

The Emergence of University Entrepreneurial Orientation in a Technological University: A Case of a Sri Lankan National University

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Abstract

The role of higher education institutes is gaining increased attention as a key determinant in economic and social development of a country. Education systems in South Asian countries especially the technology stream concentrates on development of knowledge where entrepreneurial attitude and skills development aspects have been mostly neglected. However, by re-designing and reforming university system to facilitate and promote entrepreneurial ecosystems, few universities have gained attention. In addressing this need, ABC University, the most sought after technological university in Sri Lanka, launched a range of entrepreneurial initiatives to craft the enterprise capabilities of undergraduates. ABC University has been able to facilitate an increasing number of start-ups. However, the dynamics and perceived effectiveness of such phenomena are relatively less explored, and its successful implementation requires the adoption of different approaches, in different

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contexts. The main motivation of the study was to investigate stakeholders' attitudes towards these initiatives while exploring the dynamics and key success factors contributing to the effectiveness of entrepreneurial eco-system. The study adopted a qualitative methodology with in-depth interview as the main method. In-depth interviews were conducted with the key stakeholders selected based on purposive sampling. Thematic analysis of qualitative interview data revealed that transformational leadership style created a dynamic entrepreneurial strategy and inspirational motivation that facilitated radical change. The analysis revealed many interesting facets of the success including how complex relations to foreign universities and expatriate academics influenced the process, effect of existing reputation of the university and how structural changes reduced the barriers. Student focused programmes have to be initiated before institutionalizing entrepreneurship via curriculum amendments and before changing the university organizational structure. This study provides insights on how to enable entrepreneurship in local public university system.

Keywords

Entrepreneurship; Technological University

Introduction

When it comes to the context of developing countries in South Asia, these countries are widely regarded as countries that do not have effective plans to promote entrepreneurship at national level. Education systems of these countries emphasize on development of knowledge aspect where attitude development and skills development have been taken lightly or neglected (Perera, 2019). Development of entrepreneurship, which is mostly a subtle blend of knowledge, skills and attitudes need a deep and an exciting practical focus which is lacking in education system of these countries. The main reasons for this lack of interest in entrepreneurship education at early age are incapability of understanding the importance and restraining its meaning to start of a classical business (Kalugalagedera & Kaushalya, 2017).

In these countries, bulk of parents impose career objectives at young age which throttle entrepreneurship (Marambe, 2015). The core areas of academic activities such as mathematics, commerce or science are focused which does not

allow the students time to explore business world and develop their innovative skills (Murnieks, Mosakowski & Cardon, 2014). Lack of availability of resources and the indolent approaches of policymakers further intensify the plight of entrepreneurship education in South Asia (Ghina, 2014). The socialist economic policy implemented in Sri Lanka before 1977 promoted many indigenous businesses and industries because regimes promoted local businesses and public sector to achieve economic growth. From 1977, where liberal economic policy was adopted, indigenous businesses have to compete with foreign products, processes, and technologies and the growth of the country now largely depends on the private sector entrepreneurs (Muthukutti, 2018). Local business environment also gives little support to entrepreneurship activities as evident from low ranking in Ease of Doing Business (102nd rank in 2018). Also Global Entrepreneurship Index (GEI) ranked Sri Lanka at 96th place in 2017.

As stated in the analysis of education system of South Asian countries, primary and secondary education sectors of Sri Lanka, give slight attention to entrepreneurship skills development. The Advanced Level examination which filters students to state universities is a highly competitive examination where only about 25,000 students are selected from about 300,000 students who sit for the examination (Kalugalagedera & Kaushalya, 2017). In this background, students vehemently follow theoretical education leaving little time and interest for skills and attitudes development related to entrepreneurial behaviour. In the traditional society, where being a professional is more celebrated than being a successful entrepreneur, students neglect business entrepreneurship as a career path. Even those who engage in business mostly do it as a result of rejection from higher education system and possess little innovativeness skills, risk taking behaviour and pro-activeness instilled in them which leads to multiplication of existing business products/services or models with little novelty. The failure is inevitable in this context. It is with this background student enter state universities in Sri Lanka for higher education.

If Sri Lanka is to overcome the middle-income trap and attain greater income index, its economic transformation must be based on innovation (Hewage, 2019). Developing an entrepreneurial culture within universities of Sri Lanka is essential as the technologically knowledgeable graduates of these universities can contribute immensely to high-tech start-ups and export sector with competitive products and services.

Entrepreneurial mindset can be persistently developed at any stage of life (Murnieks, Mosakowski & Cardon, 2014). University education makes graduates capable of thinking in a unique manner, which leads to fruitful entrepreneurial happenings (Hazzouri, Carvalho & Main, 2014). Education in entrepreneurship has become an essential ingredient in curriculum mainly in university education in Sri Lanka. It is noted that students very rarely attempt entrepreneurial career during academic life in higher education institutes (Kabir, Haque & Sarwar, 2017). This creates questions as to whether the entrepreneurship education is really taking in place in local university system.

Considerable research has been carried out on helpfulness of entrepreneurial drives at university level, but few studies have focused on overall orientation (Ghina, 2014; Mani, 2017). Many studies have focused on few areas of the entrepreneurship such as academic curriculum, training of staff and students and development of university policies but it should be acknowledged that entrepreneurship is affected by the entire system.

ABC University was established 40 years ago as a technological higher education institute in Sri Lanka. Recently it developed a novel system covering teaching, learning and assessment aspects and some structural changes, mainly in undergraduate degree program of engineering students, with the intention of inculcating more entrepreneurial skills. The researchers have observed these initiatives have given rise to stimulate entrepreneurship among engineering undergraduates for last five years. However, this singularity has not been studied with reference to its mechanism, dynamics and effectiveness. Thus, this research aims to investigate the broader eco-system of the university including culture, leadership and co-curricular initiatives that shape entrepreneurial skills of its undergraduates. This study aims to analyse the orientation for entrepreneurship of ABC as a case study where deep insights can be obtained. In order to accomplish the above objectives, the following sections of the research paper are organized. First it presents a review of literature relevant to entrepreneurship in higher education institutes and then it briefly introduces the entrepreneurial initiatives introduced in the ABC University. Next sections explain methods adopted to carry out the study and the discussion of findings of qualitative in-depth interviews.

Literature Review

Entrepreneurship Education

Fayolle (2009) stated that entrepreneurship education is the set of activities which aims to develop attitude, skills and knowledge in order to generate ideas, start-ups and innovations. However, by giving a border and narrower definition for entrepreneurship education, Kourilsky (1995) defines it as recognizing the opportunities, arranging the resources for create a business venture. On the other hand, Bechard & Toulouse (1998) define it as set of collected teaching materials to inform, train and educate a person who has the thirst in creating a business.

Entrepreneurial education provides opportunities to be responsible, enhance necessary skills, knowledge and attitude. The classic entrepreneurial education which is taught across all subjects helps individuals to be employable (European Commission, 2017). Supporting the argument, Cavaller (2011) and Ceptureanu (2015) highlighted that entrepreneurship education makes better quality entrepreneurs. Basu & Biswas (2013) proved that entrepreneurial education impact positively on small business formation.

In order to enhance the entrepreneurial education, academic staff should have to focus on, innovative teaching techniques, entrepreneurs and entrepreneurship, creative techniques and incubating student's ideas (Ceptureanu, 2015). Further, this study highlighted that if any university needs to enhance the entrepreneurial engagement, they should, firstly consider organizational norms and cultures should be taking in to account, secondly, take the support from all the levels of the university hierarchy and finally, consider students as central people of these activities.

Piperopoulos (2012) stated that the structure and the leadership are important to promote the culture of entrepreneurship in an organization. This is mainly because the role of the change agents in an organization (Work, 1996; Spreitzer, Janasz, & Quinn, 1999). Eyal and Kark (2004) investigated the non-profit school system using 1,395 teachers and recognize the link between entrepreneurial strategies and different styles of leadership. The results evidenced that the most suitable leadership style is transformational leadership for radical entrepreneurship.

As per Shamir, House and Author (1993), Transformation leaders may create cycles of recognition of followers, internalization of beliefs, emotional

bonding and social contagion by influencing their followers. Hence, subordinates also committed towards achieving the collective goal while sacrificing their personal interests (Bass, 1985). This implies that radical entrepreneurship of transformational leaders can be taken as a tool to identify, motivate the followers to contribute to the development of the business. Further, the above mentioned authors argued that for the development of the vision and strategies of an organization, the involvement of transformation leaders is essential. Henceforth, they confirmed that motivating the followers, generating a vision which is enlightening are some of the dynamics in radical entrepreneurial activism (Vecchio, 2003; Baron, 2002; Baron & Markman, 2000). Therefore, it is identified that transformation leadership is a success factor to influence others, grow devotion, loyalty and enthusiasm while creating a base for radical entrepreneurship.

Kuttim, Kallaste, Venesaar, and Kiis (2014) stated that Theory of Planned Behaviour can be taken as a base for entrepreneurial education and to increase the intention of students for entrepreneurship. The study was cross-sectional in nature based on 17 European countries which has divided as efficiency-driven and innovation-driven economies. Results indicated that students require activities which provide them the chance to create networks with each other and sessions which are for active trainings than the traditional lectures and seminars. Further it was found that active participation for entrepreneurial education is a key method to enhance the entrepreneurial intentions.

Capiene and Ragauskaitė (2017) investigated the students' attitude for entrepreneurship can be enhanced through opportunities, sources of information, motivational factors and abilities for entrepreneurship. They found that the development of the collaborations of stakeholders in entrepreneurship education is essential to minimize the distance between teaching methods and attitudes of the students. On the other hand, Saeed, Muffatto and Yousafzai (2014) highlighted that positive influences can be generated through practical engagement of entrepreneurial activities in entrepreneurial education. This study is based on 805 Pakistani university students.

The key concerns of the above literature can be combined into one unified whole that can drive entrepreneurial orientation of an organization in light of McKinsey 7s Model. The 7 S model proposes seven elements of an organization, which are critical in implementing organizational strategy. As he indicated the model consists with structure, Strategy, Skills, Staff, Style,

Systems, and Shared values. Hence, it is useful tool to analyse the internal elements that can be attributed to implementation of an entrepreneurial eco-system from an organizational strategy perspective. It is identified that shared values, skills, staff and style are the software of the organization. On the other hand, strategy, structure and systems are the hardware of the organization. According to Kanhaiya (2013), these seven internal elements form a hexagon relating with each other and shared values are at the centre of the wheel and can be treated as organizational culture. Further, the styles can be attributed to the leadership of the organization. Hence, it can be argued that this 7 S model can be used as lenses to capture how entrepreneurial initiatives are adapted and employed in an eco-system. With this intention, the present study deploys it as a Value-Based Model to study the intrapreneurship in the university and how it constituted a conducive atmosphere. Accordingly, this can be an ideal tool to explain entrepreneurial culture of the university (Kanhaiya, 2013).

Entrepreneurial Initiatives of ABC University

To gain insights about success factors of an entrepreneurial university it is important to delve into the past and study the evolvement of the university to the present. ABC University administrators first identified the significance of entrepreneurial knowledge development aspect earlier than attitude and skills component of entrepreneurship. Hence, ABC University established the “Department of Management of Technology” under Faculty of Engineering to deliver management and business-related modules to Engineering Graduates in 1998. The main objective of this department was to enhance the business and management knowledge of technical undergraduates, so when they step in to corporate world, they possess necessary multi-disciplinary knowledge to become successful corporate leaders. Entrepreneurship or self-employment was not a major concern. Gradually, the Department of Management of Technology expanded to serve other faculties also and then in 2017 the university established the Faculty of Business. Faculty of Business was created with the idea to leverage the strength in technology discipline and inculcate business environment within university. The business faculty was not to function in isolation, but to support all faculties develop with business sense.

ABC University pioneered in entrepreneurship education as it created “Endowed Professor in Entrepreneurship” with funding from NDB Bank of Sri Lanka. The position was set up to support entrepreneurial research and to develop a minor degree in Entrepreneurship for the BSc Engineering degree.

This minor degree was first supported and delivered by YESL (Young Entrepreneurs of Sri Lanka) (an NGO focused on promoting entrepreneurship at young age). The main argument was that if it was taught by existing academic staff in a traditional manner, then it would not be effective. But the rapport between the department and YESL deteriorated with time and Department of Management of Technology decided to offer the minor by using its staff.

In 2015, ABC University incepted “The Enterprise” which is a new centre with the main objective of fostering innovation and entrepreneurial culture among the university and stakeholders. Being a tech-savvy university, commercialization of technologies, promoting entrepreneurship and establishing business incubation model for innovative products to strengthen the start-up community were among the main tasks of “The Enterprise”. In 2015a leading private sector company named Institute of Financial Services (IFS) signed a milestone agreement with ABC University to establishment the unique position of “IFS Chair in Innovation and Entrepreneurship” where funds were received as part of CSR activities of IFS. The IFS Chair functions under “The Enterprise” in hierarchy. Turning the university’s rich legacy to a culture of entrepreneurship, “New Ventures”, incubation and acceleration programme managed by IFS Chair in Innovation and Entrepreneurship’ incepted in 2017.

Table 01 shows the students who have passed out with the Minor degree in Entrepreneurship at ABC University during last four years. This implies that though a considerable level of enrolment is in each year, nearly 40% of the students registered for entrepreneurship minor are able to complete the Minor degree. However, compared to 2016 graduates, 2017 and 2018 show a positive difference and nearly a 70% increase of grandaunts with Minor in Entrepreneurship degree.

Table 1: Number of students passed out with Minor degree

Department	2018	2017	2016	2015
Electrical Engineering	6	3	5	10
Civil Engineering	5	4	5	3
Biomedical Engineering	2			
Electronics & Telecommunication	3	1		7
Chemical & Process Engineering	6	11	1	1
Textile & Clothing Technology	1			
Mechanical Engineering		4	2	5
Materials Science and Engineering		1		
Earth resources			1	

Total	23	24	14	26
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However, compared with the composition of students of ABC University, there is a clear enthusiasm among female students to participate in entrepreneurship activities. This is a significant achievement as women entrepreneurship has become more and more important (Coleman, 2004; Afrin, 1999; Caputo & Dolinsky, 1999).

Methodology

The study design was qualitative in nature (Bryman & Bell, 2011). For the qualitative in-depth interviews, a purposive sample was selected covering the key stakeholders of the university who had a role played for last three to five years in promoting entrepreneurship culture in the university. This included IFS endowed Chair, Director-Enterprise, a student director of a successful New Venture Start-Up and the Vice Chancellor of the university. A discussion guide was prepared for each interview covering their past experiences, challenges, motivations as well as insights with reference to their role played in entrepreneurship initiatives. In analyzing interview data, the thematic narrative analysis was employed. This approach aims on the “what” of the stories rather than the structure, and identify common elements in order to conceptualize emerging themes (Riessman, 2007). The interviews were tape-recorded and later transcribed into memos. Transcriptions were analyzed manually based on narratives and identified the key categories and then combined these into important themes. In this process, McKinsey 7s Model was deployed as a basic framework to identify and interpret the importance of the key elements highlighted in the interview transcriptions.

Findings and Discussion

Interview with the International Financial Services Chair of ABC University

ABC University took several failed attempts to promote entrepreneurship within university. An NDB endowed Professor was appointed in 2010 where the position was held by two senior academics. Both had business start-up backgrounds where one of them was leading international assignments of his business in electricity generation. Then as J. became the VC, he invited the

Young Entrepreneur of Sri Lanka (YESL) to engage in the preparation of entrepreneurship minor program. The team from YESL, although willing, could not make a substantial impact as they were outsiders to university culture and did not have experience in handling university students. Their delivery strategy, though could be effective for teenagers, did not materialize as university students require independence and freedom of thinking. Hence early initiatives did not make a significant impact to the entrepreneurial culture of the university. Mr. H stated:

“The IFS chair position itself is a (system) innovation. Previous position holders were working as academics that did not have the open mindset to embrace entrepreneurship and identify unique needs of entrepreneurship education. Also (they) did not take the ownership of this program. A dedicated person is required for this task”

Due to the lack of accomplishment in initiatives, J. met and persuaded higher management of IFS in discussions to contribute to the entrepreneurship drive as university funding was not sufficient to do an entrepreneurship program. IFS, being a leading employer of ABC University undergraduates seems considered this as: Firstly, an opportunity to create corporate identity among their future labour market and secondly as an innovation driven CSR where they could prove to be a true corporate citizen. New Ventures had 3 versions as 1.0, 2.0 and 3.0 each with a gradually developed emphasis and a vision. It was started in February 2017 and Prof J. and Mr. H had planned the outcome. Mr. H stated:

“New Ventures is an experiment. We understood that winning a competition won’t create entrepreneurship drive. What we needed was a continuous effort from all parties. In New ventures 1.0, we only focused on ideation stage and limited the initiative to undergraduates of ABC University. We did not require innovative ideas. Just a business interest! That’s all.”

Contrary to the expected, 20 applications of 48 applications were from females. Compared to the statistics that 90% of undergraduate population of ABC University are males, this was a tremendous achievement which showed that female techno-entrepreneurship is possible and taking place. The applicants had to go through mini-pitches and ten applicants were selected to the last phase. A prize was given to the winner and was released stepwise monitoring the progress. The momentum and climate of this New Venture 1.0 was

sustained during the pause between 1.0 and 2.0 with open discussion, workshops, guest talks etc.

“In 2.0, we focused on rapid prototype development. We also expanded the scope of the initiative by opening to the outside but outside students needed to partner with at least one inside student. Collaboration and diversity were the key.”

The teams who participated in 1.0 were also invited to participate in 2.0, but some teams changed their initial ideas and re-enter with a different business plan. As the entrepreneurial spirit was in air after 1.0, a team with members from diversified fields (marketing undergraduate from outside the university and a person without a degree qualification). This diversity in educational levels and fields were highlighted as a success point by the winning team. VC of ABC University, J. allowed outside students to participate in inside workshops and lectures on entrepreneurship and this was debatable and it's the leadership of J. which facilitated this initiative by managing resistance.

“In 3.0, we relaxed restrictions to a great extent. It was open to all parties irrespective of university students or not and internal or external. We received two applications from schools also and two application from international level (Nepal and Morocco). I used social media extensively. Finally, the New Ventures 3.0 was won by the team from Nepal.”

Looking at background of Mr. H, he is an electronic engineering graduate of ABC University and he completed the MBA in Management of Technology from the same university. Clearly, ABC University being his alma mater, he had that internal desire to serve ABC University. He also had a balanced education (technology stream in undergraduate and management stream in postgraduate) which enabled him to identify potential businesses both in terms of innovative aspects and business aspect. Mr. H recalls:

“During undergraduate time, I always thought differently. I had applied as an intern in a UK start-up during undergraduate time. I had my internship in a UK start-up where I learned the hardships of small businesses, the supportive culture of employees, resolute commitment, attention to detail and I developed the attraction towards start-ups. I witnessed how the production manager (the son of the owner) sweeps the floor and owner working till midnight. When my

friends came back to university, most of them had informally secured jobs in large telecommunication and electronic companies in Sri Lanka whereas I was dreaming of starting my own business”

Although he joined the largest telecommunication provider as the R&D engineer, he had this entrepreneurial mind-set. He had commercialization experience during employment and created entrepreneurial spirit within the large organization. He travelled to many countries and had commercialization experience and developed networks which he exploited in his role as IFS chair. For example, when Nepal team won the 3.0 competition, he used his networks developed during employment to help them to secure a business partner. Later, at the peak of his career, he gave up the employment and started his own company which he was managing very successfully by the time he joined as the IFS chair.

Mr. H made the concluding remarks:

“It was the experience as an entrepreneur, my internship and my commercialization experience at D which mainly made me successful in my role. The networks I developed played a significance role. This kind of role cannot be played if you confine to university premises. You need to go out, talk with industry, and create linkages. Imitations are taking place in other universities in Sri Lanka but unless you tackle two main aspects, I believe it will fail. Firstly, the role must be given to a dedicated open-minded person without academic work and bureaucracy. Secondly the university must develop the entrepreneurial culture and climate first. The students must ask for it and it should be a bottom-up approach. At ABC University, the entrepreneurship society took the lead. In another university, it could be another mechanism. You must find out a way before you start university wide entrepreneurship initiative.”

It is clear that entrepreneurship program at ABC University was successful mainly due to few aspects. Firstly, intellectual simulation related to entrepreneurship not confining to outdated methods and secondly it was facilitating it through inspirational motivation.

Interview with the Director, Enterprise

Mr S., the current Director, Enterprise took office in 2015 as the first Director and the activities had been centrally coordinated from then. Mr. S is a Senior Lecturer from Department of Mechanical Engineering and he held several high rank positions in the public sector. He is known for his rigorous reforms which he carried out in these organizations. The Enterprise is governed by a Senate appointed steering committee and it has two main arms. Innovation, entrepreneurship and incubation activities arm was mainly looked after by Mr. H as the Chair, IFS. University-Business Linkage Cell, which focused on Technology Transfer, Technology Information and IP and Licencing was the other arm of Enterprise.

Ceptureanu (2000) proposed key implications for performers involved in improving entrepreneurial engagement at universities. Differences between universities organizational structures regarding organizational norms should be considered when encouraging entrepreneurial engagement. Then, all ranks of the university hierarchy need to be addressed when support system for entrepreneurship is developed. Structural changes are required for traditional universities to initiate entrepreneurship programs. “The Enterprise” created this structural change where similar and related activities are centrally coordinated so that it will achieve synergy.

“When it comes to entrepreneurship, being a technical university and industry working close with university, we had the edge. The students were conversant with industry problems, trends and issues. All that was needed was the business and innovative mind-set to capture the opportunities. Even the final year projects were related to the industry”

When J. visited National University of Singapore (NUS), he was inspired by the model they had, which is similar to Enterprise. As per Mr. S, the academic staffs were not supportive at the commencement. Since most industry linkages were maintained at individual or department level, there was a fear of losing control of it. Hence, at the beginning, Enterprise allowed department level linkages but collected information about those activities.

“We had failures probably more than successes at the early stages. We tried to teach entrepreneurship as a subject in pre-academic term but failed. Even the staff priorities were different. Firstly, they perceived that promoting

entrepreneurship could have a negative effect on careers of engineering graduates. In a technical field, they believed that industry and practical experience in early stage of career is preferred and advantageous. Entrepreneurship could digress students from their main course which is a rigorous technical education not business.”

Mr. S. is adamant that entrepreneurship can never be developed in public universities unless the desire and motivation are ignited from the student side. Universities must first attempt to develop soft aspects rather than formalizing the programs. Creation of a conducive climate, guest talks with business leaders, inauguration addresses by business leaders, competitions, societies, and open days are some activities which can be used effectively to create the entrepreneurial culture. Organizational structural changes and including the entrepreneurship in academic curriculum should come later. The formal initiatives will only success only if the right climate has been created. Otherwise it will fail. It will also take a longer time and will create more resistance from internal academic staff. In most entrepreneurship courses, students are exposed to a set of very sequential and functional based modules and approaches leaving no room for values, creativity, emotions and the ethical component of being an entrepreneur (OECD, 2010).

Piperopoulos (2012) studied the relationship between entrepreneurial intentions of students and the time of stay (duration) at university. He noted that entrepreneurial aspirations go down and motivation of the students weakens at later years of the academic course as students are more focused on exams and securing jobs to satisfy social expectations. The rigid organizational structure and laws of public universities forbid the commercialisation of knowledge and technology transfers or spin-offs. All stakeholders of the university including faculty members and industry as well as students must be clear about what is entrepreneurship with in the university and the final outcome expected from promoting that.

Interview with an Owner of a New Venture Start-up

In order to get insights of an owner of a New Venture Start-up, a graduate of ABC University who participated in NewVentures1.0 and 2.0 was selected. He currently owns a start-up which runs a mobile application related to transport (Similar to Uber). He has about 2000 drivers registered in his mobile application and a remarkable growth in income and employee base for two years. Mr D. explained his motivations:

“My parents never liked me to become an entrepreneur. They were public sector employees but my father ran a small business of his own. I also had no intention when I joined University. But, when I was in second year, a request from my classmate came to me to develop an underwater polo facility to my school (i.e. underwater sports facility). I and few of my friends did it and it was a success. Since many advised us to patent this, we presented it to the IP rights committee of university and they said that they do not intend to keep any IP rights as university resources are not used for this course. Neither had they helped us to get IP rights”

Although, their product was not given the IP support from university, the team heard about the first New Ventures competition from their peers. They decided to present it to the competition and their team won the runner-up position. But they were busy with their academic work and team was not able to do any business with the aforementioned innovation. At New Ventures 2.0, they re-entered with a novel idea and a product: a sports software. They were the winners and found a very helpful mentor in the judge panel, who supported them in their initiatives at a later stage. A company was registered and then came the third business idea which ultimately created a start-up.

“I was tired. We won competitions but we never made a significant business presence. We were about to find employment when my team member talked to me about an opportunity in the mobile apps for transport. We did a market research with about 600 drivers [what we learned in management modules helped us] and realized the potential. Finally, we decided to try it to our best ability and it was successful”

Journey as an entrepreneur was not a bed of roses. There were several incidences that the salaries of the employees of his organization could not be paid on time. Management modules offered as part of his engineering curriculum helped him to get that business intuition, knowledge and sense. HRM and accounting were the most important while marketing module was also helpful. Mr. D concluded that entrepreneurial culture at ABC was really conducive in achieving his passion.

Interview with the Vice-Chancellor of the university

The entrepreneurship promotion activities at ABC University clearly took a remarkable turn after J became the Vice-Chancellor in 2012. This can be clearly

seen when comparing the number of start-ups recorded before his time and during his time. 51 start-ups were recorded with 8 more in prototype stage and 23 in ideation stage in three years from 2016 to 2018.

J. is a civil engineer attached to Department of Civil Engineering and completed his PhD from a leading UK university in the field of construction management.

“I believe that university is the best place to start entrepreneurship because they have value added professionals with background knowledge. As an academic I was always interested in activities that improve academic quality, raise the bar and ranking of our university even as a junior lecturer in Department of Civil Engineering. I was a strong promoter of Uni-industry collaboration whereas many senior academics advised me that industry should always listen to us and we are above them. Amid the resistance, it was my initiation which led to start of Department-Industry Consultative Board (DICB), a platform for industry, other stakeholders and department t academics can exchange ideas and plan the future.”

Although he played a major role in promotion of university-industry linkage, until 1997, he did not get the chance to engage in promotion of management modules at ABC University. He reached for help from foreign universities as the field was totally new to Sri Lankan university system. One expatriate academic attached to Queensland University of Australia, after seen the request from J. offered to support. J. was invited to audit and develop the courses similar to what was offered in Australia and as a result they introduced modules such as Industrial Economics and Management and Technology Management. Further after few years, an ADB grant was offered for J. to visit Asian Institute of Technology (AIT), Thailand to audit their MBA in Management of Technology course. After returning, J. introduced the MBA in MOT program at ABC University.

“Gradually, management modules were introduced to engineering curriculum. However, little focus was on innovation, SMEs and entrepreneurship. When I was the Dean, Faculty of Engineering, I had an invitation from Toyohashi University of Technology, Japan to come and observe their initiatives. I followed up and managed to convince a Senior Lecturer of Mechanical Engineering to spend his sabbatical leave there. He studied their seed funding programs, incubators, SME centre, IP policies etc. and came back with many

novel ideas. Little after, I was listening to a convocation address by the then Dean, Faculty of Engineering of University of Calgary, Canada who was also an expatriate from Sri Lanka where he mentioned about “becoming job creators than job seekers” and this motto immediately appealed to me. That was the beginning of contemplating a strategy for entrepreneurship”

Having understood the need and importance of entrepreneurship promotion at ABC University, J had to institutionalize and prioritize the concept. As per Bergmann et al. (2018), for the general student population, including entrepreneurship content in their normal studies seems to be required to initiate a social process of sense making. As per Sam and Sijde (2014) entrepreneurial university is not merely a university executing the mission in promoting entrepreneurship, but it also incorporates it into teaching and research to maintain its academic identity. The above initiative of J. fits well with these outcomes.

During this time period, J. was appointed as the chair of the committee to prepare the strategic plan of the university. He exploited this opportunity and incorporated entrepreneurship and innovation plans in the ten-year corporate plan. He understood that a committed person is required to implement these plans and he approached one of the leading banks in Sri Lanka, NDB and explained the plan to them. The Bank agreed to fund the “NDB endowed professor of entrepreneurship” position for three years.

“We advertised for this position thrice, but a suitable applicant did not apply. We wanted a person with balanced qualification and pragmatic person with good education background. When I retired after deanship, NDB asked me to take over as it was my idea to have this endowed professorship”

As the endowed professor of entrepreneurship, he received the support of YESL to have some events such as pitching events and a ceremonial start-up launch. While the climate was slowly becoming conducive, J. sought to include entrepreneurship into formal education through introduction of minor in entrepreneurship. Amid resistance from other academics, it was approved by Senate. Some departments first did not embrace this but later they also opened this option to their students as well.

“After three years, NDB was not keen on supporting as the progress was not convincing to them. As the new VC, I reached IFS and discussed with them the possibility to continue funding. We agreed to add innovation aspects also and that is how IFS chair for innovation and entrepreneurship came into a reality. This time also we called applications three times before we met Mr. H who fitted well with our expectations”

Bikse, Lusena-Ezera, Rivza and Volkova (2016) investigated how traditional higher education entities are turned to entrepreneurial universities in Latvia. It confirmed that undergraduates or those who follow courses need to be supported in building social capital and strengthening knowledge co-creation with external stakeholders. J had been able to do this strategically. As the VC he visited National University of Singapore (NUS) and picked up the idea of “The Enterprise”. He tailor made the idea to suit the local university context. He was able to share his vision by slowly inculcating these ideas to the academic, non-academic and students and with every address he reminded this direction. He concluded:

“As the VC, I changed many by-laws, IP regulations, obtained council approval for incubator, changed the structure and so much more to support the entrepreneurship promotion at ABC University. You really cannot by force academic community into change. If there is resistance you need to find out why and address them. It is a journey that we went with them and against them. If you have a vision you need to fight for it and I did it in a persuasive way not a confrontation.”

Research leadership in public universities is lengthy discussed in Mønsted and Hansson (2010). To become a pioneer in research, public universities need to balance the managerial control and openness. Generation of new resources are more effectively done when universities are open to other knowledge organizations and external networks. Creative entrepreneurial strategies and activities produce new knowledge centres. It is stated that complex links to other managerial systems in the universities can be decisive. As Eyal & Kark (2004) critically analysed, transformational leadership could develop a cohesive entrepreneurship strategy that facilitates radical change. The case study of ABC University and the leadership qualities of VC further supports these research findings.

The implemented procedures can be related to the key aspects of 7S model. This is shown in Table 2 as a summary on how initiatives are related to the specific element of 7S model. Not only the links but also the order is important in 7S model. 7S elements are arranged in a hierarchal order although there could be overlaps. This is shown in figure-01. The hierarchy is prepared in the order that the values/perceptions flow. Shared values, leadership and strategy direct and mould structure, systems, staff and skills of the organization.

Table 2: 7S Elements in Implementing an Entrepreneurial Eco-System in a Technical University

Element	Initiatives linked to the element
Strategy	<ul style="list-style-type: none"> <li data-bbox="458 643 1151 719">• Innovation and entrepreneurship were related to formal corporate strategy Including Entrepreneurship and Innovation in formal corporate strategy of university was a key initiative that VC initiated in 2010. As per the discussion section “...exploited this opportunity (i.e. including him as resource person in strategic committee) and incorporated entrepreneurship and innovation plans in the ten-year corporate plan”. <li data-bbox="458 1016 1151 1228">• Action based, student centered programs Realizing that inclusion of entrepreneurship in curriculum and academic activities will not spark the initial interest of the students, entrepreneurship drive mainly took an action-based approach that came from student side. <li data-bbox="458 1249 1151 1555">• Institutionalizing at a slower pace to sustain the entrepreneurship environment As the VC of ABC university highlighted “It is a journey that we went with them (i.e academic and non-academic staff) and not against them”. First most of the activities of the entrepreneurship drive were optional and carried through Entrepreneurship Society to reduce resistance and improve effectiveness. <li data-bbox="458 1576 1151 1646">• Use of ABC University brand image as a leading technical university and its industry linkages to support

entrepreneurship

As J. stated “I was a strong promoter of Uni-industry collaboration where as many senior academics advised me that industry should always listen to us and we are above them. Amid the resistance, it was my initiation which led to start of Department-Industry Consultative Board (DICB), a platform for industry.” As the VC he used the industry relationships and the ABC brand name to attract funds (e.g NDB, IFS) in formulating entrepreneurship promotion strategy.

Systems

- **Borrowing successful ideas/systems employed by foreign universities such as NUS (Singapore), Toyohashi University (Japan), AIT (Thailand) and adopting it to suit local context**
- **NDB Chair of entrepreneurship and The Enterprise and IFS chair for innovation and entrepreneurship were new innovative organizational systems**

Having an external party funding (NDB) and external party conducting a course (YESL) itself was a system innovation which had not taken place in ABC up to that moment.

- **External parties were engaged in providing funds and in all possible occasions related to entrepreneurship activities**
- **Developing supportive IP regulations and by-laws**

As J. mentioned in the discussion “As the VC, I changed many by-laws, IP regulations, obtained council approval for incubator, changed the structure and so much more to support the entrepreneurship promotion”.

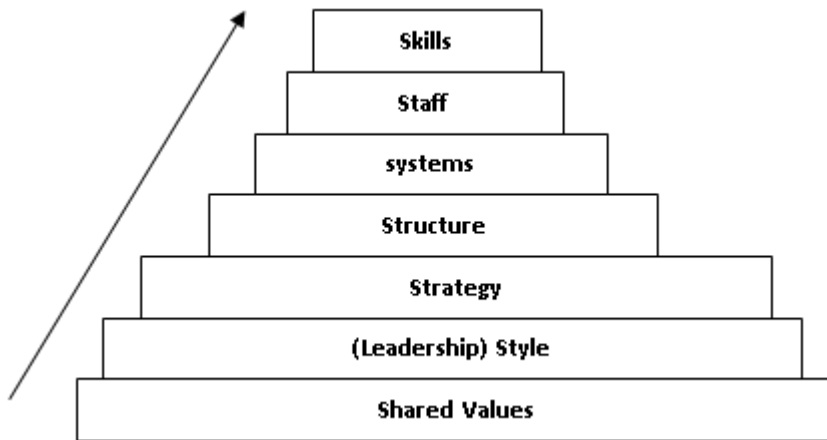
- **Promotion and tools assessment of university employees were related to key success indicators of entrepreneurship program**

As J. mentioned, in promotion interviews and selection interviews, the candidates were asked several questions related to their

	<p>knowledge, contribution and motivation towards entrepreneurship to identify potential key players and reward those who already contributed.</p>
Skills	<ul style="list-style-type: none">• Entrepreneurial skills of university students were developed through both informal and formal activities• Social capital of university, support of SL born foreign academics and university linkages with industry
Shared Values	<ul style="list-style-type: none">• Perception of academic staff was gradually altered and changed to suit the new entrepreneurial environment <p>As Director, Enterprise mentioned “Even the staff priorities were different. Firstly, they perceived that promoting entrepreneurship could have a negative effect on careers of engineering graduates. In a technical field, they believed that industry experience in early stage of career is preferred and advantageous”. The key players worked hard to overcome these negative mindsets and develop a shared value system.</p> <ul style="list-style-type: none">• Leadership with a vision towards entrepreneurship• Entrepreneurship was instilled and promoted in all key occasions’ inauguration addresses, award ceremonies• Following the motto “job creators not job seekers” and propagating for it <p>J. mentioned that “I was listening to a convocation address by the then Dean, Faculty of Engineering of University of Calgary, Canada who was also an expatriate from Sri Lanka where he mentioned about “becoming job creators than job seekers” and this motto immediately appealed to me”. He echoed this statement in all official functions thus instilling the need to adjust the value system to include entrepreneurship aspects.</p>
Staff	<ul style="list-style-type: none">• Careful recruitment for Chair positions <p>The recruitment policy broke through the traditional methods of recruitment where the main qualification was academic achievements. The ABC university waited until right candidate is</p>

	<p>present although it took a long time to fill the vacancy. As J. stated, “We advertised for this position thrice, but a suitable applicant did not apply.”</p> <ul style="list-style-type: none">• Entrepreneurship society was a key integration/communication point between staff and students
Style	<ul style="list-style-type: none">• Transformational leadership style in introducing programs related to entrepreneurship• Inspirational motivation displayed by VC and IFS chair
Structure	<ul style="list-style-type: none">• Bureaucratic procedures and structural changes were initiated by introducing advisory board that communicated directly to VC <p>IFS chair and Director Enterprise had a formal organizational channel which directly reported to VC which helped them to maintain a rapport with VC as well as identify their needs and resource requirements easily.</p> <ul style="list-style-type: none">• Simple IP claim procedure was introduced and removal of red tapes and bottlenecks in IP claim procedure which took more time and effort• Centralized structure for innovation, incubation, consultancy, entrepreneurship, IP which facilitated coordination

Figure 1: Hierarchy of 7S Elements in implanting an Entrepreneurship Eco-System



Conclusion, Implications and Further Research

The findings of the study reconfirm the importance of entrepreneurial culture in promoting entrepreneurial education in a technology dominant university in Sri Lanka regardless of the context. It concluded an entrepreneurial eco-system in a high education system can be made active through fine-tuning the four software elements, namely shared values, leadership style, staff & skills, and the three hardware elements, namely, strategy, structure & systems as per the McKinsey 7s Model. Therefore, the findings can be validated from a business strategy making perspective that organizational culture, transformational leadership and strategy are the key elements and in turn which drive institutional structure, systems staff and skills in realizing entrepreneurship and venture creation potential in a technology dominant higher education institution. It is also clear that by facilitating innovation/entrepreneurship ABC University not only enhanced the reputation but also the reputation of their university community (students, academics/scientists).

Therefore, the present study contributes to the existing body of knowledge on how to implant and sustain entrepreneurship culture within a highly bureaucratic and non-business organizational context. It provides evidence on a case as to how change management can be introduced in order to bring about positive gains to the stakeholders in a higher education system by manipulating internal organizational culture, where resistance to change is inevitable. In

understanding of this phenomenon, it was unique to find through the thematic narrative analysis, that the seven S elements of McKinsey 7s Model can be ordered and arranged hierarchically in a sequential order in successful implementation of the concept of entrepreneurial eco-system in a technological higher education institute. As presented in the above analysis, it was discovered that instilling of shared values on entrepreneurship and new ventures creation is the cornerstone of the hierarchy, in turn it facilitates the transformational leadership style and strategic intent of the academic administration to adopt and drive entrepreneurially valuable initiatives across teaching, learning and assessments with introducing right structural elements and systems, recruiting competent staff to generate relevant skills. This theoretically implies that organizational culture and transformational leadership have more of an abstract but a significant influence on strategy development and implementation in public sector resource constraint higher educational institutes in Sri Lanka. This again emphasizes the role of intangible assets in public sector entrepreneurship development as supported by the Resources Based View of the firm (RBV).

Further, from practitioners' perspective, these findings shed light on some key organizational decisions in implementation of an effective entrepreneurial eco-system in a technology based university. For educational policy makers, it emphasizes the necessity of an entrepreneurial and innovation strategy where the involvement of universities as agent of the entrepreneurial/innovation ecosystem of the country will be recognized/legitimized. It needs enhancing transformational leadership in an academic leadership. This can be exercised by incorporating qualities of intellectual stimulation, inspirational motivation, charismatic leadership by means of academic leadership skills training and development. Furthermore, it proposes higher education institutes to employ more engagement/collaboration-oriented teaching, learning and assessment strategies, where various stakeholders (students, industry, scientists et.) can interact and meet business needs with technology know-how in order to create value. This can be made possible through linking entrepreneurship and venture creation exercises with multidisciplinary and design thinking projects in the emerging Outcome Based Education (OBE) philosophy.

The study can suffer from some limitations as the study was based only on one technological university in Sri Lanka and the only the qualitative interviews were employed as the data collection method limiting the respondents to a few key stakeholders. Hence, the findings cannot be representative of the other public sector universities in Sri Lanka which might not be technology dominant.

It is possible to undertake future studies in the same area by taking several universities representing of both technology and non-technology profiles in the public sector universities in Sri Lanka. Future studies can also employ mix methods covering both qualitative and large quantitative sample survey methods in order to explore and compare drivers of the entrepreneurial orientation as well as make some generalizations about the entrepreneurial eco-systems of Sri Lankan public sector universities.

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