

## Digital literacy and adoption of Information and Communication Technologies in the Japanese Education System.

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**ABSTRACT:** This paper will try to analyze the current situation of digital literacy (DL) and the adoption of Information and communication technologies (ICT) in Japan. To do so, it will focus on 3 important areas in Japanese society: Government, Businesses and Educational entities. It will also present the case of the Kanda Institute of Foreign Languages as a center dedicated to digital literacy among its students.

**KEYWORDS:** Digital literacy Information and communication technologies Japan Technology adoption

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### 1. INTRODUCTION

Japan is regarded as a country with a vast number of ICT infrastructure. It is also true that Japan has a remarkable market in technologies and gadgets. Unfortunately, this adoption of ICT does not directly translate to the rise of productivity (Ministry of Internal Affairs and Communications, 2008, Shinozaki and Yamamoto, 2009), and in the educational and medical sectors it still remains mediocre at best (MIC, 2009). While it has one of the world's best infrastructure, Japan is not able to fully take advantage of such vast infrastructure in areas like public service. This paper will explore

3 areas in Japanese society which are directly impacted by the lack of digital literacy and the adoption of information and communication technologies.

### II. ICT & DL IN THE GOVERNMENT :

People's confidence in government underlies the extent of the adoption of ICT. Unfortunately, the government has made little progress in reforming internal operations and information systems. Subsequently, they are unable to provide services that are useful to citizens and businesses, preventing the rate of use of technology from rising. The government places emphasis on cost reductions in each system, and no framework to measure the cost effectiveness of introducing a system has been established. Other issues have accumulated: for example, the PDCA (Plan, Do, Check, Act) cycle is not functioning, and it is not clear which entity is in charge of achieving goals. The structure of the Japanese government also establishes a challenge to ICT adoption. Japan's IT Strategy Headquarters is a cross-agency organization, positioned immediately under the Cabinet Secretariat. However, the organization consists of those who are sent from various government agencies and it has not been able to take sufficient initiatives (Igari, 2014). Historically, the government agencies in Japan have acquired their information systems separately. Therefore, systems are not optimally set up for the government as a whole. Government agencies in charge of health care and education show strong independence, and there is no structure for cooperating toward a unified digitization. In addition, national strategies for different fields do not center on ICT, and mechanisms for proactively promoting ICT usage have no foundations to gain momentum.

The turnover of people in charge also remains a problem. In Japan, fifteen different people have become the minister in charge of ICT issues during the 10 years between 2000 and 2010 (Igari, N. 2014). Under these circumstances, it is difficult to propose and plan consistent strategies and policies and follow through the PDCA cycle. The Japanese government is incapable of providing businesses and citizens with clear incentives for digitization. Also, the country's emphasis on serving those who do not have sufficient Internet access and digital literacy prevents the elimination of paper-based processes at government offices and a unified transition to digitization. The country also has a culture of not pursuing mandatory measures. In regards to service development, the Japanese government does not attach importance to users' perspectives of the design and system structure, which would help increase service usage rates. In general, the approach from the government to ICT adoption has been stopped by their lack of DL and their archaic methodologies.

### **III. ICT & DL IN CORPORATIONS & BUSINESSES**

Corporations and businesses have also seen problems with the adoption of ICT and DL, although for different reasons. One element is that it is too costly for small firms to have their own ICT service division, having access to efficient vendors of ICT services is a key factor for procuring ICT inputs at a reasonable price; however, in Japan, the market for business process outsourcing (BPO), which includes outsourcing of ICT processes, is not well developed. (METI 2014b). The Japanese labor market shows limited fluidity for regular workers, because of the prevalence of what is referred to as “lifetime” employment, coupled with strict regulations on firing employees (Cabinet Secretariat, 2008). Since it is difficult for Japanese firms to lay off workers, Japanese firms hesitate to restructure costly internal ICT divisions. Because of these constraints, Japanese firms cannot procure business services from the most productive vendors, causing a reduction of the benefit of BPO and keeping the BPO market underdeveloped at the same time.

Another factor which makes ICT inputs expensive for small firms is the difficulties they face in recruiting ICT experts. The supply of ICT software experts in Japan is much smaller than that in the United States (Arora, Branstetter, & Drev, 2013). These factors are likely to make ICT input prices in Japan more expensive for smaller firms. Another problem for small companies is liquidity constraints. Not only purchases of ICT hardware and software, but also many other types of ICT expenditure, such as expenditure for data processing and input, the labor costs of information system divisions, etc. After the two lost decades (Fukao, 2008), most small and/or growing young firms need to finance their investment through banks. Yet, because most Japanese banks still require tangible assets as collateral for lending and venture capital markets are not well developed in Japan. It is difficult for such small/young firms to finance intangible ICT investment. As a result, these smaller firms may be liquidity-constrained when investing in ICT intangibles. Finally, many small firms in Japan simply do not have sufficient knowledge with regard to new ICT and do not realize their potential merits. According to a survey by the Japan Electronics and Information Technology Industries Association (JEITA), many Japanese firm members answered that they had never heard of or did not know much about private clouds, public clouds, the business use of mobile technology, big data and social networks (JEITA, 2013).

### **III. CT & DL IN EDUCATIONAL ENTITIES**

Nearly 75% of people in Japan have access to a computer at home and use the Internet (Suzuki, 2012). However, when it comes to technology integration in the classroom, Japanese schools tend to take more conservative approaches (Salcito, 2010). In Japan, the rate of regular classrooms equipped with computers is 35% (MEXT, 2011). The rate of teachers who use computers and the Internet in classes is about 50%, as is the rate of teachers who have confidence in using computers in classes (Shimizu et al., 2007). The attitude of the teacher towards using technologies in the classrooms is a major factor in the successful technology integration (Tabata & Johnsrud, 2008). They are more engaged in professional development activities and collaboration with colleagues, so a large number of teachers don't use technology very often. There are many factors that attribute the teachers' negative attitudes towards the integration of technology. The experience of technology use affects teachers' anxiety and attitude, the higher the frequency of such experiences is, the more it affects anxiety and attitude (Takayama, 1993). Teachers' fears of being replaced by technology also create negative attitudes (Qing, 2007).

While some teachers believe technology integration in the classroom will enhance their instruction, many consider the training they receive as insufficient, and available technology in schools is limited (Kazu, 2011). The training is often offered at inconvenient times or at other locations on different computers than those used in the classroom (Hixon & Buckenmyer, 2009). Another aspect to consider is that traditionally, Japanese classrooms are teacher-centered and students are expected to be quiet (Takeya, 1992). Morrone (2012) attributes Japan's stagnation in integrating technology to the Japanese university entrance exam that dictates the curriculum in Japanese secondary education. The entrance exam tends to be based on conventional content and methods; consequently, it keeps everything new and innovative like learning with technology off the curriculum. Elementary students in the large cities tend to use computers more often than those living in the rural areas, while this trend is reversed in middle grade and high school levels (Benesse Educational Research and Development Center, 2008). In addition, a study by Joshi and his colleagues (Joshi, Pan, Murakami, & Narayanan, 2010) showed that Japanese kindergarten teachers were more skeptical and unsure of the benefits of computers. They believed that hands-on, sensory experience should be more emphasized in developing young children's performance.

#### **IV. CT & DL IN KANDA INSTITUTE OF FOREIGN LANGUAGES.**

The Kanda Institute of Foreign languages (KIFL) is an educational institution founded in 1957 in Tokyo, Japan (Kanda Institute of Foreign Languages, 2021). It is a vocational institution which focuses mostly on language lessons and practical skills so that students will enter university or be employed after graduating. KIFL has a Digital Strategies Innovation department (DSI) which is headed by Yukimi Imaoka. She has 7 years of experience as an educational content developer focused on the expertise to engage students to learn with digital technology.

Mrs. Imaoka describes DSI's mission as: To utilize advanced technology, including meaningful ICT usages such as AI & VR in language education and the utilization of student tablets or other mobile platforms. From her perspective, today's primary and secondary level students have had smartphones since they were born, so school digital literacy education is substantial. On the other hand, the current university students are often overlooked. That generation has not received much digital literacy education. She notices that the development of digital literacy is lagging due to the delay in the development of information structures compared to other Asian countries. According to her, in 2003, the government established new subjects in high school to foster digital literacy but high schools that focused on university entrance exams were not active in efforts other than the exam subjects. At the same time, securing specialized teachers was also one of the issues. These created a difference in level in each school. Therefore, some of the students have an excellent understanding of how things work with technology, while others have no idea on how to interact with it at the most basic level. She noted that some of the problems that students face at KIFL are serious issues with the use of text messages (SNS). With communication on SNS becoming commonplace, privacy protection and security management have become critical issues. For students, it seems there is a bias between being able to speak freely and being responsible for what they say.

DSI's aim with students is primarily focused on students who have received DL education prior to enrolling in KIFL, but at the same time, DSI has been working to improve teachers' digital literacy first by introducing Google services to faculty and staff and distributing tablets to support classes for several years. She notes that they were aware that the latter would take much more time than educating students. The overall goal of DSI is to teach students how to be autonomous learners. They learn how to learn. "When we talk about digital, it is an ongoing thing and will keep updating; therefore, we all need to keep learning, keep updating ourselves even after graduating from school." She concludes.

#### **V. CONCLUSION**

In conclusion, DL and ICT adoption will remain low in Japan for the foreseeable future until there are reforms in the government's internal structure, the rigidity in labor markets, the high cost and low accessibility of ICT and lack of education from small businesses in conjunction with the skepticism from educational entities in the merits of technological adoption and the pedagogical objectives of primary and secondary education. These factors directly affect the DL and ICT of the country and prevents its citizens from utilizing technology to its full potential. By avoiding these changes, the current Japanese society is putting a heavy burden on upcoming generations who will have a much more difficult challenge trying to educate their society while trying to catch up with other countries which have been adopting technology into their everyday routines and that by then will be well ahead of Japan. Some institutions and programs are focused on the development of ICT and DL across the younger generations, but there is still much work to be done.

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