

ROLE OF ICT EDUCATION IN ICT ENTREPRENEURSHIP DEVELOPMENT IN NEPAL



NEPAL ADMINISTRATIVE STAFF COLLEGE

ROLE OF ICT EDUCATION IN ICT ENTREPRENEURSHIP DEVELOPMENT IN NEPAL



NEPAL ADMINISTRATIVE STAFF COLLEGE

Research Team

Shital Moktan Tamang

Sushil Thapa

© 2020 Research and Consulting Services Department, Nepal Administrative Staff College
www.nasc.org.np

Disclaimer

This work is a product of the staff of Nepal Administrative Staff College (NASC). The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of this institution. NASC does not guarantee the accuracy of the data included in this work.

Recommended Citation

Moktan, S., & Thapa, S. (2020). Role of ICT education in ICT entrepreneurship development in Nepal. Lalitpur, Nepal: Nepal Administrative Staff College.

Corresponding Author:

Shital Moktan Tamang: shital.moktan@nasc.org.np

Acknowledgment

The research has been conducted to analyze the Role of ICT education in ICT entrepreneurship development in the context of Nepal. The paper tries to understand whether ICT entrepreneurs joined the sector after academic degree or training in ICT or not. Convenience sampling and purposive sampling techniques were used for this mixed research to select ICT entrepreneurs to understand their reasons for motivation to join the business and analyze whether there is any role of ICT education in ICT entrepreneurship development in Nepal.

We are humbled by the contributions from various experts and relevant resources, thus we would like to heartily extend our special regards to all the contributory factors without whom this research would not have completed. We would like to extend our gratitude to Dr. Maki Ito Tsumagari, who has guided us throughout the tenure.

We are also very grateful to the officials from Research and Consulting Department of NASC. We would also like to acknowledge the support and contributions of Mr. Trilochan Pokharel for providing his critical suggestions and guidance for shaping our research. We are especially grateful to Mr. Narayan Gopal Malego, Deputy Executive Director for his utter support in this endeavor of ours. We are also very appreciative of the experts and officials of NASC for sharing their views and opinions on the topic which was a guiding factor for us to dig deeper while conducting the research.

We have put in our best efforts to include necessary, relevant and significant information in our report to meet the specified objectives of our research. We have consulted various resources and have worked closely with our guiding superiors to include valid information and minimize errors.

Abstract

ICT entrepreneurs develop products and services such as software, hardware, networking or online businesses using ICT technologies. With the internet and cloud computing technologies, ICT entrepreneurs are crossing borders to cater to their clientele with businesses like Pinterest, Google, Microsoft, Apple, etc. ICT businesses such as Hamro Bazaar, Daraz, Foodmandu, eSewa etc. are popular in Nepal. However, it is unknown whether the ICT entrepreneurs are influenced to start up their business because they have some training or educational degree in the field of ICT or because the market has driven them despite their area of study. Thus, this paper analyzes the role of ICT education in ICT entrepreneurship development in Nepal.

The study follows a mixed research approach. A semi-structured self-completion questionnaire was administered using a convenience sampling method to 50 ICT entrepreneurs of Nepal. Purposive sampling technique was used to select five ICT entrepreneurs for face-to-face interviews and two ICT entrepreneurs for a telephone interview. Secondary sources of data were also referred to.

The study reveals that ICT entrepreneurs have an academic degree or specialized training in ICT. Most ICT entrepreneurs have started their business while studying by exploring the business and applying learnings practically. The courses are seen as a catalyst for influencing or motivating factors for start-up of ICT businesses. However, they perceive that having only academic degree in ICT is not sufficient. Specialized training is preferred for starting up a successful ICT business.

ICT entrepreneurs do not perceive the ICT policies and physical infrastructure environment to be as conducive. However, they recognize that the government is gradually improving the scenario which will help increase the market demand for ICT entrepreneurs. ICT businesses hire for core and supportive functions of business which generates employment opportunities for scholars of different areas. The study reveals that in future, the ICT entrepreneurs may come from any stream, if they have the required competency and passion to drive their business forward.

TABLE OF CONTENTS

Acknowledgment	iii
Abstract	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	vii
1. INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	1
1.3 Objective of the Study	2
1.4 Significance of the Study	2
1.5 Limitations of the Study	2
2. LITERATURE REVIEW	3
2.1 Overview of ICT Education	3
2.2 Overview of ICT Entrepreneurship	4
2.3 Background of Nepal	4
2.4 ICT Education in Nepal	4
2.5 ICT Entrepreneurship in Nepal	5
2.6 IT policies, rules, regulation and plans in Nepal	6
3. RESEARCH DESIGN	8
3.1 Study Design	8
3.2 Sources and types of data	8
3.3 Sampling Design and Target Population	8
4 . DATA PRESENTATION AND ANALYSIS	10
4.1 Descriptive Analysis	10
4.2 Findings of Interview	17
4.3 Analysis and Interpretation	20
5. CONCLUSION AND RECOMMENDATION	21
5.1 Conclusion	21
5.2 Recommendation	22
6. REFERENCES	23
7. ANNEX	25
7.1 Self-Completion Questionnaire Survey	25
7.2 Interview Questionnaire	31

LIST OF FIGURES

Figure 1	10
Age Group of Respondents (in Percentage)	
Figure 2	10
Number of years of service since establishment of ICT business (in Frequency)	
Figure 3	11
Education level of Respondents (in Percentage)	
Figure 4	11
Respondents with specialized ICT training (in Percentage)	
Figure 5	12
Ranking of Motivation to join ICT sector (in Frequency)	
Figure 6	13
Influence to start-up the ICT business (in Frequency)	
Figure 7	13
ICT education motivates ICT graduates to use ICT in their business (in Percentage)	
Figure 8	14
ICT courses provided by universities and colleges in Nepal is sufficient for ICT entrepreneurs (in Percentage)	
Figure 9	14
The policies related to ICT in Nepal is enough to handle ICT business related issue (in Percentage)	
Figure 10	14
The current ICT infrastructure of Nepal supports ICT business (in Percentage)	
Figure 11	15
Respondent's opinion about Government supporting ICT business startups in Nepal (in Frequency)	
Figure 12	16
Opinion on new areas to be covered through ICT entrepreneurship (in Percentage)	
Figure 13	16
Opinion on ICT scholars grabbing the market as ICT entrepreneurs in future (in Percentage)	

LIST OF ABBREVIATIONS

BBA	Bachelor in Business Administration
BBS	Bachelor in Business Studies
BIM	Bachelor in Information Management
CA	Chartered Accountant
CTO	Chief Technical Officer
DC	Data Center
DR	Disaster Recovery
eGMP	E-Government Master Plan
ETA	Electronic Transaction Act
FDI	Foreign Direct Investment
GoN	Government of Nepal
HR	Human Resource
ICT	Information Communication and Technology
IDI	ICT Development Index
IT	Information Technology
MBA	Masters in Business Administration

1. INTRODUCTION

1.1 Background

ICT entrepreneurship is a blend of Tech Entrepreneurship, Online Entrepreneurship and ICT Consultants catering ICT related services or products and services to clients using the internet, computing or mobile technologies. The evidence of ICT entrepreneurship development can be seen through the examples of successful entrepreneurs like Google, Yahoo, Amazon, eBay, Youtube, Facebook etc. In this paper, ICT entrepreneurship is defined as any ICT related business or start-ups that cater ICT services to other businesses or customers. ICT entrepreneurship does not address those companies that have added ICT in their existing business process.

Nepal has the potential for ICT growth through ICT entrepreneurship for overall economic development. According to the NTA, there was an addition of 2.25 million new Internet users in 2017, translating into approximately 250 new Internet users every hour (Neupane, 2018). The ICT Policy 2072 of Nepal also supports and regulates the use of ICT in businesses. This has led to the need for competent and skilled ICT workforce. Thus, the universities, colleges and institutes in Nepal provide ICT related courses and training to produce promising skillful ICT workforce who can adapt,

update and upgrade themselves to the latest forms of technology.

Basobas Nepal, Mero Job, NepFlights, Sarathi Cab, Cloudfactory, Foodmandu, iPay, Urban Girl, etc. are some examples of successful ICT entrepreneurs in Nepal. There are also lots of freelancing companies providing software development, web designing and other ICT related services. These companies support in generating employment and revenue for the country.

Previous studies have tried to analyze the ICT business environment in Nepal, but it does not reveal whether there is any role of ICT education in developing ICT entrepreneurs. Thus, this research aimed to understand whether there is a relation between ICT education and ICT entrepreneurship development in Nepal.

1.2 Problem Statement

ICT companies have been changing the ways of doing business by implementing technologies. However 'the main barriers to digital entrepreneurship appear to include: skills, infrastructure, and various aspects of the business environment' (Welsun, 2016). In Nepal, many people have understood the opportunities presented by ICT market, but it is yet to be known

whether the courses offered are perceived to match with the demand of the market to start-up successful ICT business. Thus, the specific issues the researcher tries to address are:

- Relation between scholars receiving ICT education/training and development of ICT entrepreneurs in Nepal.
- The current scenario of policy environment, physical infrastructure and soft infrastructure for doing ICT business in Nepal.
- The gap between Government support towards ICT businesses and expectation of ICT entrepreneurs.

1.3 Objective of the Study

The purpose of the study is to analyze the Role of ICT education in ICT entrepreneurship development in the context of Nepal.

1.4 Significance of the Study

Many researches point the importance of the skills issues in ICT entrepreneurship and share about the need for the entrepreneurs to possess a degree of technological awareness that allows them to identify new technologies that will transform and shape their business model that will allow them to do new things or do things differently, develop new products and services, understand ways of delivering

and communicating with suppliers, customers and employees. But, it is unclear whether the ICT courses offered in Nepal are sufficient for the start-up of ICT based business and whether the existing physical infrastructure and policy support it. So, it is significant to recognize whether there is a relation between ICT scholars and development of ICT entrepreneurship. Thus this research would provide a basic roadmap to the government, universities/institutions responsible to produce efficient and skilled ICT workforce.

1.5 Limitations of the Study

The study is based on primary data collected using semi structured questionnaire and interview methods, but the respondents might be hesitant to give authentic and required information clearly as much as they are expected to. The non-participant observation method is used by analyzing the qualitative information from journals, articles, books, magazines etc. for secondary data collection which could slightly reduce the objectivity and accuracy of the information.

The study can add up for studies in areas such as usefulness of ICT entrepreneurship to generate employment opportunities in Nepal. Another broader scope of the study could also explore if Nepal is a potential country for Business Process Outsourcing in South Asia. These could be other aspects of future study.

2. LITERATURE REVIEW

ICT is a generic term referring to technologies that are used for collecting, storing, editing and passing on (communicating) information in various forms (Hawkrigde, 1983). It portrays a key role in innovative thinking, in producing new ideas, methods, processes, products and organizational change, in direct linkage with entrepreneurship. In 2015, Yetis-Larsson, Teigland and Dovbysh shared that in the contemporary economy, work is increasingly becoming freelance-based while moving online.

ICT has turned the world into an information-intensive society and it is considered as the nerve of growth that can tremendously transform the economic, political, cultural, and social conditions in many developing countries (Deliktas & Kok, 2003; Hicks & Streeten, 1979 as cited in Touray, Salminen, & Mursu, 2013). A research on investments in ICT and its payoff in Malaysia showed that ICT investments are paying off in terms of economic development (Kuppusanmy & Santhapparay, 2005 as cited in Sharma & Seon Kim, 2016). ICT is playing greater role in the economic growth of developed countries as well.

2.1 Overview of ICT Education

The prospects of entering the ICT industry demands skilled workforce to cope with the constant advancements in technologies. Thus, ICT courses have been tailored by various universities, colleges and institutes to meet the demands of the market. ICT scholars and professionals need to keep abreast of new technologies to keep up with the dynamic environment of ICT.

ICT courses cover a wide range of topics which include software applications, hardware, programming, security, business applications, design, artificial intelligence, databases etc. ICT programs range from less than a week of specialized training to four year course offering certification or degree in ICT. ICT education is mostly categorized under Science or Engineering Stream. It is also categorized under Management Stream when the course is blended i.e. ICT with Management.

Some universities provide full online courses besides in campus courses. Some provide short courses on online platforms like Coursera, EdX, FutureLearn etc. The scholars can complete the short course and apply to the universities with credits received from these courses. Many institutes are providing specialized

certification courses or crash courses. Such programs also offer rigorous certification courses such as Microsoft Certification course, Oracle Certification, Cisco Certification etc.

2.2 Overview of ICT Entrepreneurship

Entrepreneurship is a process of change where innovation is the most vital function of the entrepreneur (Schumpeter, 2001 as cited in Osunde, 2014). Entrepreneurs do create workplaces for themselves and their employees, increase innovation and quickly adapt or even create market trends using available opportunities (Jakubczak, 2015). Entrepreneurship creates value not only to entrepreneurs but also to those joining the team to create goods and services.

Researchers have found that technological developments are considered to be one of the driving forces in the demand for entrepreneurship (Casson, 1995; OECD, 1996; Wennekers & Thurik, 1999; Wennkers et al., 2002 as cited in Salman, 2014). ICT entrepreneurship is the blend of the Tech Entrepreneurs, Online Entrepreneurs and ICT Consultants who provide products and services related to ICT using technology.

Tech entrepreneur applies their ideas using internet and the mobile phone/

device technology (Riley, 2011). Online entrepreneur is someone who has a real online business, and this involves having some office space, full time employees, a product or service you sell, and customers (Scocco, 2011). Some argue that to become an online entrepreneur, a dedicated office space is not a necessity since the work is done virtually online. Some ICT Consultants also work independently to cater services on the ICT based issues to various clients directly or online.

2.3 Background of Nepal

Nepal is a small landlocked country with total area of 147,181 sq. km bordered by India from the east, west and south and the northern border is shared with Tibet's autonomous region of China. Nepal terrain is distributed into Himalayan, Hilly and Terai region. Population of Nepal as of the census day (June 22, 2011) stands at 26,494,504 (Central Bureau of Statistics, 2012).

2.4 ICT Education in Nepal

According to Office of the Investment Board (IBN), every year about 5,500 students graduate with a college degree related to computers and technology. National universities such as Tribhuvan University, Pokhara University, Kathmandu University, and Purbhanchal University have courses on ICT which is run by

many colleges. Some colleges affiliated to the universities of UK, Thailand and India also provide ICT education in Nepal. Colleges provide courses like BIT, BSc. CSIT, BCA, BSc. IT, BBIS, BCIS etc. which include 100% contents related to ICT or 40% to 60% contents related to ICT with a mix of Management. Many private institutions also provide skilled courses and certification training in the areas of ICT.

2.5 ICT Entrepreneurship in Nepal

Nepal has around 34.1% of the total population in the 25-54 year old age bracket (World Population Review, n.d). This reveals that Nepal has a significant workforce. Youth entrepreneurship is one of the ways that can be the answer to problems of youth unemployment and underemployment (Jakubczak, 2015). According to Digital Nepal Framework (2019), the Digital Nepal project is expected to help grow Nepal's GDP by 3.2% at the end of initial implementation period and also increase e-commerce revenue by 2023 to US\$192 million annually at current growth rates. Nepal hopes to increase entrepreneurial activities through Entrepreneurship Development Programme (Karki, 2014).

Nepal has shown a positive growth in the field of ICT in the past few years. According to ICT Development Index (IDI) 2017 Nepal's rank in Information Technology and Communication is 140 and the IDI value has grown from 2.60 to 2.88 in comparison to 2016 (Measuring the Information Society Report, 2017). According to Office of the Investment Board (IBN), the number of Internet users in Nepal has increased exponentially in the past two decades from less than 50 users in 1995 to 14.3 million users in October 2016.

Nepal's IT space has about 500 companies with most of them focused on IT and ITES. (Digital Nepal Framework, 2019). The Government of Nepal has identified IT and business process outsourcing (BPO) as one of the 5 priority potential export service sectors in the Nepal Trade Integration Strategy (NTIS) 2010 (Federation of Nepalese Chambers of Commerce and Industry).

ICT entrepreneurs in Nepal have started up with successful services such as Online Khabar, hamrobazar.com, F1soft, Paila Technologies, Pathao, Tootle, Housing Nepal, Sasto Deal, Daraz, Leapfrog, Deerwalk, Bhoj Deals, Zefware Solutions, ITech Nepal, Semantic Creations, Incessant Rain Animation Studios, etc. These businesses are among the very few examples. Most of the ICT businesses

in Nepal are operating from Kathmandu Valley because it has favourable infrastructure for ICT. There are also many ICT Consultants and ICT tech freelancers who contribute to the ICT sector in small scale. Programs such as ICT fairs, ICT Expo and award ceremonies are conducted to acknowledge the advancements in ICT in Nepal.

2.6 IT policies, rules, regulation and plans in Nepal

Nepal has formulated various policies, rules and regulations for ICT. These documents are guidelines to address the possible issues.

Nepal imported IBM PC 1401 to conduct the census in 1971 which led to the start of computing era. National Computer Center was established in 1985 to conduct technical training.

The first IT Policy 2000 was the base for the formulation of other ICT related acts, rules, regulations and policies in Nepal. The objectives of the policy included making information technology accessible to the general public and increase employment through this means, build a knowledge-based society and establish knowledge-based industries. This policy helped build infrastructure to support IT sector, promote e-commerce and implement e-governance.

Electronic Transaction Act (ETA) – 2008 commonly known as the cyber law to address the cybercrime and online transaction issues was passed in 2006. Earlier, cybercrimes were dealt under the Public Offence Act. A new technology bill has been proposed by KP Sharma Oli administration which is said to replace the existing ETA if approved (Rai, 2019).

E-Governance Master Plan (eGMP) was developed to deliver transparent and citizen-centered government services using ICT. It initiated in 2007 under the assistance of the Government of Korea through KOICA which led to the establishment of the Government Integrated Data Center in 2008. IT Park was also established in Banepa as a subsidiary of the master plan.

National ICT Policy 2015 was developed to ensure the implementation of e-governance in most of the governmental services by 2020 and create foundational groundwork for an overarching vision of "Digital Nepal". The policy addresses the use of Cloud Computing / shared services framework, Electronic Transaction and Digital Signature and the use of Social Media to encourage inclusion and participation. The policy also focuses on promoting local and Foreign Direct Investment (FDI) in ICTs including technology transfer programs between local and foreign companies. It also focuses on lowering the barriers to entry

for local IT firms and service providers participating in government ICT projects funded through internal or international resources.

NRB IT Policy 2068 includes guidelines to ensure efficient, effective and economic IT operation by implementing appropriate IT systems in banks. It states that the banks should maintain multilevel security for Information and implement IT system audit along with data backup and recovery policy. NRB has also formulated Payment and Settlement Bylaw, 2072 which provides a guide towards electronic payment.

The Digital Nepal Framework 2019 is a blueprint for Nepal to leverage the potential of digital technologies to drive accelerated growth. The Digital Nepal Framework has introduced development in eight sectors: digital foundation, agriculture, health, education, energy, tourism, finance and urban infrastructure. Eighty digital initiatives have been proposed by the framework under these sectors. The program is expected to deliver an impact of up to NPR 800 billion by 2022.

3. RESEARCH DESIGN

3.1 Study Design

Quest of the study was to analyze the role of ICT education in developing ICT entrepreneurship in Nepal. The study used explanatory sequential mixed method. Quantitative research was adopted to collect and analyze the quantitative research questions before adopting qualitative research to explain the quantitative results. The research is descriptive in nature.

3.2 Sources and types of data

The study employed primary and secondary data information for analysis. Secondary sources such as journals, articles, books, newspapers, magazines, websites etc. were reviewed. The results of quantitative research and qualitative research were analyzed and interpreted for understanding the role of ICT education in developing ICT entrepreneurship in Nepal.

Quantitative Research

A semi-structured survey questionnaire was distributed to the respondents (ICT entrepreneurs) of Nepal. The data was then analyzed to develop questionnaire for qualitative research.

Qualitative Research

The results from the quantitative research was used to formulate the open ended questionnaire for qualitative research. Face-to-face interview and telephone interview was conducted in the study to receive insights on different aspects of the subject matter.

3.3 Sampling Design and Target Population

The study was conducted strictly within Kathmandu valley. Target population for the study was the ICT entrepreneurs engaged in ICT field in Nepal. Since most ICT companies are residing within Kathmandu Valley in comparison to other areas, the information received was generalized in case of Nepal.

Quantitative Research

Convenience sampling of ICT businesses and ICT entrepreneurs was done before deploying the semi-structured questionnaire. Fifty ICT entrepreneurs were selected for deploying the self-completion questionnaire.

Qualitative Research

After conducting the quantitative research, purposive sampling was used based on the

nature of ICT business for conducting the interview. E.g. ICT businesses providing Software solutions, Hardware solutions, ICT Consulting solutions and online business portals. Face-to-face interview

with 5 respondents and telephone interview with 2 respondents was conducted to gather views on the topic. Telephone interview was conducted only when the chosen respondent preferred to do so.

4 . DATA PRESENTATION AND ANALYSIS

4.1 Descriptive Analysis

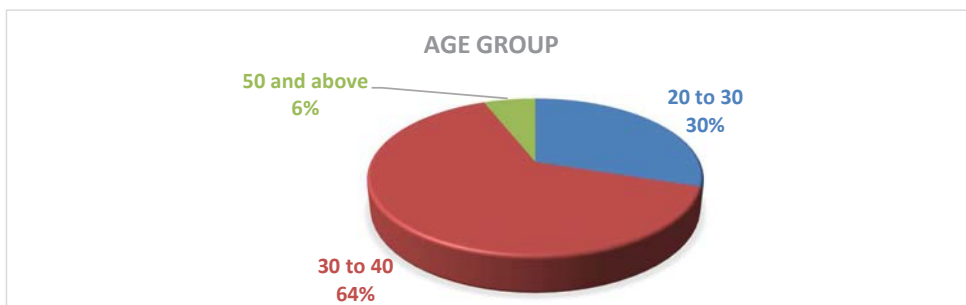


Figure 1 Age Group of Respondents (in Percentage)

All respondents were male with more than half within the age group of 30 to 40. 30% of respondents were between the age of 20 to 30 and only 6% were 50 and above. The highest number of years of service by a company is 19 years and the lowest is 1 year among the respondents who prefer to use terminologies such as Digital Storyteller, IT officer, Technical Analyst, Chief Executive Officer, Software Engineer, Web Developer, VP - IP Engineering, Principal Member

Technical, Director, Vice President, Managing Director, Software, Board Member/ Software Developer, Consultant, Founder, CTO, Chief Systems Integrator, Co-founder, Director of Product, COO, Senior Developer, Executive Director, Owner and IT Consultant as their position. Among the respondents, 21 ICT businesses catered to the clients within Nepal, 13 catered to the clients abroad and 16 served within Nepal and also abroad.

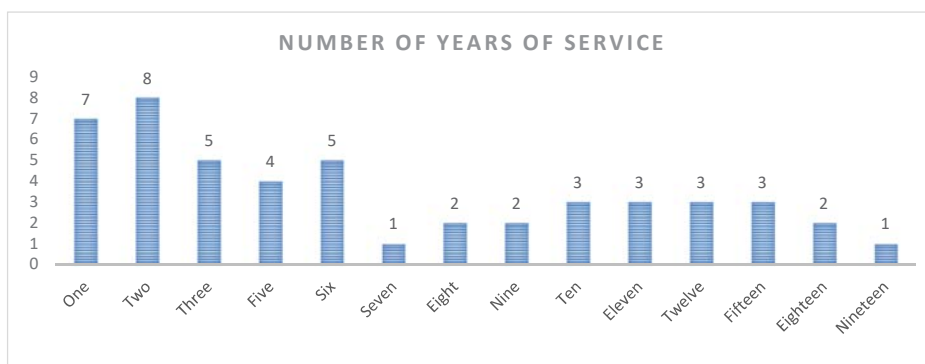


Figure 2 Number of years of service since establishment of ICT business (in Frequency)

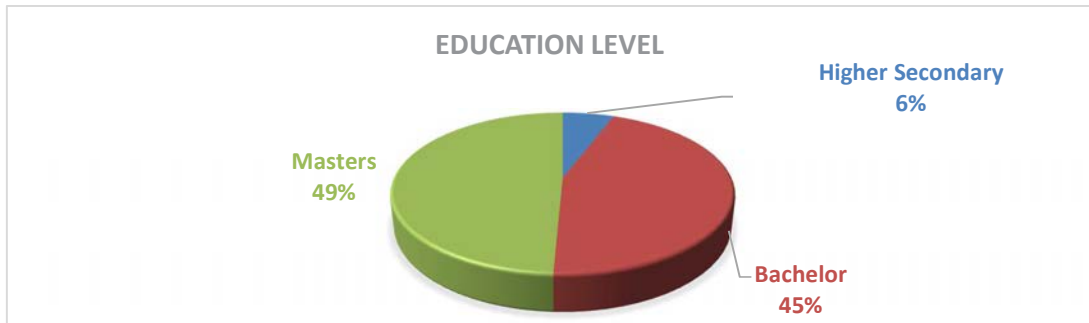


Figure 3 Education level of Respondents (in Percentage)

Almost half the respondents have completed Masters' Degree followed by Bachelors degree and only 6% had completed Higher Secondary Level. Among them 84% respondents have ICT major in college. Slightly less than nine-tenth of the respondents have taken

specialized training on ICT while 14% have not had any specialized training in ICT but were from within the pool of those who have ICT major in college. Out of them, 35 started ICT business while still studying or training and 14 respondents started after completion.

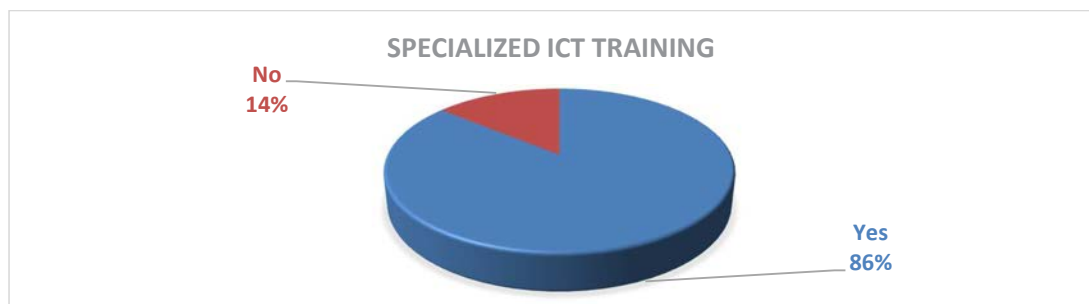


Figure 4 Respondents with specialized ICT training (in Percentage)

Figure 5: shows that most respondents started the business to compete with others, followed by wanting to earn more money/ become rich, wanting to be their own boss, wanting to do something new, wanting to realize their ideas/ vision, wanting to do what they liked doing (their passion/ hobby) and to be respected. Among the

respondents, 45 ICT entrepreneurs had other options, but they recognized a business opportunity in ICT so they chose to start up their business. This was followed by 8 respondents who did not want to work for others. Only 2 responded that they did not have another choice. Respondents also mentioned other reasons such as: starting

business to execute abilities as a key player of the team; and wanting to work in new field and gain experiences. Little less than 40% chose ICT because they were primarily interested in ICT/it was

partly their hobby while 22% respondents entered ICT sector because their academic qualification is in ICT, and they recognized a business opportunity in ICT.

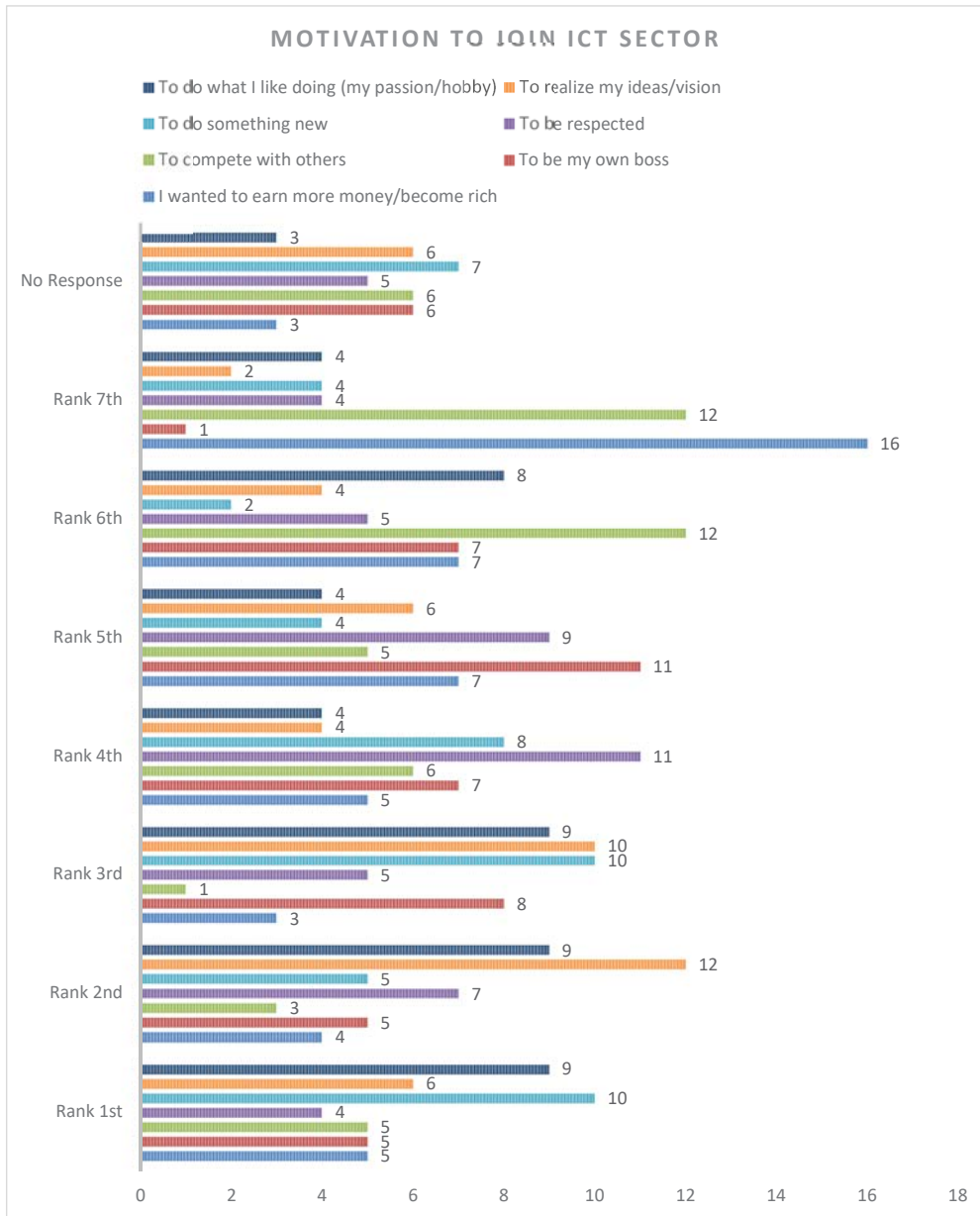


Figure 5 Ranking of Motivation to join ICT sector (in Frequency)

Other Entrepreneurs are major influencers for most ICT entrepreneurs to start ICT business followed by friends. Forty percent of respondents received Personal loans from family and friends and also used their personal savings to start their

business while few received funds through Bank Loan; Credit, loan, seed funding or subsidies (from the government, micro-credit institutions, NGOs or other non-commercial Financiers) and Cooperative Societies for their business.

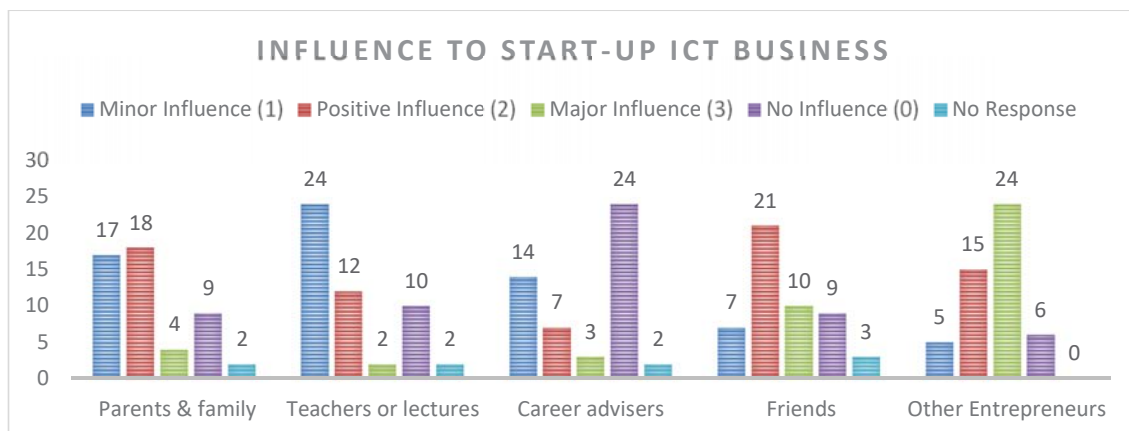


Figure 6 Influence to start-up the ICT business (in Frequency)

More than 90% respondents agree that ICT education motivates graduates to use ICT in business but only 72% think that ICT education motivates graduates to become ICT entrepreneurs. More than 80% think that such courses have stimulated the growth of ICT business. However, 90%

do not agree that the courses provided by the universities and colleges in Nepal is sufficient. Interestingly, all respondents think that extra courses or training are required for the successful running of ICT based business in Nepal.

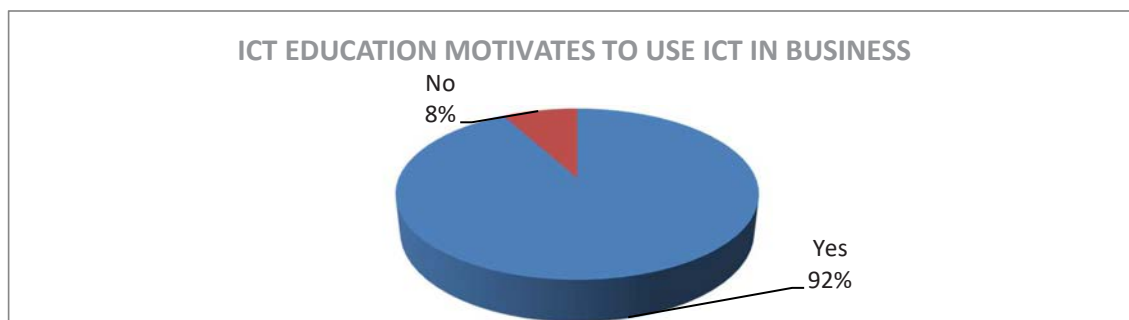


Figure 7 ICT education motivates ICT graduates to use ICT in their business (in Percentage)

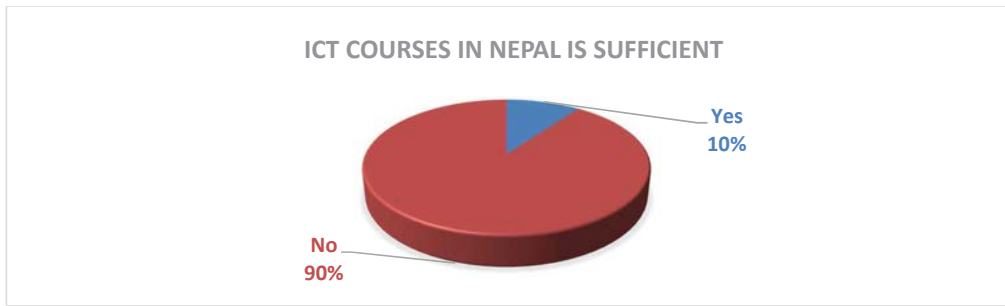


Figure 8 ICT courses provided by universities and colleges in Nepal is sufficient for ICT entrepreneurs (in Percentage)

84% hire employees from other streams while only 16% hire core ICT personnel for their business. The respondents have mentioned hiring employees from any stream as long as they are competent in

computer programming and have passion for IT. They also hire people from different streams to fulfill the supportive functions of business.

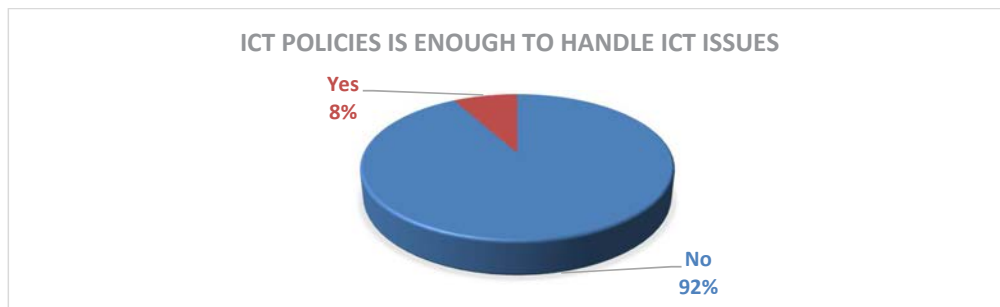


Figure 9 The policies related to ICT in Nepal is enough to handle ICT business related issue (in Percentage)

Less than 10% of respondents feel that the policies related to ICT in Nepal is enough to handle the ICT business related issues.

Similarly, only 14% think that the current ICT infrastructure of Nepal is encouraging for ICT business.

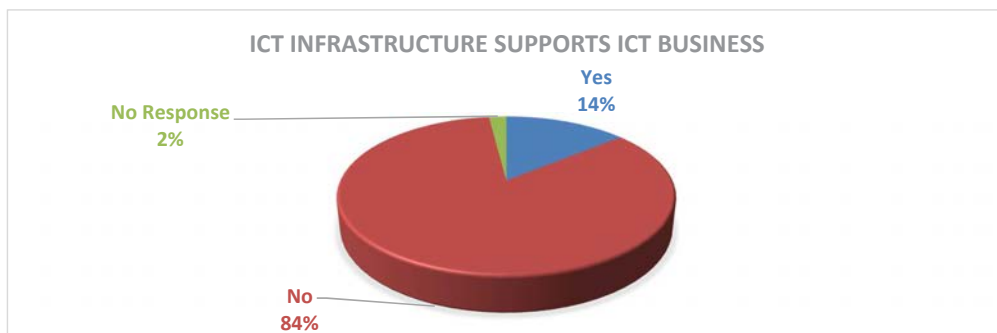


Figure 10 The current ICT infrastructure of Nepal supports ICT business (in Percentage)

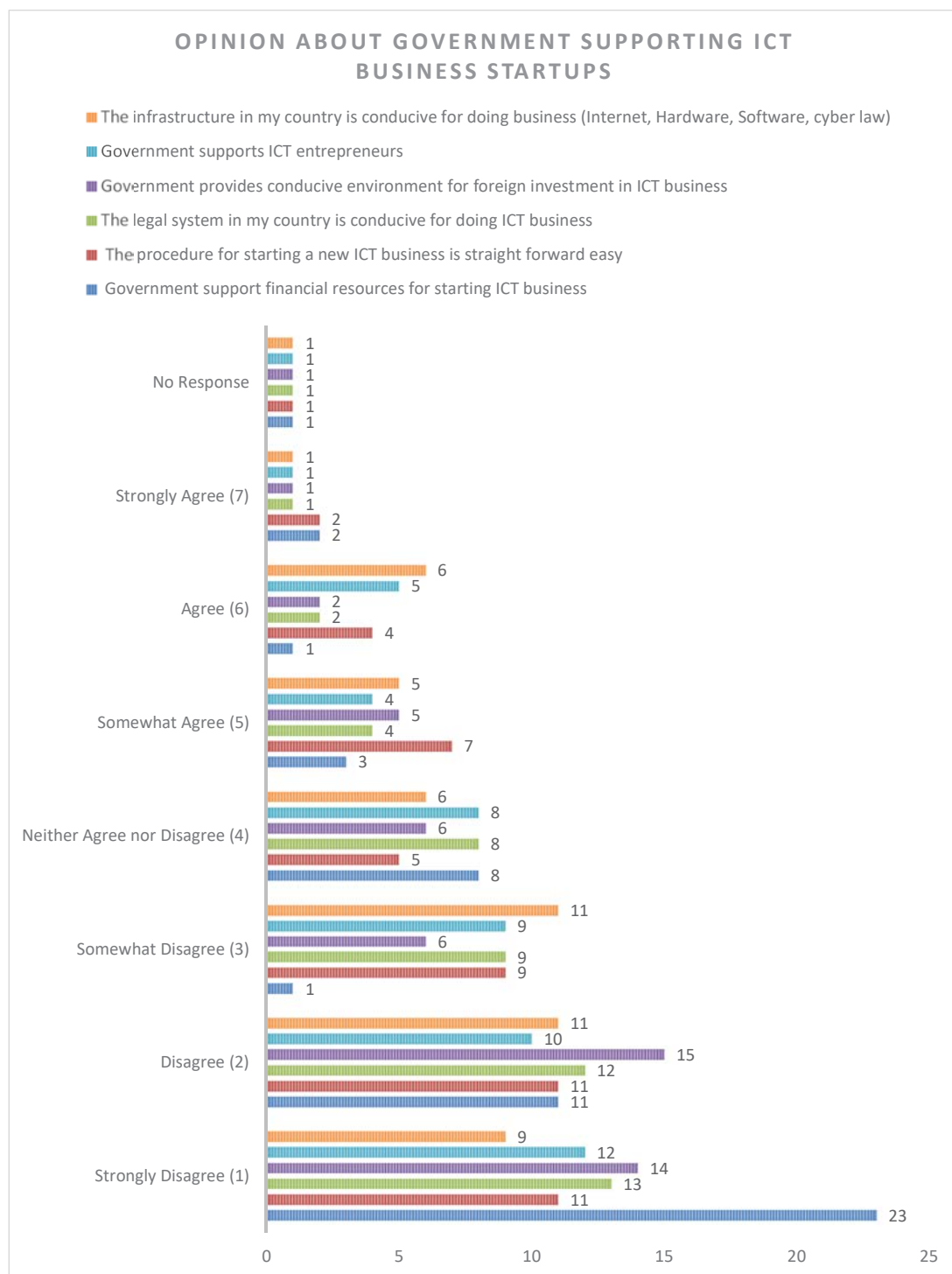


Figure 11 Respondent's opinion about Government supporting ICT business startups in Nepal (in Frequency)

Figure 11: shows the perception of respondents towards government supporting ICT startups in Nepal. Only two respondents strongly agree that: Government supports financial resources for starting ICT business; and the procedure for starting a new ICT business is straight forward easy. Only one respondent feels that: The infrastructure in my country is conducive for doing business (Internet, Hardware, Software, cyber law) and

Government supports ICT entrepreneurs; the legal system in my country is conducive for doing ICT business and Government provides conducive environment for foreign investment in ICT business. More than 5 and less than 9 respondents are neutral towards the Government. Less than 24 respondents strongly disagree on Government providing support for starting ICT business.

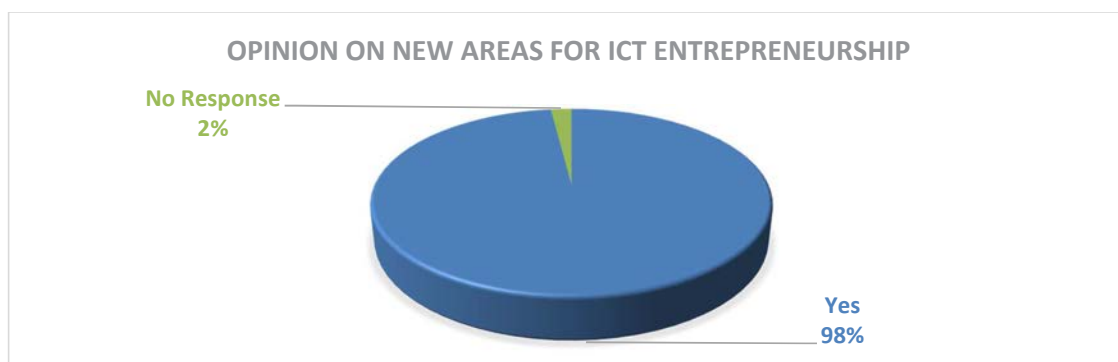


Figure 12 Opinion on new areas to be covered through ICT entrepreneurship (in Percentage)

More than 90% of respondents think there still are new areas that can be covered

through ICT entrepreneurship and that the market has not been saturated.

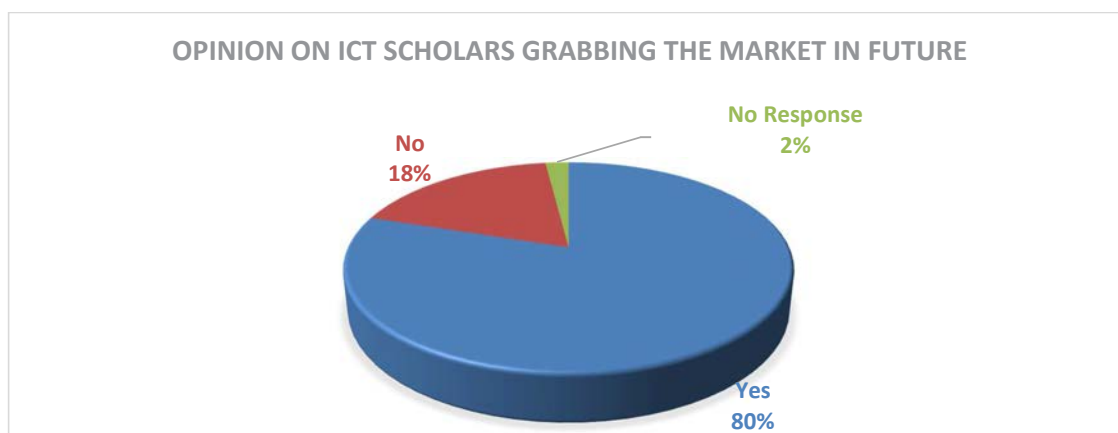


Figure 13 Opinion on ICT scholars grabbing the market as ICT entrepreneurs in future (in Percentage)

80% of the selected respondents think that the future market of ICT will be grabbed by ICT scholars. Interestingly, more than three fourth of the participants also think that the future market of ICT will be grabbed by scholars from academic streams other than ICT as ICT entrepreneurs.

Successful ICT entrepreneurial activities in Nepal

Digital Payment, Khalti Digital Wallet, eSewa, f1soft, Work Around, Paaila, Tootle, Hamro Patro, Bitsbeat, Braindigit, Eminence Ways, SunBi, Mercantile, Leapfrog, Deerwalk, Janaki Tech, SPI, World Link, ebPearls, Javra, PCS, Incessant Rain Animation Studios, ITech Nepal, Semantic Creations, Om Networks, Subisu, Mpercept, Wordpress Meet-up organised by Ujjwal Thapa & Team, Digital Banking, fuse machines, IME Pay, Hamro Bazar, Daraz, IMS POS, Sarathi Cab Service, OLE Nepal, Green Growth Group, Ipay, ISP, telco, Hardware, online businesses, VAS services, Mandala, CAN Info Tech Conference, Nepal ICT Expo, Women Technopreneur, Hackathon, IT Meet, Cloud Services, ICT Education, Foodmandu, IT Lab (Ref. NTA), Incubation Centre (Ref. NEA), Training/Workshop (Ref. Antarprerana), Competition (Ref. King's College), MBA in Global Leadership and Management (Ref. SoMTU), digital currency, e-commerce, bootcamps, Buzzketing, Zen IT Hub,

Outsourcing, Regular IT startup meet up and fund challenges, launch of different concept mobile apps, software outsourcing, increase in numbers of computerized and online billing system with POS and local payment gateway, digital wallet, Bhoj deals, ThirdWheelNepal, Digital Newspapers, Online Shops, Robot restaurant assistant from Paaila Technologies, Various AI based chatbot and other products created by FuseMachines, GIS and CAD software developed by Smart Tech. Microsoft Windows development and research center from Unlimited Newmedia, Inbound and Outbound Outsourced IT projects from CloudFactory, Cotivity and many similar companies.

4.2 Findings of Interview

A face-to-face interview was conducted with 5 respondents and telephone interview was conducted with 2 respondents to understand views and opinions of ICT Entrepreneurs.

The ICT entrepreneurs shared that they chose ICT business because they saw the potentiality to grow and sustain easily in the long run. Along with the years of service, their clientele has increased along with experience in handling new and challenging jobs. They feel that the exposure to ICT through the courses provided by universities, colleges and institutes motivate scholars for ICT

business start-up. The teachers, friends and other entrepreneurs are main influencers for scholars to join ICT business. However, they think that the current academic qualification is not sufficient for successful evolution of ICT based industries as the syllabus is not updated according to the advancements in technologies worldwide. They believe that ICT education only provides technical know-how but does not provide the essential skills to start business. Most ICT entrepreneurs experiment through hit and trial method to start-up ICT related business.

ICT is about practice, so the industry hires graduates or scholars from any stream, who show a keen interest or aptitude in ICT. Employment is also generated for support functions such as administration, accounting legal etc. They share that the problem is not much in education but in the mindset due to which unclear business process, policies and practices are in place.

ICT industry needs to be updated so, the talented pool of ICT workforce put their own efforts to learn about new technologies. Since, the businesses do not invest in training, it is challenging to retain talented workforce. Businesses try to keep themselves competent by initiating changes, procuring required resources and also sharing it with other tech experts through trade fairs, meetings and seminars. However they also share that unlike the

clients abroad, some people in Nepal do not trust outsourcing and working virtually.

The respondents feel that the policy, rules and regulations of Nepal do not provide clarity in business process transactions between the federal, provincial and local levels. They feel that some policies control freedom of expression. The policies try to open doors yet limitations exist leading to increase in expenses and reduction in benefits. Some respondents also feel that the government lack proper mechanism to ensure awareness among citizens about new IT bills and policies. However, they involve themselves in ICT community to share and debate about different policies and new proposed bills. They also feel that their voices are unheard of.

Youths with great ideas are unable to start ICT businesses although government has introduced schemes and mentioned in the policy about supporting start-ups. The root cause is process, practice and favor culture which is visible on multiple levels. They also share that the ICT entrepreneurs working in government projects face some level of corruption which leads to quality compromise. The concept of co-working space has been introduced and is being implemented which has helped young entrepreneurs with less capital to enter ICT business. However, the concept of sharing space or co-working is not mentioned clearly in policy.

The respondents share that the policies related to safety, security, data manipulation, compensation and online transaction do not readily meet business oriented needs. The taxation policy also acts as a hindrance for new ICT business. Sometimes, intermediaries play a vital role in solving tax issues which also demotivates ICT entrepreneurs. The respondents think that the government is unable to understand the rapid change in business model caused by ICT use. E.g. the confusion in taxation of businesses such as tootle and pathao. Most online services are working as logistic companies because the system is unclear. E.g. online businesses selling organic groceries take orders online, but the transaction is cash on delivery and they have to deliver the products themselves. There are also risks of not getting paid.

The respondents believe that there has been a significant upgrade in the ICT infrastructure, internet services, and power. However, they feel that software infrastructure is not satisfactory. The problems related to proper e-payment gateway and guidelines have led to difficulties in buying server hosting domain, hardware and network. They also point out the process complications of hiring experts from other countries and creating dollar account. They feel that FDI process is also not as easy as

stated in policy. The regulation policy for the online payment system eSewa was recognized by NRB after many years of its implementation showing a lack of quick response. They also share about problems faced in the Department of Customs.

They also share that Nepal is way behind in cyber security. Several issues in banking sector, and hack of the official government site .gov.np are some examples. However, they express that such challenges are not faced by Nepal government only but also by governments abroad. The respondents do not think that the government has been able to provide proper Intellectual Property Rights and also share about obstacles such as lack of integrated or aggregated data.

Despite hardships, the respondents feel that ICT products and services are in par with international standards. Robots in restaurants, digital payment systems and online purchases are some examples of innovation in Nepal which is being slowly adopted by consumers. Other businesses are also embedding ICT systems to reduce costs and increase service delivery.

The respondents feel that the government is constantly trying to support ICT entrepreneurship and growth through various schemes. But, since most ICT entrepreneurs have higher expectations from the government; the government fails to receive deserved positive reactions.

There are many areas that ICT businesses have not tapped yet which presents more opportunities compared to challenges. So, the existing and upcoming generation of ICT entrepreneurs could possibly tap those new areas to sustain the ICT industry.

4.3 Analysis and Interpretation

ICT related courses provided in the universities, colleges and training institutions in Nepal are a motivating factor for the start-up of ICT related business. Most ICT entrepreneurs' start-up before graduating from college, which is due to the exposure to ICT industry through teachers, friends, parents and other entrepreneurs. However, the courses on ICT provided by the universities and colleges are not viewed as effective when compared to specialized courses offered by training institutes. The specialized training certification is seen as more valuable by ICT entrepreneurs.

Although some ICT entrepreneurs believe that doing ICT business depends on the mindset of the person, they suggest that the ICT entrepreneurs should possess some sort of specialized training or academic degree in ICT related subject areas for successful start-ups and for sustaining in future. Scholars from all disciplines with ICT aptitude are preferred by the market.

The physical infrastructure has improved and issues of electric power has been solved in comparison to past few years, encouraging the flourish of ICT business. Some ICT entrepreneurs express negativity towards the government and its efforts to provide a conducive environment for ICT business. But, this scenario can be interpreted as occurred due to higher expectations. The issues of corruption also hinder the development of ICT businesses.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Nepal is budding with investment opportunities which can yield higher returns through entrepreneurial activities. ICT entrepreneurship is also growing rapidly with the development of information super highway and cloud technology in Nepal. Thus, Nepal is turning itself into ICT hub by starting ICT businesses that are competent enough globally.

Most ICT entrepreneurs have joined the ICT business because they are passionate about their work and have recognized business opportunities. ICT education acts as a catalyst to motivate graduates towards ICT business since teachers, lecturers and like-minded scholars get an opportunity to share ideas and get closer to the industry. However, the future market doesn't need to be captured by only ICT scholars. Scholars from other areas possessing a keen interest in ICT could also fulfill the market needs.

In a world of fast moving and evolving technologies, the emergence of new applications and business processes is creating disputes as to how technologies and players should be regulated. Nepal Government has been formulating ICT policies, rules and regulations, but the gap

in the development of new policies, rules and regulations have led to problems in addressing burning issues. There are some loopholes in ICT policies and practices of Nepal. However, the challenge to address the ever changing needs of ICT industry is alike in developed countries.

In the recent years, Nepal government has shown concern to formulate better policies to govern the ICT industry. Some existing policies are in the process of amendment and some are being formulated to ensure positive environment for ICT start-ups and ongoing businesses. Various schemes introduced by the government is also an optimistic sign for ICT entrepreneurship development. Although, many ICT entrepreneurs are skeptical, it is evident that Nepal has been putting efforts to flourish ICT business. The ICT courses and exposure to ICT businesses have increased ICT business potential in Nepal. This would benefit the country by ensuring economic growth. Moreover, it would also help reduce unemployment by creating jobs for potential pool of ICT scholars in Nepal. Thus, we can conclude that ICT education plays a vital role in developing ICT entrepreneurship in Nepal.

5.2 Recommendation

ICT Entrepreneurship is flourishing in Nepal. However, there are certain areas that could be touched upon to make sure that the environment is promising for ICT entrepreneurs to work effectively and efficiently without doubts.

- The universities and colleges of Nepal should review their course and teaching methods to effectively impart practical skillset required by scholars to join ICT industry.
- Strong policies related to Electronic Transaction Act should be formulated to address issues related to e-payment, cyber security and data manipulation.
- The policies should be upgraded within every 5 years to address new issues in ICT business.

6. REFERENCES

Hawkridge, D. (1983). *New information technologies in education*. London: Broom Realm.

Information Technology/ ICT - Federation of Nepalese Chambers of Commerce and Industry [FNCCI]. (2019, April 5). Retrieved from <http://www.fncci.org/information-technology-ict-151.html>

Jakubczak, J. (2015). Youth entrepreneurship barriers and role of education in their overcoming-pilot study. *Managing Intellectual capital management, and innovation for sustainable knowledge and learning and inclusive society*, 1775-1782.

Karki, B. (2017). Entrepreneurship development programme with reference to small enterprises in Nepal. *Janapriya Journal of Interdisciplinary Studies*, 3 (16).

International Telecommunication Union. (2017). Measuring the information society report. CH-1211 Geneva Switzerland: International Telecommunication Union. Retrieved March 21, 2019, from https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2017/MISR2017_Volume1.pdf

Neupane, N. (2018, January 20). Nepal added over 250 internet users per hour. *The Kathmandu Post*. Retrieved from <http://kathmandupost.ekantipur.com/news/2018-01-20/nepal-added-over-250-internet-users-per-hour.html>

Office of the Investment Board (2019, March 29). *Information communication technology*. Retrieved from <https://www.ibn.gov.np/ict>.

Osunde, C. (2014). Entrepreneurs and entrepreneurship in developing countries: The Nigerian experience. *The SIJ Transactions on Industrial, Financial & Business Management*, 2(2), 26-31.

Rai, B. (2019, February 20). New information technology bill could kill innovation in Nepal, experts warn. *The Kathmandu Post*, Retrieved from <https://kathmandupost.ekantipur.com/news/2019-02-20/new-information-technology-bill-could-kill-innovation-in-nepal-experts-warn.html>

Riley, I. (2012, April 10). Who is a tech entrepreneur? Any in the Caribbean? Retrieved from <https://jamaicans.com/techentrepreneurcaribbean/>

Salman, D. M. (2014). The Impact of Economic Freedom on Entrepreneurs' Activities and Economic Growth: New Evidence From Cross-Country Data. In *Economic Research Forum Working Papers* (No. 868).

Scocco, D. (2011). What's an online entrepreneur? Retrieved from <https://www.dailyblogtips.com/whats-an-online-entrepreneur/>

Sharma, A & Seon Kim, Y. (2016). *Information communication technology development in Nepal*. Institute for Poverty Alleviation and International Development.

Touray, A., Salminen, A., & Mursu, A. (2013). ICT barriers and critical success factors in developing countries. *The Electronic Journal of Information Systems in Developing Countries*, 56(1), 1-17.

Welsum, D. (2013). *Enabling digital entrepreneurs*. Washington, DC: World Development Report.

World Population Review – Nepal Population 2019. (n.d.). Retrieved April 17, 2019, from <https://www.worldometers.info/world-population/nepal-population/>

7. ANNEX

7.1 Self-Completion Questionnaire Survey

Dear Respondent,

The Center for Knowledge Management and Information Technology (CKMIT) is conducting a study on "Role of ICT Education in ICT Entrepreneurship Development" under the supervision of the Research and Consultancy Department of Nepal Administrative Staff College to understand and analyze the role of ICT education and its relation with ICT entrepreneurship development. I would like to request you to provide your valuable response in completing this research work. Your responses will be kept confidential and will be used only for research purpose.

Looking forward for your cooperation!

Section I: Respondent Profile

Name (optional):

Gender: Male [] Female []

Age (In years): < 20 [] 20 – 30 [] 30 – 50 [] 50+ []

Organization Name:

Designation:

Location:

Organization established in number of years:

Clients: Within country [] Abroad []

Section II: Questionnaires

1. What is your education level?

- a. +2
- b. Bachelor
- c. Masters

2. Is your major subject IT in college?

- a. Yes
- b. No

3. Have you had any training or specialized course in IT?

- a. Yes
- b. No

4. Since when have you been engaged in IT sector?

- a. While still studying / training in IT
- b. After studies / training in IT

5. What motivated you to join ICT sector? Rank the following statements. You may exclude statements which you don't favor.

S.N.	Motivation	Rank
1	I wanted to earn more money/become rich	
2	To be my own boss	
3	To compete with others	
4	To be respected	
5	To do something new	
6	To realize my ideas/vision	
7	To do what I like doing (my passion/hobby)	

6. Was starting a business your only option or did you have other options?

- a. I did not have another choice
- b. I did not want to work for others
- c. I had other options, but I recognized a business opportunity in ICT
- d. Others

7. Why did you choose an ICT based business?

- a. I am primarily interested in ICT/it was partly my hobby
- b. My academic qualification is in the field of ICT
- c. I recognized a business opportunity in this sector

8. Who influenced you to start-up a business?

S.N.	Influencer	Major Influence (3)	Positive Influence (2)	Minor Influence (1)	No Influence (0)
1	Parents & family				
2	Teachers or lectures				
3	Career advisers				
4	Friends				
5	Other Entrepreneurs				
6	Media coverage of businesses and business people				

9. What kind of start-up financing, if any, did you obtain?

- a. Personal loans from family and friends
- b. Personal savings
- c. Cooperative Societies
- d. Bank Loan
- e. Credit, loan, seed funding or subsidies (from the government, micro-credit institutions, NGOs or other non-commercial Financiers)

- 10. Do employees require ICT academic qualification or specialized training to get hired in your organization?**
 - a. Yes
 - b. No
- 11. Is your organization employing graduates from other stream besides IT?**
 - a. Yes (if yes, what stream?)
 - b. No
- 12. Do you think ICT education motivates IT graduates to use ICT in their business?**
 - a. Yes
 - b. No
- 13. Do you think ICT courses provided by universities and colleges in Nepal is sufficient for ICT entrepreneurs?**
 - a. Yes
 - b. No
- 14. Do you think extra course or training is needed for successful running of ICT based business in Nepal?**
 - a. Yes
 - b. No
- 15. Does ICT education motivate IT graduates to become an ICT entrepreneur?**
 - a. Yes
 - b. No
- 16. Do you think ICT courses in universities and training institutes have stimulated the growth of ICT business?**
 - a. Yes
 - b. No

17. Do you think the policies related to ICT in Nepal is enough to handle ICT business related issues?
- Yes
 - No
18. Do you think the current ICT infrastructure supports ICT business?
- Yes
 - No
19. What is your opinion about Government supporting ICT business start-ups in Nepal? Here are 6 statements, for each statement, choose one value from 1 to 7.

S.N.	Opinions	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
1	Government support financial resources for starting ICT business.							
2	The procedure for starting a new ICT business is straight forward easy.							
3	The legal system in my country is conducive for doing ICT business.							
4	Government provides conducive environment for foreign investment in ICT business							
5	Government supports ICT entrepreneurs.							
6	The infrastructure in my country is conducive for doing business (Internet, H/W, S/W, cyber law).							

20. Do you think there are many areas that can be covered through ICT entrepreneurship?
 - a. Yes
 - b. No
21. Do you think the market is saturated for ICT entrepreneurs?
 - a. Yes
 - b. No
22. Do you think ICT scholars will grab the market as ICT entrepreneurs in future?
 - a. Yes
 - b. No
23. Do you think people having major subjects or academic qualification besides ICT will grab the market as ICT entrepreneurs?
 - a. Yes
 - b. No
24. Can you name some successful ICT entrepreneurial activities in Nepal?

.....

.....

.....

.....

Thank You for your cooperation

7.2 Interview Questionnaire

1. Why did you choose ICT based business?
2. Do you think the current Academic qualification of the IT graduates is sufficient for the success or evolution of ICT based Industries?
3. Is extra Courses or trainings needed for the successful running of ICT based Business?
4. Are you employing graduates from other stream rather than IT for your business?
5. Do your employees demand for further training?
6. Does the current ICT infrastructure support your business?
7. What are the Infrastructure / resources lacking in entrepreneurship development?
8. What is/are the hardest obstacle to overcome in order to achieve intended success in IT business?
9. Does role of ICT in entrepreneurship development lead to employment generation?
10. Do you think there has been innovation in services through the use of ICT?
11. Do you think the government is supporting for ICT growth in Nepal?
12. Do you think the policies related to ICT is enough to handle ICT business related issues?
13. Is market demand sufficient with respect to the ICT companies being established?
14. Does ICT education motivate IT graduates to become an entrepreneur and use ICT in their business?



Center for Research and Development
Research and Consulting Services Department
Nepal Administrative Staff College
URL: www.nasc.org.np
Phone: +977-1-5522002, 5522160, 5523514, 5523517
Fax: +977-1-5524906
E-mail: rcsd@nasc.org.np

