

Higher Education and IR 4.0: Embedding Entrepreneurship Education in Malaysian and Nigerian Universities— Developments and Challenges

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ABSTRACT

Purpose: This paper identify major objectives as yardsticks to juxtapose our arguments throughout the study, examining the implications of IR 4.0 for higher education and entrepreneurship education by reviewing Nigeria's and Malaysia's national development plans to determine their relevance to IR 4.0.

Design/methodology/approach: In view of the complexities generated by the Fourth Industrial Revolution (IR 4.0), which affects every sector including entrepreneurship and education, this study undertakes a systematic literature review to ascertain the facts and discuss concepts related to higher education and entrepreneurship, particularly the role of IR 4.0 in changing and modifying the direction of entrepreneurship.

Findings: The study also highlights the approaches adopted and challenges encountered by universities in their implementation of entrepreneurship education, considering the job market disparities mentioned earlier. The paper conclude that it is imperative for both countries to instill the virtues of entrepreneurship education in their students, in order to prepare them for the challenges and needs of IR 4.0.

Research limitations/implications: This problem is largely associated with the weak approach adopted by universities in equipping students with the necessary entrepreneurial skills for today's highly competitive industrialized era, and not in any way related to the students themselves.

Practical implications: Thousands of students graduate every year from Malaysia and Nigerian universities and other higher institutions across the globe. However, the availability of job vacancies in government and other sectors is insufficient to match the number of graduates produced annually.

Originality/value: This paper is original

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I. INTRODUCTION

Today's environment is inevitably characterized by disruptions arising from technological advances. The Fourth Industrial Revolution, also referred to as IR 4.0, is bringing many changes in jobs, lifestyles, and even education. The World Economic Forum has suggested that about 65% of the children currently in primary school education may end up working in jobs that do not yet exist (Nazir, 2019). Untapped talent exists across the workforce, and an urgent response is needed to allow countries such as Malaysia to create, adapt, and integrate distinctive technological solutions in the transformation of their workforce and industries (Nazir, 2019). Arising from the changes brought by disruptive technologies, employees need to acquire new capabilities such as problem-solving skills, creative thinking, and communication skills in addition to technological skills (Passow & Passow, 2017).

However, researchers have suggested that students are not taught these skills in universities. This includes gaps in the teaching of skills related to entrepreneurship; indeed, it has been pointed out that entrepreneurship

skills in particular should be given additional attention (Duval-Couetil, 2013). Fayolle (2013) notes that there is a particular need for strong intellectual and conceptual foundations in relation to these skills.

Higher education has relevance for the development of any nation, with the economic condition of any state being significantly determined by the caliber of its universities. As with other fields such as law, health, security, and ethics and morality, a nation's economic development rests heavily on the quality of its higher education, especially in terms of the amount of economic manpower, research, development, and technology transfer that stems from higher education (Jackson, 2007). Higher education is a significant engine for national development, but policymakers and other stakeholders in entrepreneurship are also powerhouses in driving a country forward (Addo, 2010).

National development plans are the foundations upon which all development activities are built, and the more relevant educational policies are and the closer they adhere to national programs, the more vibrant and rewarding higher education can be. It is up to policymakers and responsible supervisors to ensure the success of any implemented policies or programs. Even when they are periodically reviewed and improved, national development plans can only yield the desired results when the laid-down rules and regulations, as well as all provisions, are implemented as planned (Chimhowu et al. 2019).

One of the growing areas of interest among higher education institutions and educators is entrepreneurship education, which is intended to contribute to the development of students' entrepreneurial intentions (Küttim et al. 2014). Entrepreneurship is one of the sectors that can accelerate the growth of national economies, and in many countries it allows more job creation and offers more job opportunities than any other sector, either private or governmental (Bank, 2015; Momani, 2017). Entrepreneurship comes in different shapes and sizes, in the form of small-scale, medium, or even large-scale business enterprises depending on how the skills, money, and equipment invested as well as the risks taken in running the business. Young graduates can immediately be employed by the entrepreneurial sector or may engage in their own start-up entrepreneurship, which saves them from waiting for scarce white-collar jobs to become available. Often the initial pay may be negligible, which may be attributed to the diversity of entrepreneurship in terms of the nature of work and the level of skills required. The higher the level of skills applied, the more likely it is for a start-up business to be sustained in the long run and to create more job opportunities from within and beyond. Businesses of this nature must be receptive to new innovations, bold, and resilient to challenges and risks (Ciešlik, 2014).

Therefore, universities should provide entrepreneurship education in order to equip students with the necessary competencies to develop their entrepreneurial inclinations and increase their competitiveness (Duval-Couetil, 2013; Maloney, 2017). The development of entrepreneurship skills to enable students to perform successfully should be the primary objective of entrepreneurship education (Elmuti et al., 2015; Nabi et al., 2017). As stressed by Carolis et al. (2019) educators should teach the entrepreneurial mindset and process, thereby preparing students to be successful in their future entrepreneurial endeavors. The main focuses and objectives of entrepreneurship education in higher education should be to provide graduates with skills that will enable them to sustain themselves through self-employment or through paid employment in the private or public sectors, and above all to be job creators rather than mere job seekers (Fretschner & Weber, 2013). Researchers and scholars have suggested several ideas to accomplish these objectives, with design thinking seen as a pedagogy that may be appropriate in entrepreneurship education (Lynch et al. 2021).

The Fourth Industrial Revolution (IR 4.0) refers to new technological advancements wherein the lines between the physical, digital, and biological worlds have become blurred (Schwab, 2017). IR 4.0 has literally affected all sectors of human life, including societies, education, economies, health, communication, production and so on. There is an inseparable relationship between IR 4.0 and entrepreneurship, whereby the latter can only be improved and sustained by properly harnessing it with the former. However, most of the technological developments witnessed during the last century were geared toward facilitating production and communication, as well as improving the level and quality of service delivery. IR4.0 has brought a greater need to align people and technology to new possibilities; as explained by Fisk (2017), the new vision of learning needs to identify and learn new skills and knowledge.

(Dunwill, 2016) stated that teaching methods and processes must transform and change due to the advance of technology. Educators and institutions of higher learning must embrace changes and adopt new software and applications, which means that entrepreneurship and technology must work in tandem, regardless of the size of the company's production. For this reason, it is necessary for education, especially higher education institutions, to produce useful and relevant graduates who will be able to fulfil the need for technological and entrepreneurial skills. Otherwise, there will be increasing numbers of vacancies that cannot be filled by fresh graduates coming from universities (Rigg, 2018).

Because of the interwoven relationships between entrepreneurship and technological development on the one hand and higher education on the other, this paper will carry out a systematic literature review of the existing academic work related to how universities in the Asian Pacific Region and Africa are approaching entrepreneurship education in order to keep pace with IR 4.0.

A. Background to the two contexts

Entrepreneurship education was introduced in Nigerian tertiary education in 2006 as a possible solution to the problem of unemployment among Nigerian youth, especially those coming out of higher institutions of learning where they would be equipped with the required knowledge, skills, and encouragement to embark on an entrepreneurial career. It was expected to divert graduates' attention from seeking white-collar jobs to self-employment, in an effort to convert them into graduate job creators, rather than job seekers (Agbonlahor, 2016).

Entrepreneurship education (EE) is a system of education designed to equip learners with the skills and knowledge to start both small and medium businesses and prepare them to make serious economic decisions related to promoting and sustaining their entrepreneurship. In a nutshell, entrepreneurship education is an educational discipline that prepares students to become versatile, successful entrepreneurs who are able to make use of available innovations and technologies in order to survive and excel in competitive entrepreneurship (Anyebe, 2017; Nwosu & Ohia, 2019). Entrepreneurship education can also be seen as an educational field training young people to be enterprise-oriented, so that they eventually become conscious of entrepreneurial discipline. In addition, they will be capable of running an enterprising organization, making responsible decisions that determine the business's fate for profit or loss (Uwannah et al. 2018) (Kuryi, 2006) suggests that entrepreneurship education is any means that provides individuals and groups with chances to cultivate opportunities and resources and bring about positive innovation that will enhance the economy and boost the skills of individuals, groups, and even the government. Raimi & Gabadeen (2016) state that entrepreneurship education requires self-direction and self-management from the learner's side, because learning centers around what the learners have achieved, not what the teachers have delivered.

In Malaysia, Education 4.0 is aligned with IR 4.0, with the objective of using technological advancements to revamp the higher education system in Malaysia (Hajar Halili 2019). The government of Malaysia set a target for 5% of students to become entrepreneurs upon graduating in 2020 (Fisk, 2017) and the "Siswapreneur Showcase 2017" program was launched to create a framework whereby Malaysian students could become job creators and not job seekers. Malaysian students are encouraged to participate in entrepreneurial activities in their universities (Rahim et al. 2015) and the Entrepreneurship Development policy was introduced in 2010. As stated by Education (2010) this policy aims to enhance the effectiveness of graduate entrepreneurs by developing their entrepreneurial mindset. One of the most important solutions to the problem of the high unemployment rate among graduates is entrepreneurship education (Ariff et al. 2014).

Clearly there is a conspicuous need to harness higher education and entrepreneurship education in order to maximize the socio-economic development of a nation and create job opportunities and skills for its citizens. In addition, entrepreneurship adapts new technologies for production, and which in turn requires new skills for handling. It is the duty of higher education systems to prepare graduates with the skills (both technical and non-technical) that are required by trending entrepreneurs, and foster a willingness to try their hands in risk-taking ventures (Nabi et al., 2017; Naziev, 2017).

This review intends to examine the impact of entrepreneurship education on the entrepreneurial skills taught in universities, and the associated effects on graduate employability in the Nigerian and Malaysian entrepreneurial sectors. The paper also suggests ways to forestall the deteriorating approach to entrepreneurship education in the Nigerian and Malaysian higher education systems. In order to achieve this, the paper will select and critically appraise a number of academic works that are relevant to entrepreneurship, entrepreneurship education, higher education, and the national development plans in Nigeria and Malaysia. Hence, a systematic literature review process will be used as the research methodology.

II. METHODOLOGY

A. Higher Education and IR 4.0

An industrial revolution in any period or society is a time of scientific and intelligent advancement that causes widespread modification in the industrial, social, economic, and technological systems. Such periods are characterized by the facilitation of work, mass production, and improvements in lifestyle in general (Dombrowski & Wagner, 2014). Each of the previous industrial revolutions was associated with specific industrial developments—for example, introducing machinery to boost the production of manufactured goods, electricity and transportation, technology, and digital communication. The fourth industrial revolution (IR 4.0) is characterized by automation and the exchange of data in the field of factory technology. Building upon the last industrial revolution, IR 4.0 involves the internet, autonomous vehicles and robots, cloud computing, mobile computing, additive manufacturing, cyber-physical system, augmented reality, big data analytics, simulation, wearables, the internet of things, 3D printing, distributed ledger systems and other changes to communication, the delivery and sharing of ideas and information as well as instructions and feedback in cycles of man to

machine, machine to man, man to man, and machine to machine, achieving faster, more accurate, and cheaper production and services (Xu et al., 2018).

These changes brought by IR 4.0 necessitate concomitant changes and adjustments in higher education systems, specifically in terms of curricula, lecturers' capacity, and the objectives of universities. There is a patent threat posed by IR 4.0 to the essence of higher education, since the skills required by IR 4.0 are quickly outpacing the skills that graduates acquire from their universities (Sani, 2019). In the same way that IR 4.0 puts many workers with outdated skills out of work, so it is diminishing the benefits of higher education by reducing the employability of graduates with traditional skills. Many new graduates lack the information and communication technology skills required in the modern workforce.

It should also be noted that IR 4.0 penetrates into all disciplines, offering new perspectives, devices, and technology. Hence there is Education 4.0, Health 4.0, Manufacturing 4.0 and others. People are looking to higher education systems to train would-be workers in all these sectors and provide them with the required skills. To meet these challenges and serve society, higher education must embrace the developments brought by IR 4.0, creating learning environments and objectives that will fit the requirements of new technologies (Rigg, 2018).

B. The Implementation of Entrepreneurship in Nigeria

Historically, entrepreneurship has long been in existence among Nigerian communities as part of indigenous education. It stems back to pre-colonial time when families used to inherit the traditional businesses or skills of their families. These included butchery, blacksmithing, tailoring, dyeing, barbing, fishing, leathering, caravanning, and other undertakings. However, in the modern era many people have accepted entrepreneurship as the source of their livelihood, and have significantly profited from entrepreneurial activities.

However, in most cases entrepreneurship is seen as a substitute for Western education. This is to say, when a white-collar job cannot be obtained, a person might venture into entrepreneurship (Okoli et al. 2014). This assumption began to change as more and more graduates could not find employment, and were unable to find work experience in any sector. Their certificates became almost useless to them, because new skills that the students were not trained in were needed in the labor market, so their qualifications became irrelevant to potential employers.

In 2006 entrepreneurship was included among the courses offered by Nigerian universities, hoping that students' attention would be drawn to acquiring the skills needed for self-employment, a quick absorption into the labor market and less dependence on the government for employment. This education program has been implemented across the country, including in many private universities (Baba, 2013). However, from 2006 to 2016 entrepreneurship education grew only slowly; the government was quick to implement the education program but slow to provide manpower, infrastructural, and financial support. This could hardly be termed 'teething problems' since the issues continued for more than a decade. Whatever problems the Nigerian entrepreneurship education program now faces are direct results of the government's negligence and lack of support (Josephine Azuka Onyido & Doris Ijeoma Duru, 2019).

III. RESULT AND DISCUSSION

A. University Education and Entrepreneurship in Nigeria

For many years, higher education and entrepreneurship have proceeded in parallel but opposite to each other in the Nigerian economy. While some young people engage in entrepreneurship to support themselves, others, mostly from elite families, obtain a living by going to higher education institutions and finally being recruited into white-collar jobs. Thus, it was often assumed that if one failed educationally, there was another chance entrepreneurially. Therefore, it took time before Nigerian universities included entrepreneurship in their educational policy, and the inclusion was partly because of the high rate of unemployed and underemployed graduates and fact that the government could not offer secure employment for all graduates.

Another reason was the question of the employability of Nigerian university graduates in entrepreneurial sectors; this problem arose because there was no provision for entrepreneurship education in educational and even national policy. Finally, universities and educational authorities began to understand the necessity of tailoring educational systems to accommodate entrepreneurial courses, and gearing the curriculum towards meeting entrepreneurial needs. They already offered courses in areas such as Business Education, Business Administration, Accountancy, Economics, and Technology. However, unfortunately, for Nigerian students there were no academic or practical bridges to link between the two fields of university education and entrepreneurship (Anyebe, 2017). The general assumption was that if someone was unable to pursue university education they could follow the route of entrepreneurship.

Despite the efforts so far there is still huge gap in terms of blending university entrepreneurship courses to meet contemporary industrial sector requirements. Many universities, particularly in Nigeria but also across Africa more widely, have recognized the need to harness higher education and entrepreneurial skills only at the eleventh hour, and there are other financial and technical factors keeping these universities many steps behind their more forward-thinking competitors (Huskobla, 2019). While advanced industries and technologies are congruous with the Fourth Industrial Revolution, these universities are still trying to make the leap from the Second Industrial Revolution's technologies to those of the Third Revolution. IR 4.0 remains a mere science fiction to many universities in Nigeria.

B. The challenges from the Malaysian context

The Fourth Industrial Revolution is redefining tertiary learning all over the world. The most important aspects in effective higher education are accepting technological changes and challenges and making good use of them to enable holistic development in the learning environment, social setting, and industrial economy. In Asia Pacific nations such as Malaysia IR4.0 has affected many sectors, including education, and has received considerable attention and implementation. In Malaysia this has been achieved through Education 4.0, the most recent education system that pays attention to producing 'innovative graduates' with entrepreneurial thinking, innovative ideas, and technological skills. The system situates teachers as guides, while students are at the center of practical learning (Maria & Shahbodin, 2018).

In a study on the effectiveness of entrepreneurship education in Malaysia among private students, 41.7% of the participants responded that the programs were good, while 47.9% said they were fair. Students who rated entrepreneurship programs as 'poor' complained of more lectures than practical sessions, amounting to 84.4% of the course content. Other complaints were teachers' incompetence in terms of their skills and practical experience of the subject matter, and their use of unsuitable teaching methods. In addition, a reasonable percentage of the students did not enjoy whole-class teaching methods, preferring one-to-one methods where each student could progress at their own pace. However, individual teaching of entrepreneurship education is not possible even in private higher education institutions; it seems clear that though the institutions have been offering entrepreneurship education programs for the past thirty years, awareness of the programs' meaning and components remains sketchy among the students (Mahmood, 2014).

C. Discussion and Lessons from the Two Contexts

Entrepreneurship education in Nigerian higher education is stale and old-fashioned, mostly drawn from traditional entrepreneurs and a few simple skilled technologies such as basic computer literacy, GSM repairs, and other disciplines. Therefore, the skills of university graduates do not guarantee employability in entrepreneurial sectors. These sectors can offer a certain amount of employment opportunities, but these opportunities are insufficient, and are only in consideration of their practical skills, not their university qualifications. The employability of Malaysian university graduates is relatively better because Malaysian entrepreneurship education courses are more often in tune with the requirements of different entrepreneurial sectors. However, even in Malaysia most of the graduates are skilled in engaging in low risk and small enterprises, which are likely to go out of business in the first three years after start-up. Highly skilled risk-taking entrepreneurs are rare among fresh university graduates.

In terms of national development programs, since the 1960s Malaysia has put many policies in place, and the government has strictly adhered to these policies. Therefore, the country has been able to embrace IR 4.0 and integrate it with many of its development programs, including entrepreneurship and higher education. In contrast, the series of national development programs in Nigeria has encountered many obstacles such as poor implementation, neglect of processes, or even total abandonment. Therefore, Nigeria can only implement policies related to IR 4.0 on paper. Successive struggling governments, both military and civilian, did not consider the importance of well-grounded national policies and the need to adhere to them.

Teaching or instruction in entrepreneurship education started in Malaysia in the early 1980s, and full-fledged programs were implemented in public university curricula within a few years. Hence, IR 4.0 found its way into higher education curricula which were frequently updated. However, due to a lack of manpower, adequate facilities, and sufficient motivation, entrepreneurship education in Malaysian higher education is still not tapping the maximum potential among university students. This is evidenced in the caliber of the entrepreneurs that universities produce. For its part, Nigerian higher education initiated entrepreneurship education in 2006 to tackle unemployment, which is a challenge for the national economy, stability, and development. However, it is clear that Nigerian policymakers and higher education decision makers did not look at the bigger picture of entrepreneurship, but rather simulated traditional entrepreneurship in their attempts to address fundamental issues like economic growth and high unemployment. Nonetheless, numbers of small-scale entrepreneurs are booming in the country, but whether these entrepreneurs acquired their skills at universities is subject to confirmation.

Students' attitudes toward entrepreneurship have been unenthusiastic and even contemptuous, partially resulting from the impression that Western education should be a gateway to white-collar jobs. In contrast, entrepreneurship is seen as being reserved for the 'uneducated'. However, in both countries, necessity as well as improved profiles for entrepreneurship programs have encouraged more young people into entrepreneurship.

D. Recommendations

There is a need to have and maintain step-by-step national policies on entrepreneurship and integrate them with IR 4.0 and higher education if countries and societies are to reap the maximum benefits. This is highly apparent in Nigeria, where new policies are implemented even before the goals of the preceding ones have been achieved.

In terms of manpower, the leadership in both Nigerian and Malaysian universities, from the executive level down to departmental level, should encourage frequent entrepreneurship workshops, seminars, and step-down training of their academic staff. However, universities should also be mindful of various differentiations and typologies when designing leadership frameworks to be used in their institutions (Salihu, 2019a) It is also advisable to invite specialists with practical skills to mentor students, in a recognition that skilled entrepreneurs do not only require paper qualifications, but also practical knowledge of the subject matter.

In both countries there is a need for a serious commitment to entrepreneurship education with a reasonable budget for entrepreneurial development. This is even more necessary considering the speed at which other countries are exploring their entrepreneurial potentialities through IR 4.0.

The attitudes of Nigerian students towards entrepreneurship education should be improved through practical efforts such as modern equipment, constant interaction with expert guest speakers, and incentives for dedicated students. The skills taught should be updated regularly, so as to remain relevant to employers' demands in the labor market. Adequate opportunities for practice should be provided in order to allow students to actualize entrepreneurship right from their school environment. It should be recalled that entrepreneurship has many facets, and each requires unique space for it to develop.

There are many actors that could make a financial contribution to support entrepreneurship education, such as state and federal ministries of education, government agencies such as industrial training funds, NGOs, privately-owned commercial businesses, and other sectors, but more has to be done to collectively provide sufficient funding for course. It will not be enough to suggest that universities look inward to source money for maintaining their entrepreneurship programs.

Interest-free loans should be secured for students to provide 'seed capital.' If possible, this start-up capital should be available to all graduating students. In this regard we would suggest that the Nigerian government needs to realize that the money it is currently channeling towards the NYSC, a national service initiative, would be better spent on endowing passing-out students with start-up capital to enable them try their luck in entrepreneurship based on the entrepreneurial skills they have acquired during their university education.

E. Conclusion

This study has examined the contributions, challenges, and impacts of higher education in teaching entrepreneurship education to university students since 1982 in Malaysia and 2006 in Nigeria, with the aim of reducing unemployment among Malaysian and Nigerian graduates. The success or failure of policies translates into the achievement or breakdown of programs, and this seriously affects entrepreneurship education, especially in Nigeria.

The study traces the influence of national development programs in improving higher education and entrepreneurship in the wake of the Fourth Industrial Revolution (IR 4.0). The paper offer a detailed discussion of IR 4.0 and how it positively and negatively affects all aspects of human life personally, socially, economically, and educationally, as well as the need to embrace global change and innovation. Further, the technical and nontechnical skills required by the new revolution, and how they have affected entrepreneurial skill requirements, have been discussed. The paper conclude that IR 4.0 has not received appropriate attention in terms of entrepreneurship education, for a number of reasons: digressions from the steps needed for technological development, misappropriating funds for national development, a lack of general awareness, corruption, and a lack of updated curricula to teach entrepreneurship education in higher education.

Comparisons were made between Malaysian and Nigerian universities in terms of their approach to entrepreneurship education. The paper found that the former country, although still classified as a developing country, has achieved a good deal in its journey towards meeting the demands of IR 4.0 in its entrepreneurship education. Year by year, problems are addressed and assessed to ensure smooth improvement. In the latter country, meanwhile, entrepreneurship education in higher education started later, and more than a decade later the same courses are still being taught. Studies have shown little improvement in the rates of unemployment among graduate students who are searching for jobs and those who have embarked on an entrepreneurial career.

This is mostly attributed to a mismatch of skills between the students' training and the skills required by employers or entrepreneurship.

This paper suggest that the problems encountered by the two nations concerning entrepreneurship education are mostly comparable, but the speed at which Malaysia addresses its problems and the priority given to these issues are better than in Nigeria. Nevertheless, both countries must do more in terms of integrating entrepreneurship with higher education and IR 4.0, devoting funding, research and development, manpower, and policies to this area, as well as motivating students to embrace entrepreneurship as a modern career in which they can take great pride.

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