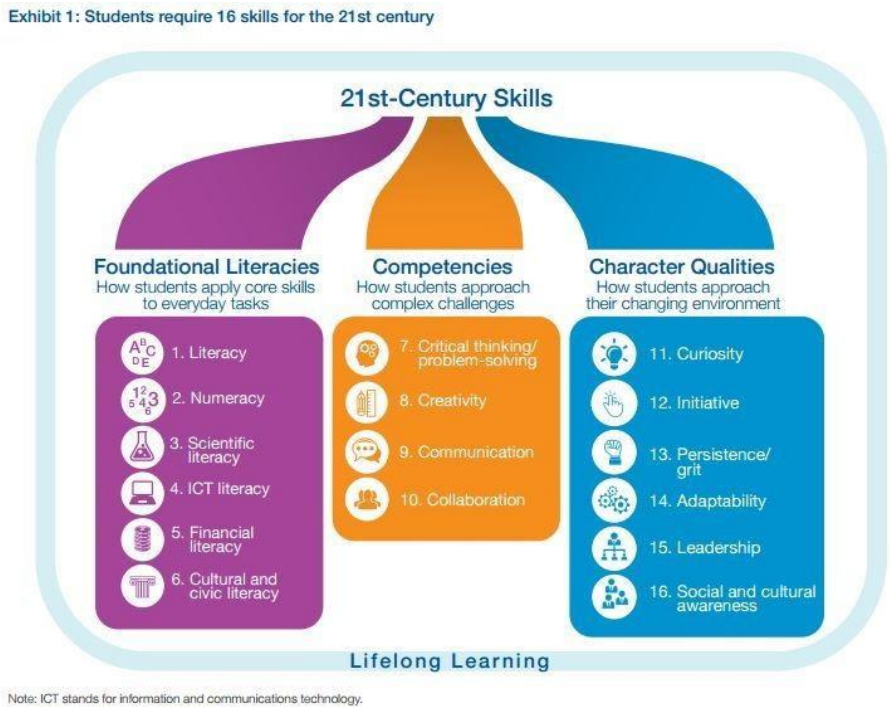

Source: Citi research Adecco.co.th

- The Importance of human skills: Building personal immunity and competence to deal with technological disruptions.

As smart machines seem to be gradually taking the place of humans, 'human skills' have become increasingly significant.Technically, these are the skills that are difficult for the machines to replicate. The advantageous attributes are defined as:

- Creative problem solving: It is the ability to look at problems from different perspectives and dimensions, think out of the box, and come up with an effective solution is a valuable skill to have, given the increasing number of technological innovations that could crop up in the next decades. Rationally speaking, at the end of the day bosses always prefer to hear about the solution to the problem rather than to hear about the problem.

- Making sense of huge amounts of data will also be a huge factor of candidates who are looking to enter IT sector, as more decisions will be based on data gathered from mobile devices based on usage of technology. Aspiring software developers and programmers need to cultivate a deep sense of critical thinking coupled with strength in human interactions in order to gain upper hand. While numeracy and literacy skills are foundational, the other skills needed to thrive in the future are related to cognitive functioning and developing human relations at work. This refers to emotional intelligence, which is the ability to recognize and understand the emotions of oneself and co-workers, have empathy towards others, and be

able to smoothly collaborate with others, a team-oriented person/team player not a one-man-band type is ...indispensable!

- Negotiation, service-oriented, serviced-minded, and be able to work in multidisciplinary manners.

Analytical and value-added skills needed for the future

Based on recent World Economic Forum (WEF) report, it predicted that by 2022 the proportion of humans and machines or algorithmic interoperability would be about 58% and 42% respectively. With this prediction, new skills related to innovation and applications of technology will be required. For Thailand, WEF had conducted a survey and summarized 4 essential skills and meanings which job seekers must equip/evolve themselves in order to stay competitive:

- Analytical thinking skills: data analysis and logical thinking ability to identify the causes of various problems, the ability to adapt or create new ideas to solve work-related problems. This is also related to the ability to search and produce practical ideas that lead to correct decision-making which is viewed as an integral part of design thinking when develop innovative products and services. Sithsungnuen C. (2018) defines thinking skills as the process of thinking is significant due to the fact that everyone who possesses the skills is able to develop oneself and find solution (s) to the problem.
- Complex problem-solving skills: applying knowledge, skills and experience to identify problems, and find ways/solutions to solve or even develop more effective work methods at workplace.
- Active and lifelong learning skills: (pro-active, quick response, accountable and hands-on) learning skills through actions, walk the talk, and be able to apply what has been learned to solve issues.

Conclusion

As writer and futurist, Alvin Toffler, once said, “The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.” The coming of the Fourth Industrial Revolution will undeniably disrupt many industries to a certain extent, and perhaps destroy many jobs, but it does not necessarily spell doom. Investing in the skills that will still be relevant even after 5 or 10 years from now is a constructive move in securing a spot in the workforce of today and tomorrow.”

To put into perspective, hard skills can be learned, but soft skills like positive attitude, right mindset, and people management are what set people apart from those intelligent machines. Without such human side of traits, job opportunities would be bleak and limited due to ever increasing and advancement of digital and disruptive technologies. For job seekers and college graduates with degrees in social sciences and non-scientific/non-engineering related facets, apart from possessing strong soft skills, it is also advisable that he or she equips oneself with the meaningful skills, that is: sound IT/digital knowledge, skills in on-line selling and promoting products and services as well as handling and managing customer services thru Social Media platforms/applications, and undeniable...foreign language (s) skills, particularly English followed by second language such as Chinese, Japanese or Korean or even ASEAN neighbors' language, especially for those who live near the borders-crossing areas are advantageous and gainful.For manufacturers, skills retraining for employees to catch up with advanced technologies would help sharpening and upgrading their employees'skills in order to stay relevant and potentially reduce "Skills Mismatch". On a macro scale pertained to addressing skills competence, bridging education gaps to improve quality of teachers and students in dealing with disruptive technology and ever challenging employment landscape...structural education reform with the goal to support S-Curve policy to raise rural students and teachers 'competitiveness, consequently create a fair level of playing fields for stakeholders to competitively compete with urban peers, thereby reduce income inequalities and social problems, whilst improve the country's competitiveness in the world rankings, attract foreign investment, raise G.D.P., hence enable the country to move away from being a middle-income trap nation.

On a micro scale, for schools, vocational and educational institutes, it is necessary that the curricular are produced to enhance the skills required for Thailand 4.0, and correspondingly, result-oriented/performance-based/students-centric/pro-active learning and teachings be carried out in accordance with employment demands, and able to serve the skills required for the 21st century. Last but not least, according to Karnjanakantikul S. (2019), manager/Manpower Group (Thailand), her useful opinion stated...jobs prospect are not that gloomy and still has windows of opportunity for those who will graduate or already graduated in the social studies or the likes as there are opportunities available, however it is recommended that one should not be too choosy about selecting the job, just need to adapt and continue to improve on the required skills such as IT, digital technology, and foreign language (s). A key factor to keep in mind, learning technical and hard skills related to your

field is a terrific thing, but you also need to be able to have other skills that allow you to adapt quickly. That said, hard skills allow you to get the job done. But without soft skills, you won't be able to get it done faster and more effectively. Given how important speed has become in our world, you can no longer depend on hard skills alone if you want to stay ahead of the crowd.

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