The Impact of ICT Training on Income Generation Opportunities for Vulnerable Young Adults in Lebanon

Rasha ElSaheli-Elhage[1]
Chantal Lakkis[2]

[1]*Chicago State University, USA*
Email: relhage@csu.edu
[2]*DOT Lebanon Consultant, Lebanon*

Abstract

The aim of this study was to identify if acquiring ICT skills through DOT Lebanon's ICT training program (a local NGO) improved income generation opportunities after 3-months of completing the training. The target population was the NGO's vulnerable young beneficiaries. This study was completed in an effort to find creative and digital solutions to the high rate of youth unemployment in Lebanon (37%), one of the highest rates in the world. Results showed that 48% of beneficiaries who were unemployed at baseline, were exposed to at least one income generation opportunity 3 months after completing the DOT Lebanon training. Also, 49% of beneficiaries who were already employed at baseline were exposed to at least one income generation opportunity. Gender, English proficiency and governorate were variables that were found to be statistically significant. Males were more likely than females to be exposed to income generation opportunities. Those who knew little English had better chances than those who had no English proficiency. Beneficiaries living in the capital Beirut were more likely than others to be exposed to income generation opportunities.

1. Introduction

The spur of ICT (Information and Communication Technologies) innovations in the twenty-first century has massively disrupted economies and business models (Christensen, 2013; Tohmatsu, 2012). Millions of jobs face a high probability of being replaced because computers and the internet are reshaping the labor market (Oliver, 2015). In the framework of globalization, digital skills are now considered preliminary for securing professional employment across the globe (Pirzada & Khan, 2013). Consequently, many employers across a wide range of sectors are increasingly viewing ICT skills as an important component of employability (Belt & Richardson, 2005; Johnson & Burden, 2003). The omnipresence of computing has made digital literacy increasingly critical to success in any occupation (Murray & Pérez, 2014). In fact, organizations are now identifying digital skills or computer literacy as one of their core values for employability (such as the US Department of Education, the US Department of commerce, the OECD Program for the International Assessment of Adult Competencies and the European Commission).

In particular, in developing countries, digital skills are estimated to reduce poverty levels and increase employment rates (Bennett, Maton, & Kervin, 2008). ICT competence can bring significant benefits to marginalized groups, allowing these groups to participate more fully in society as it improves employment opportunities, overcomes isolation, builds confidence and leads to further learning (Bunker, 2010). It's not a surprise that Digital Literacy has been deemed an essential life skill (Europea, 2008). Individuals' digital

engagement has direct implications on their academic performance, labor market success and entrepreneurship uptakes. Those who function better in the digital realm and participate more fully in digitally mediated life enjoy advantages over their digitally disadvantaged counterparts (Robinson et al., 2015). ICT have become central to every economy and to people's quality of life in every society (Olatoye, 2011).

Nevertheless, a new form of inequality is emerging, adding to all the existing forms of discrimination (Hilbert, 2011). Concerns are being raised that the digital divide is leaving behind those most in need of assistance (Greig, 2004). It is feared that as the role of ICT continues to expand, the exclusion experienced by disadvantaged groups may be accentuated and reinforced, rather than mitigated (Corrigan & Joyce, 2000). Discussions about digital divides typically refer to socio-economic disparities in accessibility and usage of ICT. The use of such technologies result in several beneficial outcomes while the non-use of such technologies excludes people from full participation in contemporary society (Helsper, Deursen, & Eynon, 2015). Many studies have established that basic access to digital resources and the skills to effectively use them still escape many economically disadvantaged or traditionally underrepresented portions of the population (Witte & Mannon, 2010). Thus, digital inequalities can reinforce and exacerbate existing social inequalities (DiMaggio & Garip, 2012). Further interventions are needed to ensure that the unqualified, the low skilled, the long-term unemployed and those on low incomes are enabled to reap the benefits of new services and opportunities for job seeking through ICT (Lindsay, 2005).

1.1. English and ICT

Studies continue to show that primary language is among the variables associated with disparities in access to and use of technology (Fox & Livingston, 2007) and that the lack of or low proficiency in English can hinder digital literacy and digital use.

Jarvis and Achilleos (2013) reported that English language acquirers use the Internet a great deal, and much of this use is in English. This is true for both social and informational use of English. 73% of Arabic Speakers who were surveyed agreed with the statement "I use English to communicate online with friends from other countries". Their research confirmed that there is an impressive amount of English use on the internet for a wide range of services even for those with lower English proficiency. Furthermore, the British Council reports that over 2/3 of the world's scientists read in English, 3/4 of the world's mail is written in English, 80% of the world's electronically stored information is in English and, of the estimated 200 million users of the Internet, some 36% communicate in English (Gunderson, Odo, & D'Silva, 2011). English can be seen as the leading language in the digital realm (Kornai, 2013). According to Ghasemi and Hashemi (2011) ICT helps English language learners in a number of areas including communication, cognitive skills, creativity and independence. Consequently, it could be determined that low proficiency in English could play a negative role in acquiring digital skills, understanding information via internet and accessing job opportunities. UNDP's latest labor needs assessment for Lebanon (UNDP, 2016) found that within the ICT sector, weak language and communication skills (in English) serve as a barrier to learning, research and development. One of its recommendations was to invest in language (English) training schemes especially that over 43% of professionals working in the ICT sector were found to have significant weaknesses in "communicating in spoken and written English well enough to be understood by others" (UNDP, 2016).

1.2. Lebanon

Lebanon is a small country situated in the Middle East on the Eastern shores of the Mediterranean Sea. Its official language is Arabic. In the 1970s, various tensions inherent to the Lebanese system and multiple regional developments contributed to the breakdown of governmental authority and the outbreak of civil war in 1975 (Khalidi, 1979; Salibi, 1976) which ended with the Taif agreement in 1990. Even after the signature of this peace agreement which ended a 15-year civil war, Lebanon remains a troubled country (Ghosn & Khoury, 2011) due to internal and regional instabilities. In 2011, the eruption of the Syrian crisis had a devastating impact on Lebanon. The sudden influx of refugees highlighted existing economic and social troubles and made Lebanon the country with the most refugees per capita in the world (UNHCR, 2016). Following decades of conflict and ongoing political turmoil, the additional pressure on Lebanon's weak infrastructure, fragile political and religious composition, and unfavorable economic and employment conditions have shown to be destabilizing. At a national poverty rate of 27.4 (World Bank, 2019) and 37% youth unemployment rate (Brihi, Takieddine, & Zmeter, 2019) Lebanon is already among the countries with the highest youth unemployment in the world (World Bank, 2019). The sharp upsurge in the number of individuals seeking low wage jobs has not only increased economic competition but also deepened the tension between the Syrian population and host communities. Unskilled youth struggle to find employment in the crowded labor market (Lebanon Crisis Response Plan (LCRP), 2019).

1.3. Gender Inequality in Lebanon

Lebanese women are in a constant battle with a male-dominated culture and many are not able to escape a poor quality of life due to their vulnerable economic position. With an overall 25% unemployment rate nationwide (Brihi et al., 2019) women specifically are not being successful in finding suitable, relevant,

equitable, and flexible jobs, and many have not been trained for a career and equipped with the basic ICT and 21st century skills.

Within 142 surveyed nations, Lebanon ranks 135th on the Gender Gap Index, which makes it the eighth worst country for gender equality. According to UNICEF (2011) Lebanese women aged between 15 and 24 record a low economic participation with a labor force participation rate equal to 22%, while the corresponding percentage for young men is almost double with a rate of 42%. The Central Administration of Statistics in Lebanon reported that 77.2% of Lebanese women of working age are not economically active (unemployed and not looking for a job) compared to 27.2% for men. Globally, the labor force participation rate of women is 52%, indicating an urgent need to intervene and increase women's economic participation in income generating activities within the Lebanese Society.

1.4. Lebanon's ICT Sector

While a number of Arab governments have adopted digital literacy programs such as Egypt, Jordan, the UAE, Kuwait, Saudi Arabia and Oman (Bunker, 2010) Lebanon has yet to overcome public negligence and corruption in the ICT sector, hindering its growth far more than expected (Chami & Mikhael, 2016). The low quality and poor coverage of infrastructure coupled with high costs have created limitations for the exponential advancement of Lebanon's ICT market (Soueid, Ghanem, & Nehme, 2015). Furthermore, the low quality of vocational ICT trainings discourages firms from hiring young fresh graduates (UNDP, 2016). According to a study completed by UNDP (2016) 96% of semi-skilled workers in the Agro-food industry suffer from basic ICT skills weaknesses, 89.6% in the construction industry and 26.2% of professional staff in the ICT industry show weaknesses in selecting and using tools & technology. These high percentages confirm the need for interventions to improve ICT skills across a variety of sectors in Lebanon, especially that it has been established by now that initiatives aiming at increasing digital literacy in developing countries have the capacity to produce economic, health, and quality of life benefits (Venkatesh & Sykes, 2013).

1.5. DOT Lebanon ICT Training Program

DOT Lebanon is a registered local Lebanese NGO reporting to a local Lebanese board and also reporting to its affiliate organization DOT Canada based in Ontario. DOT Lebanon supports vulnerable youth and women to lead change in the communities they serve, transforming them into daring social innovators who have the tools, knowledge, and networks to create opportunities. Its model is based on a movement: encouraging a youth-led, grassroots approach to social innovation and community transformation, and ushering in a new era of sustainability, scale, and transformative change. DOT Lebanon's vision intends to support youth and women to become social innovators and leaders, and to create and apply digital solutions that have a positive impact in their communities. The core expertise of DOT Lebanon has been working with youth and women nationwide for more than 10 years, providing them with digital and entrepreneurial skills to help them improve the quality of their lives.

The subject of this study was one of DOT Lebanon's programs: Digital Media Literacy Program (DML), a 2-level digital youth training program delivered in 14 different centers across Lebanon. The program was developed with the aim of providing under-privileged youth with digital skills to increase their access to income generating opportunities. The program is offered to all applicants regardless of their nationality or status (nationals, refugees, migrants, no legal status, etc.).

The skills targeted by DOT Lebanon's ICT training are based around those skills that an individual would need to use ICT effectively and complete the tasks they wish to undertake. These would include:

- Basic skills for personal and business communications (e-mail and internet usage).
- Skills related to using the computer (logging on, locating files, opening applications and uploading and saving files).
- Skills related to using basic word processing, spreadsheet and other common applications.
- Advanced skills within applications (which may allow the user to undertake more complex tasks).
- Knowledge around how computers and the internet operate, which is critical to allow the individual to be able to use the technology in a confident and secure manner.

The aim of this study was to identify if acquiring ICT skills through DOT Lebanon's ICT training program improved income generation opportunities after 3-months, for DOT Lebanon's beneficiaries enrolled in the training from February 2018 till September 2018.

2. Methodology

2.1. Study Design

This is a prospective cohort study describing being exposed to at least 1 income generation opportunity after 3-months from completion of DOT Lebanon's ICT training. Income generation opportunity is defined as:

- Being called for an interview (online, in person or through a recruiter), or
- Completing an internship, or
- Creating/using a technology platform to generate income (website, mobile app, blog, software, Social Media).

Participants chosen for this study were above 18 years old (labor law in Lebanon sets the eligibility age for work at 18 years) who have completed DOT Lebanon ICT training.

2.2. Study Procedure

Upon registering in the training, participants filled the DOT Lebanon registration form that included basic demographic information (gender, age category, nationality, address and educational level). Participants were informed that a follow-up text message (sms) and email including a link for the questionnaire, with reminders sent weekly for 4 weeks, will be sent at 3-months from completion of the course. Oral consent was obtained from participants. All participants who completed their course by September 2018 were contacted.

2.3. Data Analysis and Statistics

Data was analyzed using Statistical Package for the Social Sciences (SPSS)© version 20. Demographic and cohort characteristics were reported and then analyzed at bivariate level with the main outcome. In addition, logistic regression analysis for covariates that exhibited a p-value<0.2 with the main outcome were tested to explore the variables that impacted the outcome in an overall model. Levels of significance were set at p <0.05.

2.4. Limitations

A limitation that arises with a longitudinal study is the loss of participants over time. The total sample of respondents was satisfactory but not optimal even though regular reminders were sent. The logistical and financial needs to track individuals over time was costly and time consuming. Thus the generalizability of this study could be hindered. However, the short period of recall of only 3-months would have reduced the effect of recall bias.

3. Results

The response rate for this follow-up study was 43.2%. At the 3-month mark, questionnaires were sent out to 637 beneficiaries who had successfully completed the DOT Lebanon training. 275 complete responses were received. The researchers consider the above response rate adequate, especially that studies conducted in Lebanon using similar methods of surveys yield a wide range of response rates varying from 17% to 56.3 % (Aboujaoude, Nona, Koran, & Large, 2006; Awada, Diab, & Faour, 2018; UNDP, 2018).

Most of the participants were females (56%) with almost half in the younger age group (18 to 20). Around 70% were from Lebanese nationality, reflecting the distribution of DOT Lebanon training participants. As for area of living of the participants, it was distributed across all governorates. Half of the respondents went to university, however, more than two-thirds were not employed. Out of total respondents, 66% had attended trainings other than DOT Lebanon training.

As for knowledge of the English language, more than 90% said they had a little or good knowledge of reading English, more than 80% stated the same for reading and writing English, and most (around 80%) had access to a laptop.

For the main outcome, being exposed to at least one income generation opportunity, the answers were divided almost in half Table 1.

At the bivariate level Table 2, gender, age, governorate, undergoing other trainings, level of speaking and writing English showed a statistical significance difference between those who were exposed to at least one income generation opportunity with p-values of .008, .009, <.001. <.001, .010 and .046 respectively. Males and older age group proved to be more exposed than the other groups. Akkar, Beirut, Bekaa and the North of Lebanon were the regions that showed that the DOT Lebanon trainees were more prone to find income generation opportunities. Half of participants who were unemployed at registration were exposed to at least one income generation at baseline; however, unemployment status was not significant with the outcome (p-value = .489). Moreover, when pooling all variables with p-values <0.2 in a logistic regression model Table 3 only gender, governorate and reading in English were the variables that showed statistical impact on the main outcome. Males were 0.4 times more likely to get exposed to an income generation opportunity, while participants who knew how to read English a little were 22.1 times more likely than those who did not know at all. Beneficiaries living in the capital Beirut were more likely to be exposed to income generation opportunities than those living in other governorates.

Table-1. Characteristics of participants in the 3-months survey after completion of ICT training for DOT beneficiaries, to identify income generation opportunities.

Characteristics of Participants		Survey at 3-months N (%)
Gender	Female	153 (56)
	Male	122 (44)
Age group	18-20	132 (48)
	21-24	102 (37)
	25+	41 (15)
Nationality	Lebanese	193 (70)
	Syrian	53 (19)
	Palestinian	27 (10)
	Other	2 (<1)
Governorate	Akkar	21 (8)
	Baalbaak	8 (3)
	Beirut	12 (4)
	Bekaa	55 (20)
	Mount Lebanon	38 (14)
	Nabatieh	36 (13)
	North	57 (21)
	South	48 (17)
Educational level	Intermediate	27 (10)
	University	132 (48)
	Secondary	66 (24)
	Technical/Vocational	43 (16)
	Elementary	7 (2)
Employment status at registration	No	195 (72)
	Yes	80 (28)
Underwent other trainings	No	92 (34)
	Yes	183 (66)
Level of reading of the English language	I do not know at all	16 (6)
	I know a little	112 (42)
	I know very well	141 (52)
Level of speaking of the English language	I do not know at all	41 (15)
	I know a little	143 (53)
	I know very well	85 (31)
Level of writing of the English language	I do not know at all	45 (17)
	I know a little	137 (51)
	I know very well	87 (32)
Access to laptop	No	59 (22)
	Yes	210 (78)
Income generation opportunity at time of survey	No	143 (52)
	Yes	132 (48)

Source: DOT Lebanon.

4. Discussion

4.1. Income Generation Opportunity Status

The results showed that 195 (72%) beneficiaries were not employed at baseline. 93 of them (48%) were exposed to at least one income generation opportunity 3 months after completing the DOT Lebanon training. Additionally, out of the 80 (28%) beneficiaries who were employed at baseline, 39 of them (49%) were exposed to at least one income generation opportunity 3 months after completing the DOT Lebanon training. When evaluating the data qualitatively, the results indicate a positive impact on beneficiaries who attended the DOT Lebanon ICT training. Even though the results were not statistically significant due to the current economic crisis the country is subject to, from a humanitarian perspective, helping almost 48% of the beneficiaries and subsequently their families secure at least one income generation opportunity in a country with one of the highest youth unemployment rates is a victory. The 2018 United Nation's annual report on Lebanon described the country's medium-term economic prospects as bleak, which is likely to adversely impact vulnerability and poverty rates (UN Lebanon Annual Report, 2018). Providing ICT basic training, which has proven to increase the chances of being exposed to income generation opportunities is one way of alleviating the heavy weight of unemployment.

Table-2. Bivariate analysis for characteristics of beneficiaries from DOT Lebanon ICT training for being exposed to at least one income generation opportunity after 3-months from completion of training.

Income generation opportunity N (%)		Survey at 3-months		
		No	**Yes**	**p-value**
Gender	Female	90 (59)	63 (41)	.008*
	Male	53 (43)	69 (57)	
Age group	18-20	81 (61)	51 (39)	.009*
	21-24	46 (45)	56 (55)	
	25+	16 (39)	25 (61)	
Nationality	Lebanese	102 (53)	91 (47)	.858
	Syrian	25 (47)	28 (53)	
	Palestinian	15 (56)	12 (44)	
	Other	1 (50)	1 (50)	
Governorate	Akkar	9 (43)	12 (57)	<.001*
	Baalbaak	4 (50)	4 (50)	
	Beirut	4 (33)	8 (67)	
	Bekaa	20 (36)	35 (64)	
	Mount Lebanon	31 (82)	7 (18)	
	Nabatieh	21 (58)	15 (42)	
	North	21 (37)	36 (63)	
	South	33 (69)	15 (31)	
Educational level	Elementary	4 (57)	3 (43)	.087
	Intermediate	13 (48)	14 (52)	
	Secondary	44 (67)	22 (33)	
	Technical/Vocational	19 (44)	24 (56)	
	University	63 (48)	69 (52)	
Employment status at registration	Yes	41 (51)	39 (49)	.489
	No	102 (52)	93 (48)	
Underwent other trainings	No	68 (74)	24 (26)	<.001*
	Yes	75 (41)	108 (59)	
Level of reading of the English language	I do not know at all	14 (64)	8 (36)	.113
	I know a little	64 (57)	48 (43)	
	I know very well	65 (46)	76 (54)	
Level of speaking of the English language	I do not know at all	32 (63)	19 (37)	.010*
	I know a little	77 (56)	60 (44)	
	I know very well	34 (39)	53 (61)	
Level of writing of the English language	I do not know at all	31 (66)	16 (34)	.046*
	I know a little	75 (52)	68 (48)	
	I know very well	37 (43)	48 (57)	
Access to laptop	No	38 (59)	27 (41)	.147
	Yes	105 (50)	105 (50)	

Source: DOT Lebanon.

Furthermore, when examining the quality of public vocational training offered to vulnerable youth in Lebanon, it seems that they receive very limited and outdated competencies and practical experience (Kawar & Tzannatos, 2013). Fresh graduates are facing digital skills gap in the workplace (Wehbe, 2016). The increase in the number of youth who were exposed to at least one income generation opportunity 3 months after completing the DOT Lebanon training could be an indication that the newly acquired ICT skills are making vulnerable youth more employable. By closing information gaps and offering an interactive and practical ICT training, DOT Lebanon's training seems to enhance youth's ability to participate in the economic community. In fact, statistics from previous DOT Lebanon projects reports indicate that 37% of beneficiaries who had previously completed their ICT training increased their household income and 65% increased involvement with their communities.

Table-3. Multiple regression for potential factors determining the exposure to at least one income generation opportunity of beneficiaries of DOT Lebanon ICT training after 3-months from completion.

		Exposed to at least one income generation opportunity N(%)		Odds ratio	*p*-value
		No	Yes		
Gender	Female	90 (59)	63 (41)		
	Male	53 (43)	69 (57)	.40	.038*
Age group	18-20	81 (61)	51 (39)		.331
	21-24	46 (45)	56 (55)	1.00	.988
	25+	16 (39)	25 (61)	2.88	.158
Governorate	Akkar	9 (43)	12 (57)		.063
	Baalbaak	4 (50)	4 (50)	.55	.736
	Beirut	4 (33)	8 (67)	.07	.025*
	Bekaa	20 (36)	35 (64)	.75	.777
	Mount Lebanon	31 (82)	7 (18)	.38	.363
	Nabatieh	21 (58)	15 (42)	.32	.294
	North	21 (37)	36 (63)	1.25	.839
	South	33 (69)	15 (31)	.19	.113
Educational level	Elementary	4 (57)	3 (43)		.230
	Intermediate	13 (48)	14 (52)	5.19	.372
	Secondary	44 (67)	22 (33)	.60	.728
	Technical/Vocational	19 (44)	24 (56)	1.84	.689
	University	63 (48)	69 (52)	1.29	.864
Underwent other trainings	No	68 (74)	24 (26)		
	Yes	75 (41)	108 (59)	.43	.072
Level of reading of the English language	I do not know at all	14 (64)	8 (36)		.010*
	I know a little	64 (57)	48 (43)	22.10	.007*
	I know very well	65 (46)	76 (54)	6.53	.117
Level of speaking of the English language	I do not know at all	32 (63)	19 (37)		.571
	I know a little	77 (56)	60 (44)	.26	.291
	I know very well	34 (39)	53 (61)	.27	.362
Level of writing of the English language	I do not know at all	31 (66)	16 (34)		.578
	I know a little	75 (52)	68 (48)	2.58	.441
	I know very well	37 (43)	48 (57)	1.64	.717
Access to laptop	No	38 (59)	27 (41)		
	Yes	105 (50)	105 (50)	.67	.607

Source: DOT Lebanon.

4.2. Gender Inequality

Gender was found to be a statistically significant variable and its significance was highlighted in the overall model. The results indicate a statistical difference between males and females in their exposure to income generation opportunities after completing the DOT Lebanon ICT training. Males had better chances of being exposed to at least one income generation opportunity than females. The results are in line with Lebanon's male-dominated culture where women, especially those from vulnerable backgrounds, still struggle to find a suitable job. Nevertheless, efforts for training vulnerable women on ICT skills should be intensified especially that traditional axes of inequality such as gender have direct impact on widening the gender digital divide.

4.3. English Reading Proficiency

The results indicate a significant difference in the level of reading the English language. It appears that after completing the DOT Lebanon ICT training, beneficiaries who knew a little English were 22 times more likely to be exposed to at least one income generation opportunity in comparison to those who didn't read English at all, even when all other variables are pooled in the model. In fact, studies continue to show that primary language is among the variables associated with disparities in access to and use of technology (Fox & Livingston, 2007) and that the lack of or low proficiency in English can hinder digital literacy and digital use. These results have important implications related to improving the content of the training to intentionally

include English terminology or even better, offer basic English language trainings as another training component of the DOT Lebanon ICT program.

4.4. Governorate Disparities

Beneficiaries living in the capital Beirut were more likely to be exposed to at least one income generation opportunity in comparison to those living in other governorates: Akkar, North, Baalback, Bekaa, Nabatieh, South and Mount Lebanon, even after adding all relevant variables in the regression model. Even though the capital Beirut is not the only big and busy city in Lebanon, it is still considered the biggest hub for employment and job opportunities for the country. These results were expected as the country's struggle toward "decentralization" hinders an even development and prevents a balanced job market between the different regions of Lebanon (Democracy Reporting International (DRI), 2017; Harb & Atallah, 2015). Consequently, ICT training should continue in all areas especially outside Beirut, creating more competitive beneficiaries with ICT skills. The aim of DOT Lebanon ICT training program is not only to instill ICT skills among its beneficiaries, but to also address the shortage of job opportunities outside the capital by creating young workers who can work remotely at a much cheaper cost. All that is needed is an internet connection and access to a laptop which, according to the results in this study, is not a hindering factor.

5. Conclusion

Lebanon is already among the countries with the highest youth unemployment rate in the world (Brihi et al., 2019) (World Bank, 2019). The sharp upsurge in the number of individuals seeking low wage jobs (due to the Syrian refugee crisis) has increased economic competition and unskilled youth are struggling to find employment in the crowded labor market. But since nowadays digital technologies underpin effective participation in key areas of life and work (International Telecommunication Union (ITU), 2017) and are used in all types of jobs, even the ones not traditionally related to digitization e.g. farming and construction (European Commision, 2017) one way of fighting the risk of youth living in Lebanon of becoming a lost generation, is training them on ICT skills. Current dialogues on development persistently identify ICT as a requirement for economic growth and the improvement of social conditions. Technological innovation enhances human capabilities and impacts economic growth through productivity gains (Avgerou, 2003).

This research study comes to validate and quantify a number of assumptions in the Lebanese context. First, training the vulnerable youth on ICT skills can warrant an increase in exposure to income generating opportunities. Second, targeting women with ICT training is of utmost importance to reduce the gender digital divide which has already gained a foothold in the Lebanese society. Indeed, men are more likely than women to be exposed to income generating opportunities even though they were subject to the same ICT training. Third, combined with ICT skills, English proficiency is an advantage that can increase one's chances of acquiring income generation opportunities. Finally, there is a brewing need to create remote workers who are ICT literate and who can fulfill jobs online and from a distance, without the financial burden required when traveling to the capital Beirut.

References

Aboujaoude, E., Nona, G., Koran, L. M., & Large, M. D. (2006). Potential markers for problematic internet use: A telephone survey of 2,513 adults. *CNS Spectrums, 11*, 750-755. Available at: 10.1017/S1092852900014875.

Avgerou, C. (2003). The link between ICT and economic growth in the discourse of development. In organizational information systems in the context of globalization (pp. 373-386). US: Springer.

Awada, G., Diab, H., & Faour, K. (2018). A call for curriculum reform to combat refugees crisis: The case of Lebanon. *The Curriculum Journal, 29*(1), 43-59.

Belt, V., & Richardson, R. (2005). Social labour, employability and social exclusion: Pre-employment training for call centre work. *Urban Studies, 42*(2), 257–270.

Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Educational Technology, 39*(5), 775-786.

Brihi, J., Takieddine, A., & Zmeter, M. (2019). *Unemployment in Lebanon findings and recommendations*: Ministry of Labor.

Bunker, B. (2010). *A summary of international reports, research and case studies of digital literacy*. Wellington: New Zealand Computer Society Inc.

Chami, M., & Mikhael, M. (2016). Lebanon's ICT sector: Great potential inhibited by government control (pp. 1-3). Beirut: Blom Invest Bank.

Christensen, C. M. (2013). *The innovator's dilemma: When new technologies cause great firms to fail*: Harvard Business Review Press.

Corrigan, P., & Joyce, P. (2000). Reconnecting to the public. *Urban Studies, 37*(10), 1771-1779.

Democracy Reporting International (DRI). (2017). Reforming decentralization in Lebanon: The state of play. *Democracy Reporting International Briefing Paper*.

DiMaggio, P., & Garip, F. (2012). Network effects and social inequality. *Annual Review of Sociology, 38*, 93-118.

Europea, C. (2008). *Digital literacy European commission working paper and recommendations from digital literacy high-level expert group*. Paper presented at the E-Inclusion Ministerial Conference & Expo.

European Commision. (2017). ICT for work: Digital skills in the workplace" on the impact of information and communication technologies (ICT) on the transformation of jobs and skills. Final Report.

Fox, S., & Livingston, G. (2007). Latinos online. Pew internet and American life project. Retrieved from http://www.pewinternet.org/pdfs/Latinos_Online_March_14_2007.pdf.

Ghasemi, B., & Hashemi, M. (2011). ICT: Newwave in English language learning/teaching. *Procedia Social and Behavioral Sciences, 15*, 3098-3102. Available at: https://doi.org/10.1016/j.sbspro.2011.04.252.

Ghosn, F., & Khoury, A. (2011). Lebanon after the civil war: Peace or the illusion of peace? *The Middle East Journal, 65*(3), 381-397.

Greig, M. (2004). Ronald W. McQuaid, Colin Lindsay. *Information, Communication & Society, 7*(3), 364-388.

Gunderson, L., Odo, D. M., & D'Silva, R. (2011). Second language literacy. *Handbook of Research in Second Language Teaching and Learning, 2*, 472-487.

Harb, M., & Atallah, S. (2015). Lebanon: A fragmented and incomplete decentralization. *Local Governments and Public Goods: Assessing Decentralization in the Arab World*, 187.

Helsper, E. J., Deursen, V. A. J., & Eynon, R. (2015). Tangible outcomes of internet use: From digital skills to tangible outcomes project report.

Hilbert, M. (2011). Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. *In Women's Studies International Forum. Pergamon, 34*(6), 479-489.

International Telecommunication Union (ITU). (2017). World telecommunication development conference. Final Report. Buenos Aires, Argentina. October 9-20, 2017.

Jarvis, H., & Achilleos, M. (2013). From computer assisted language learning (CALL) to mobile assisted language use (MALU). *Tesl-ej, 16*(4), n4.

Johnson, S., & Burden, T. (2003). *Young people, employability and the induction process.* York: Joseph Rowntree Foundation.

Kawar, M., & Tzannatos, Z. (2013). Youth employment in Lebanon: Skilled and jobless. *LCPS Policy Paper.*

Khalidi, W. (1979). *Conflict and violence in Lebanon: Confrontation in the Middle East* (Vol. 38): Center for International Affairs, Harvard University.

Kornai, A. (2013). Digital language death. *PloS One, 8*(10), e77056.

Lebanon Crisis Response Plan (LCRP). (2019). Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/67780.pdf.

Lindsay, C. (2005). Employability, services for unemployed job seekers and the digital divide. *Urban Studies, 42*(2), 325-339.

Murray, M. C., & Pérez, J. (2014). Unraveling the digital literacy paradox: How higher education fails at the fourth literacy. *Issues in Informing Science and Information Technology, 11*, 85.

Olatoye, R. (2011). Levels of participation in ICT training programmes, computer anxiety and ICT utilization among selected professionals. *International Journal of Education and Development Using ICT, 7*(2), 15-26.

Oliver, B. (2015). Redefining graduate employability and work-integrated learning: Proposals for effective higher education in disrupted economies. *Journal of Teaching and Learning for Graduate Employability, 6*(1), 56-65.

Pirzada, K., & Khan, F. (2013). Measuring relationship between digital skills and employability. *European Journal of Business and Management, 5*(24).

Robinson, L., Cotten, S. R., Ono, H., Quan-Haase, A., Mesch, G., Chen, W., & Stern, M. J. (2015). Digital inequalities and why they matter. *Information, Communication & Society, 18*(5), 569-582.

Salibi, K. S. (1976). *Crossroads to civil war: Lebanon 1958-1976*: Ithaca Press.

Soueid, M., Ghanem, S., & Nehme, R. (2015). Analysis of Lebanon's ICT sector (pp., Rep.) (pp. 1-18). Beirut: Bankmed.

Tohmatsu, D. T. (2012). Digital disruption: Short fuse big bang? *Building the Lucky Country.*

UN Lebanon Annual Report. (2018). Working together for a secure, stable and prosperous Lebanon.

UNDP. (2016). Mind the gap: A labour needs assessment for Lebanon.

UNDP. (2018). Whatsapp surveying guide: Lessons learnt from two qualitative Whatsapp surveys in Lebanon.

UNHCR, T. (2016). *Global trends: Forced displacement in 2015*. Geneva: UNHCR.

UNICEF. (2011). MENA gender equality profile.

Venkatesh, V., & Sykes, T. A. (2013). Digital divide initiative success in developing countries: A longitudinal field study in a village in India. *Information Systems Research, 24*(2), 239-260.

Wehbe, S. (2016). Fresh graduates in Lebanon face digital skills gap in the workplace. Retrieced from https://medium.com/@shadawehbe/fresh-graduates-in-lebanon-face-digital-skills-gap-in-the-worplace-1fb5ed0702ac. [Accessed, August 5, 2019].

Witte, J. C., & Mannon, S. E. (2010). *The internet and social inequalities*: Routledge.

World Bank. (2019). Poverty & equity and macroeconomics. *Trade & Investment Global Practices.*