LUANGSOMBATH et al. (2021). Souphanouvong Journal of Multidisciplinary Research and Development
ISSN 2521-0653. Volume 7. Issue 1. Jan – Jun 2021. Page 29-34.

The impacts of advanced digital technologies on workplaces and workforce

Soulichanh LUANGSOMBATH [1], Thiphachanh NOUTHAPHONE[2], Bounmy PHALYCHAN[3], Khounmy VINNALATH[4], Somphane SYSAVATH[5], Khounmy VINNALATH[6], Manivone PHENGSOM[7] and Chansy PHOMPHITHAK[8]

The Office of Education and Sports, Naxaythong District, Vientiane Capital

[1]Corresponding Author:
Soulichanh LUANGSOMBATH, The Office of Education and Sports, Naxaythong District, Vientiane Capital
Tel: +856 020 28899883, e-mail: chanhluangsombuth21@gmail.com.

[2,3,4,5,6]Champasuck University
[7]University of Health Sciences
[8]Champasak College of Health Science

Article Info:
Submitted: Mar 30, 2021
Revised: May 25, 2021
Accepted: Jun 2, 2021

Abstract

Advanced digital technology is influential in working areas because of the efficiency to deliver working performance and gain more outputs. Technology is pervasive in aspects of works. It requires employees to have the knowledge and the ability to apply it to facilitate their tasks. This study aims to explore the impacts of advanced digital technology in the workforce and workplaces. The location site of research is the education department of Naxaythong district. The sampling group comprises 30 who have worked related to technology. The survey applied a questionnaire to collect the data. Questions are designed on Google form to facilitate data collection. For data analysis, researchers deployed a computer program as SPSS to analyze the data. The study found that digital technology knowledge is essential in the workforce because it empowers working performance. The workforce requires the ability to utilize technology to increase work output. It can decrease the number of time employees spends on repetitive tasks. Nevertheless, the unskilled workforce tends to lose their job opportunity to get a job and promotion when they lack knowledge of digital technology.

Keywords: *Advanced digital technology, workforce, workplace, potential skills.*

1. Introduction

Technology can be broadly defined as "the state of knowledge concerning ways of converting resources into outputs" or as the "machinery and equipment developed from the application of scientific knowledge" (Oxford English Dictionary). Workplace automation is a broad term that captures a very wide range of changes taking place in all sectors including manufacturing, mining, agriculture, retail, logistics, warehousing, and more. Each sector has a different story about how automation is or is not being adopted; why; and with what impacts. Due to the many studies concerning the development in technologies and decreasing or increasing employment, it appears likely that a lot will change in the work field. Due to this, organizations need to anticipate and prepare for this development. Nevertheless, it remains unclear for organizations which developments they should adopt. The term technological developments can be interpreted in many ways. It includes robotization, automation, and computerization. The boundary between them is, due to new technologies, difficult to distinguish. For this study, the following definition for technological developments from (Upcoming) is used: 'Developments in which

business processes, by the use of technology, are redesigned and human labor is (partly) replaced by smart machines.'

Increased digitalization and automation are expected to significantly affect both the quality and quantity of jobs. New types of jobs and employment are changing the nature and conditions of work by altering skills requirements and replacing traditional patterns of work and sources of income. They open opportunities, especially for developing countries, to enter new, fast-growing sectors and catch up with more advanced economies. At the same time, new technologies are affecting the functioning of labor markets and challenging the effectiveness of existing labor market institutions, with far-reaching consequences for the number of jobs, their quality, and the diversity of opportunities they offer. The impact of technology on work and workers also should be considered as a process that occurs over time. Hence, it appears important to understand the extent of the process according to specific times. The speed at which technology is modifying work is believed to be increasing, although it will not happen everywhere all at the same time. There will be differential transitions by country, region, sector, occupation, task, and type of technology. While yielding positive benefits to some parts of the workforce each transition process is likely to create negative physical and psychosocial impacts in the workforce due to the precariousness of work and the perception of a potential lack of opportunity for workers to evolve with a job or be positioned for a new one (Leso et al. 2018; Stacey et al. 2018). Such technology-induced reallocations affect workers differently, depending on their skills or on the tasks they perform. ICTs tend to be used more intensively and more productively by skilled workers than by unskilled workers. Technology tends to affect routine activities more than non-routine activities, because machines still do not perform as well as humans when it comes to dexterity or communication skills. The concerns of technology causing mass unemployment, due to machines replacing human labor, are hardly new in history. In fact, the idea of "technological unemployment" as a new disease was already highlighted by John Maynard Keynes in 1930.

According to the unskilled workforce in technology application in the workplace, they need to seek the opportunity to instill their technology competency. As people make education and career choices, it will be important for them to be made aware of the factors driving automation in particular sectors, to help them identify the skills that could be useful for them to acquire from a labor-market perspective, and what activities will be complements of activities that are likely to be automated. Education institutes require to take responsibility to instill graduates with essential skills in work performance. Unskilled workers tend to risk employment when they are lack certain skills for the workplace. Moreover, high-skill workers who work closely with technology will likely be in strong demand and may be able to take advantage of new opportunities for independent work as the corporate landscape shifts and project work is outsourced by companies. Middle-skill workers whose activities have the highest technical potential for automation (predictable physical activities, collecting and analyzing data) can seek opportunities for retraining to prepare for shifts in their activities toward those that are complements of activities the machines will start to perform. Low-skill workers working with technology will be able to achieve more in terms of output and productivity but may experience wage pressure given the potentially large supply of similarly low-skill workers.

As a result, education systems will need to evolve for a changing workplace, with policymakers working with education providers to improve basic skills in the STEM fields of science, technology, engineering, and mathematics and put a new emphasis on creativity, as well as on critical and systems thinking. For all, developing agility, resilience,

and flexibility will be important at a time when everybody's job is likely to change to some degree. An important consideration is to raise the level of workers' education (both initially and continuing) so that they can undertake the higher-level jobs required by automation. Therefore, the researcher is interested in the impacts of advanced digital technology on workplaces and the workforce.

2. Materials and Methods

2.1 Participants

This survey examines the impacts of advanced digital technology on the workforce and workplaces. The survey aimed at exploring people who currently work in technical roles within the ICTs area. The population who has worked for district educational office comprised of 67 people, but researcher selected only 30 participants who work only related technology utilization. Additionally, these target group have work experience more than 5 years in working with technology.

2.2 Data Collection

This quantitative study was completed using a questionnaire that contained two parts. The survey was divided into two parts. The first part collected demographic data about the participants including general questions about working experience and the frequency of using technology in their work. The second part included impacts of advanced digital technology on the workforce and workplaces, challenges associated with workforce skills fill in the workplaces, and potential skills for the workforce and workplaces. Sugiyono (2015) states that Questionnaire is one of data collection technique which is done by giving a set of questions or written questions to the respondents to answer. Along with the times, the questionnaire became an inevitable need in survey. The survey of second part was checkbox questions that respondents can select more than one answer according to their experiences in technology deployment. The questionnaire was constructed in Google form and distributed to participants to respond. Researchers selected this tool for creating questionnaire because of fast accessibility and responsiveness. Questionnaire in the form of paper is a kind of manual technology and there are several advantages of digital questionnaires. Digital questionnaires directly provide the results of respondents' responses (Batubara, 2016).

2.3 Data analysis

The data was coded after researchers obtained information from participants. It was coded and analyzed by describing on what they replied or answered the questions. Researchers applied computer as SPSS program to analyze data, then it was tabulated and described respectively.

3. Results

This section described the results of data collection with the target group. The data was tabulated and in interpreted.

3.1 The impact of advanced digital technology on workforce and workplaces

It can be said that advanced digital technology has dramatically changed workplaces according to the available technologies. Employers have implemented automation technology to reduce the workforce in workplaces. This action results in job loss through the replacement of human workers, unskilled workers, particularly. Technology also reduces job opportunities for people facing multiple barriers to employment, for example, disability and poor dexterity workers. Besides, it can reduce the number of time employees spend on repetitive tasks. Thus, it is implemented to reduce the time consuming of the workforce. However, the benefits of technology incorporation in production are to increase productivity within a workplace and facilitate parts of employees' jobs easier. Automation technology raises production and helps the workforce to handle their difficult tasks (see table 1).

3.2 Challenges associated with workforce skills fill in the workplaces

Skills and abilities in the workforce are essential for employees. They need to have certain knowledge and skills to perform their duties in the workforce. This section describes the challenges related to workforce skills complement in the workplaces. Certain skills are losing in the workforce such as hybrid skills in technology, engineering, and mechanics. These skills highly demand to fill the job performance but they rarely find in the workforce. This is a reason why many workplaces tend to implement technology to perform work because in some places employers struggle to fill jobs because people do not have the new technological skills they are looking for. Besides, colleges and universities did not have prepared this workforce to fill current workplaces that highly demand employees who know digital advanced technology. Some employers think some working are educated or learned for the right kinds of jobs that workplaces need (see table 2).

3.3 Potential skills for workforce and workplaces

Essential skills highly require for workplaces because they need different skills in the working environment, especially, adaptability in different pressure situations. When employees have to work with different background colleagues, they need to learn and work with other sides. This includes soft skills that the workforce needs to fulfill their work performance. Moreover, complex problem-solving, reasoning, ideation, creativity, origination, and initiative need to handle the problems that occur in the workplace. Also, Leadership and social influence are potential skills that employees need to have when they take responsibility in the workplace. Furthermore, they are courageous to make their own decision when they are under pressure situations with analytical thinking and able to anticipate what happens consequently. According to the transformation of technology every day, the workforce needs to learn the different programs and able to use them professionally to gain more job opportunities and promotion. However, emotional intelligence is also important for the workforce and helps them to meet achievement in working life (see table 3).

4. Discussion

Advanced digital technology affects not only job numbers in the workplaces but also impacts on incomes of employees when workplaces have more allocated technology in working areas. Job replacement by technology is not new when digital advanced technology empowers in working performance. It has disrupted all the sides of working areas, especially, industries where the human cannot perform dangerous tasks. To meet the criteria of job requirements in the workplaces is vital for the workforce to obtain certain skills to accomplish their tasks, particularly, digital savvy. The evidence suggests that the type of knowledge, skills, and abilities required by organizations will change. For example, the need for routine cognitive and manual skills is decreasing, while the need for non-routine cognitive and manual skills has increased (Autor et al., 2003). There is also considerable evidence that organizations are increasingly offering flexible working practices in order to meet employees' needs and to reduce costs associated with having a physical workplace (Berkery et al., 2017; de Menezes & Kelliher, 2011; Stavrou et al., 2015). According to the influential digital technology on the workforce and workplaces, employees need to be prepared for a career, not just a job and have the ability for life-long learning to adapt and upgrade their skills to ever-changing environments, especially, digital savvy for working.

5. Conclusion

Advanced digital technology is the potential to perform tasks in the workplace and workforce. Technology knowledge encourages the workforce in job recruitment and high payment for their capability. Not just digital technology knowledge for specific tasks that the

workforce should have but they also need critical thinking and problem-solving skill in the working. Technology ability is vital to deliver working performance. As a result, the workforce needs to be tied to advantaged digital technology. Also, they need to learn complex problem-solving, reasoning, and initiative to be professional in leadership in advanced technology for work. However, poor digital technology knowledge of the workforce is likely encountered with job recruitment or even unemployment. They will lose opportunities to get promotions in their organization.

6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

7. Reference

Autor DH, Levy F, Murnane RJ: The skill content of recent technological change: An empirical exploration. *Q J Econ.* 2003; 118(4): 1279–1333.

Batubara, Hamdan Husein. (2016). Penggunaan Google Form sebagai Alat Penilaian Kinerja Dosen di Prodi PGMI UNISKA MUHAMMAD Arsyad Al Banjari. Al-bidayah: Jurnal Pendidikan Dasar Islam, 8 (1)

Berkery E, Morley MJ, Tiernan S, *et al.*: On the uptake of flexible working arrangements and the association with human resource and organizational performance outcomes. *Eur Manag Rev.* 2017; 14(2): 165–183.

de Menezes LM, Kelliher C: Flexible working and performance: A systematic review of the evidence for a business case. *Int J Manag Rev.* 2011; 13(4): 452–474.

John Maynard Keynes, "Economic Possibilities for our Grandchildren (1930)," in Essays in Persuasion (New York: Harcourt Brace, 1932), 358-373

Leso V. The occupational health and safety dimension of Industry 4.0 Medicina del Lavoro 2018; 109, 5: 324-338.

Stacey N, Foresight on new and emerging occupational safety and health risks associated with digitalization by 2025.

Stavrou ET, Parry E, Anderson D: Nonstandard work arrangements and configurations of firm and societal systems. *Int J Hum Resour Man.* 2015; 26(19): 2412–2433.

Sugiyono. (2015). Metode Penelitian Pendidikan. Bandung: Alfabeta

Table 1: The impact of advanced digital technology on workforce and workplaces.

No	Content	Frequency	Percentage
1	It may result in jobs lost through replacement of human workers, especially low skilled employees.	14	46.7
2	It may also result in jobs gained through increased productivity within a workplace.	9	30
3	It can reduce the amount of time employees spend on repetitive tasks	15	50
4	It can make parts of employees' jobs easier.	13	43.3
5	It may result in jobs replace unskilled and poor dexterity workers.	8	26.7
6	It can reduce job opportunities for people facing multiple barriers to employment, for example, disability.	19	63.3
Total		78	100

Table 3: Challenges associated with workforce skills fill in the workplaces

No	Content	Frequency	Percentage
1	In some places employers struggle to fill jobs because people do not have the new technological skills they are looking for.	15	50
2	Certain skills are missing in the workforce - hybrid skills in technology, engineering, mechanics.	15	50
3	Some workplaces not only require soft skills in workplace but they also need critical thinking and solving skills.	23	76.7
4	Some employers think some working are educated or learned for the right kinds of jobs that workplaces need.	18	60
Total		71	100

Table 3: Potential skills for workforce and workplaces

No	Content	Frequency	Percentage
1	Adaptability	15	50
2	Agility	9	30
3	Analytical thinking and innovation	11	36.7
4	Complex problem-solving, reasoning and ideation	19	63.3
5	Creative thinking and analysis	15	50
6	Creativity, origination and initiative	14	46.7
7	Emotional intelligence	8	26.7
8	Leadership and social influential	13	43.3
9	Technology design and programming	12	40
10	Soft skills	15	50
Total			100