

# Entrepreneur Universal Education System: Future Evolution

Khaled Elbehery, Hussam Elbehery

**Abstract**—The success of education is dependent on evolution and adaptation, while the traditional system has worked before, one type of education evolved with the digital age is virtual education that has influenced efficiency in today's learning environments. Virtual learning has indeed proved its efficiency to overcome the drawbacks of the physical environment such as time, facilities, location, etc., but despite what it had accomplished, the educational system over all is not adequate for being a productive system yet. Earning a degree is not anymore enough to obtain a career job; it is simply missing the skills and creativity. There are always two sides of a coin; a college degree or a specialized certificate, each has its own merits, but having both can put you on a successful IT career path. For many of job-seeking individuals across world to have a clear meaningful goal for work and education and positively contribute the community, a productive correlation and cooperation among employers, universities alongside with the individual technical skills is a must for generations to come. Fortunately, the proposed research "Entrepreneur Universal Education System" is an evolution to meet the needs of both employers and students, in addition to gaining vital and real-world experience in the chosen fields is easier than ever. The new vision is to empower the education to improve organizations' needs which means improving the world as its primary goal, adopting universal skills of effective thinking, effective action, effective relationships, preparing the students through real-world accomplishment and encouraging them to better serve their organization and their communities faster and more efficiently.

**Keywords**—Virtual education, academic degree, certificates, internship, amazon web services, Microsoft Azure, Google cloud platform, hybrid models.

## I. INTRODUCTION

EDUCATION is a complex issue in a constantly changing social, political, economic, and technological world in addition to the many challenges for policy makers and practitioners. Many people use "job" and "career" interchangeably. While it is true that each of them involves working and a wage, a career however goes well beyond a pay check. A career is a commitment, a hard work, a passion, and the individual should be mentally ready for it. It is well said that the best career is the one that makes you smile every day.

Obviously, there is no solution yet to offer students one method of education to prepare them for the uncertainties of the future; educational providers either offer students the fast-paced hands-on experience in the form of certificates that could at least get the individual a job opportunity to help

establish life stability even for the short term or take the alternative approach that comes with a cost such as a long-term educational program in the form of a college degree as in a Bachelor degree, a Master, and a Doctorate (PhD) that could offer long-term stability and a career. Employers on the other hand are in a need for individuals ready to take on tasks for the job, and over time those individuals will gain the expertise to enable them doing even a better job, however they will not be qualified for management positions due to the inadequacy of higher education [1].

Universities are forming partnerships with leaders in industry and businesses in the form of internships, traineeships, and apprenticeships to make work-placements for students easier to obtain, and for the students who participate in such programs, they find themselves graduates with at least an opportunity of a head start and at best, a foot already in the door of their career.

The current academic education system focuses its primary goal to improving the student's knowledge, moreover, the supplementary topics such as Math, English, and Social studies; perhaps the topics need to be revised to adapt to market and employer demands [2].

The research paper begins with covering the virtual education system's concerns with regard to the skills and employer's demands, and sheds some light on the bureaucracy that is considered one of the negative factors to the progress of the educational system. It explains the necessary steps to proceed with the approach of earning a college degree and a technical certification simultaneously that is considered the best path to a growing career. The remainder of this research paper will clarify the goals, benefits, and curriculum of the approach.

A case study on cloud computing as an example is presented along with the benefits of applying the proposed education system from expanding the hiring opportunities with higher salaries to a quicker valued promotion track career.

In summary, the foundation of the program is achieving economic success for the individual, offering benefits, and compensation could last for many years of employment, development, research, and career advancement.

## II. VIRTUAL EDUCATION

Virtual or online education has grown significantly over the past few years because it is financially less expensive than the traditional education system. It offers great flexibility to organize the student's time between study, work, and family which increases the individual's qualifications that help with career growth and promotion opportunities [3].

Khaled Elbehery is with the Devry University, CO 80126 USA (corresponding author phone: 303-726-3501; e-mail: khaled.elbehery@gmail.com).

Hussam Elbehery is with the October 6 University (O6U), GIZA 12572 EGYPT (e-mail: hussam.elbehery@gmail.com).

Internet search engines such as Google, Bing, etc., have reduced dramatically the number of books that are sold or read by working-adult students, as well as recent high school diploma graduates.

In today's world, virtual online education has made a huge impact on education and its counterparts as shown in Fig. 1, which presents the international view for virtual education future [4].

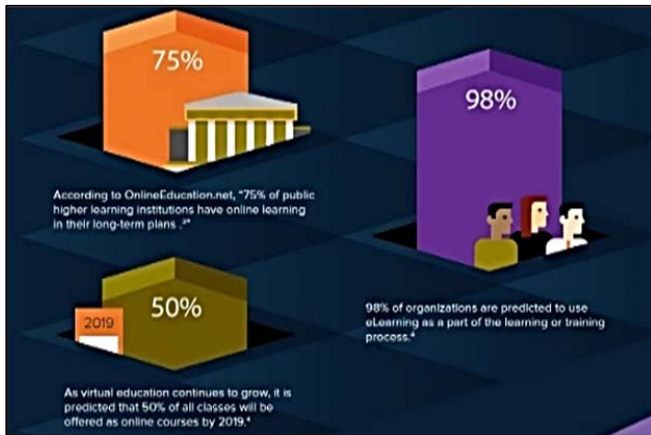


Fig. 1 Virtual education future [4]

### III. CURRENT EDUCATION SYSTEM'S CONCERNS

#### A. Education, Skills, and Employer Demands' Gap

For job recruiters, relevant job-related knowledge is as important as the degree itself, and young job seekers are beginning to realize that several years of learning at university no longer suffice to succeed in the world of work. Universities worldwide produce millions of graduates each year, and according to global studies surveys, more than 50% of new graduates around the world are unhappy with their chosen field of study. According to McKinsey as shown in Fig. 2 [5], with the global economic situation these days, we could face a potential surplus of around 90 million low-skill workers and a shortage of about 38 to 40 million high-skill workers by 2020, as shown in Fig. 2. The skills gap is obvious among students, universities, and employers, and many employers are not able to find the right candidates with the proper skillset despite there being many jobs opening available.

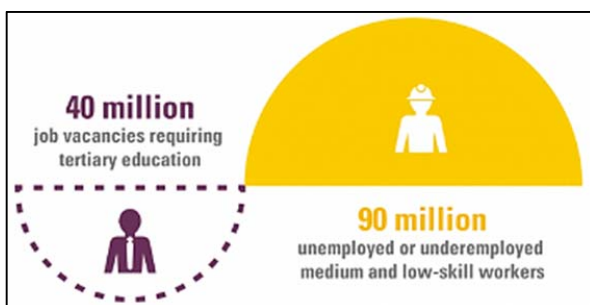


Fig. 2 Projected skills gap in 2020: A striking imbalance [5]

The unemployment rate refers to the percentage of people

actively seeking employment and currently available to start work. Historically, graduates, and particularly the individuals with higher levels of education, have better job opportunities that increase up to 88% for men and 79% for women; in general, education is generally good insurance against unemployment, even in difficult economic times.

#### B. Bureaucracy

Regulations and policies for the work place environment are established to assure the successful flow of business operations. However, in many businesses, not only in the public sector and government's agencies but also in the private sector, actual productive work is sometimes outweighed by the bureaucratic behaviors of the individuals who are in charge and who focus more on outdated policies.

Unfortunately, appointed bureaucrats can forget about the goals, the results, and the objectives which all cause more harm, in addition to a huge amount of time that is wasted with excessive meetings, reporting, and paper work.

#### C. Credentials (Degree vs. Certificate)

The two available choices when it comes to higher education are a degree program or certificate program; both programs intend to accelerate the individual's skills and to help develop knowledge in a certain field. With regard to the time required to complete a certificate or degree course, it can take anywhere from few months to a year or even years in some cases.

An appropriate higher education degree is a must to be able to obtain a good job that helps to establish a career and stability. The individual with a Bachelor degree, a Master, or a Doctorate (PhD) is more likely to be exposed to 57% of job opportunities; however, when it comes to the level of being ready to take on the job responsibilities day one, individuals with certificates are likely to be favored.

Degree programs cover a wide variety of fields, from math to science, and to English to history, however, earning a certificate is less expensive and more knowledge specific to a certain industry [5].

Earning a Bachelor's degree, a Master's, and a Doctorate (PhD) will be a long time-consuming task, resources, and most importantly, financially exhausting. Obtaining a job can definitely outweigh the burden of education expenses, and the higher the level of degree earned, the higher the earning potential can be, however earning a certificate could be also tempting since it could lead to a job faster [6].

Unprecedented circumstances such as the COVID-19 pandemic has meant that many people have lost their jobs and are willing to do anything to return to work or to seek new employment opportunities in order to pay their bills, which influences the decision to study a degree versus a certificate.

### IV. ENTREPRENEUR EDUCATIONAL SYSTEM

#### A. Goals

As a known fact, the educational system needs experienced and knowledgeable teachers and professors from specific fields such as civil engineering, medicine, or law; however,

finding such individuals to teach the newest technologies such as cloud computing, space, quantum computing, and gravitational energy, etc., is more problematic. With these new fields and technologies, it is almost impossible to find an experienced professor since they have not been taught in university curriculums, and are often growing and developing faster than any known technology ever taught before.

Supplementary courses such as math, history, writing etc., are no longer cohesive enough to meet the major objectives of the new technologies, and therefore, other courses and materials such as technical leadership, presentation skills, and project management can help qualify the individuals for a technical role and also for a leader role in a short period of time [7].

### B. Benefits and Curriculum

For the purpose of improving the current educational system or even to start from scratch and produce a productive outcome, the goals and benefits should be based on facts not theories; it should be based on a practical view of the student, the employer, and the education system itself.

- 1) A coherent conjoining not embedding between the degree and certificate curriculum.
- 2) Efficient courses along with reducing the numbers of courses; this offers flexibility and helps the students focus more on what should be learned and worry less about the timeline of the course.
- 3) Effective supplement courses that are more closely related to new technologies and that serve the student's future career such as leadership courses that prepares them to be ready to take on such roles when the opportunity is available.
- 4) Guaranteed employment through a well-paid internship while studying enabling the student to have financial stability: This can help the student to better focus on the curriculum as it relates to their internship, resulting in a successful outcome for both employers and students. After successfully graduating, employers can continue to invest in the individual through providing a career path that should last for many years, providing that the individual continues adding a value to the employer's organization.
- 5) An adaptive education program with flexibility and autonomy aiming to assure students that the topics in the curriculum correlate with the latest technology and services offered by the employer: That also brings to the table a significant increase in profitability, return on investment and a reduction of bureaucracy at the work place for the employer.
- 6) Developing a team work environment early on by providing students with the tools and capabilities they need to prepare for practical application of their knowledge in their fields, not only at a national level but also at an international standard as well.
- 7) Incentive educational program for the individuals after the graduation who are considering continuing the higher education such as a Master or a Doctorate (PhD): The

thesis or the dissertation can be based on a real-world project, reflecting on their experiences and the actual needs of the employer and industry demands.

## V. CASE STUDY (CLOUD COMPUTING)

### A. Public Cloud Providers' Business

Cloud platforms are a versatile business; they offer different features to accommodate a company's size and type of industry. There are some similarities and distinctions with regard to the services they offer and pricing as well. Fig. 3 shows that "the cloud infrastructure services spend in Q3 2020 continued to benefit from the fallout of the COVID-19 pandemic. The worldwide cloud market grew 33% to US \$36.5 billion, which was US \$2.0 billion higher than the previous quarter and US \$9.0 billion up on Q3 2019", according to Canlys data [8].

Dependence on cloud-based services remained high across all sectors of the economy, including governments, businesses and consumers, as social-distancing measures continue to persist. The return of stricter lockdown measures in certain regions over the coming months will mean that the cloud will remain vital for sustaining business operations, remote working and learning, as well as customer engagement [8].

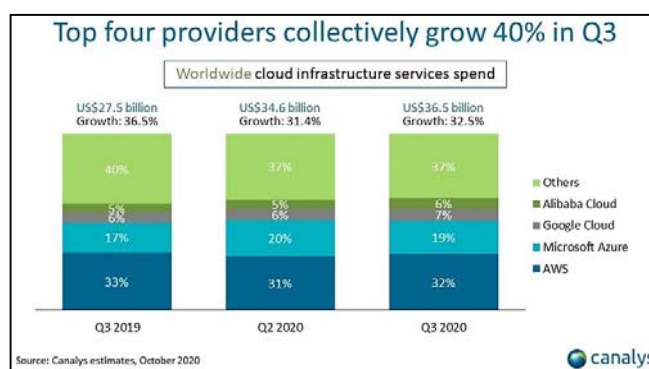


Fig. 3 Growth rate of top cloud providers [9]

According to the Canlys article, the pandemic boosted cloud consumption in Q3 2020 "Amazon Web Services (AWS) has led when it comes to cloud service providers in Q3 2020, increasing its share of total spending from the last quarter to 32%. It grew its business by US \$2.6 billion in Q3 compared with the same period last year, continuing its rapid expansion. Overall, AWS generated more revenue than the next three largest cloud service providers combined. Microsoft began with another strong performance in its Azure business, growing 48% on an annual basis to reach a 19% market share. This is up from a 17% share in Q3 2019. It reported an increase in long-term contracts, highlighting growing commitment among its larger customers as they migrate mission-critical workloads to Azure. Google Cloud accelerated its enterprise business, as it focuses on increasing channel involvement in deals as well as partner enablement. Google Cloud retained its position as the third largest cloud service provider with a 7% share. Alibaba Cloud continued to

lead the Chinese market, where cloud computing is a key part of the government's development plans. It is also the overall leader in the Asia Pacific region. Alibaba Cloud accounted for 6% of the worldwide market" [8].

#### B. Public Cloud Providers' Customers

Amazon Web Services (AWS) hosts cloud services for well-known customers such as Netflix, Airbnb, Unilever, BMW, Samsung, MI, Zynga, etc. (see Fig. 4).

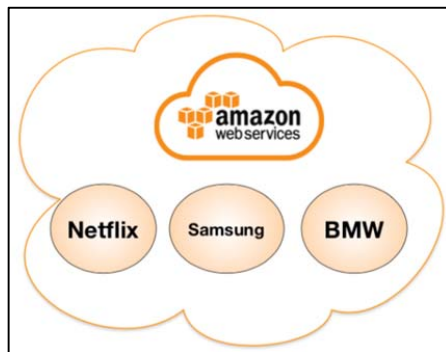


Fig. 4 AWS Customers

Azure's major customers are Johnson Controls, Polycom, Fujifilm, HP, Honeywell, Apple, etc. (see Fig. 5).

Many well-known companies have put their confidence in Google Cloud because of their other shared services such as Google Search and YouTube. Some of those customers are HSBC, PayPal, 20<sup>th</sup> Century Fox, Bloomberg, Dominos, and more (see Fig. 6).

When it comes to choose a cloud service provider, the service's price is not the only factor to take into consideration;

other factors also to be considered including the location, latency, higher bandwidth capability, and compliance with the customers' Service Level Agreement (SLA). Fig. 7 shows the global locations of the top-three cloud providers: AWS, Azure, and Google.

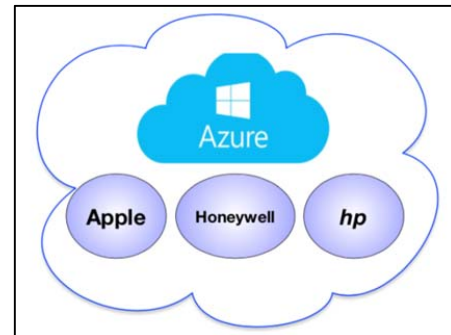


Fig. 5 Azure Customers

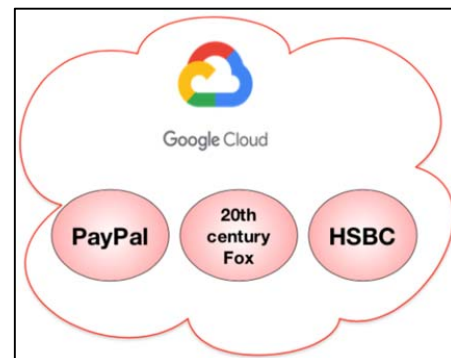


Fig. 6 Google customers



Fig. 7 Global locations of top three cloud providers: AWS, Azure, and Google GCP [10]

#### C. Public Cloud Providers Certificates

Certificates validate cloud expertise to help organizations build effective and innovative teams for cloud initiatives

through diverse certification exams that are designed to empower individuals and teams to meet their unique goals. It is worth to note that some can take up to 6 months, a year or



even two years to complete; moreover, to keep the certification's credentials up to date, recertification is required every two or three years for the purpose of keeping up with the technology that is changing and growing exponentially. An important thing to mention is that IT professionals claim that certification helps them perform complex tasks more confidently. The three popular globally dominant certificates career paths are shown in Figs. 8-10 [9]-[11].



Fig. 8 AWS certificates



Fig. 9 Microsoft Azure Certificates



Fig. 10 Google GCP Certificates

#### *D. Entrepreneur Education System Curriculum (Cloud Computing Career Path)*

The program is a three years full-time program and is arranged normally in 8 x 8-week semesters (2 semesters per year). The degree is awarded upon successful completion of determined credit hours. There are advanced modules in cloud computing programming which are the graduation project modules in the final year. The introduced program aims at qualifying IT professionals in the field of cloud computing and cloud networks linking scientific backgrounds and modern techniques for the labor market. Also, the proposed program provides a unique learning experience to enable individuals with their expertise and skills to compete in the job market as a result of the technologically up-to-date curriculum, varieties of related business field facilities, and more importantly faculty members that are involved with the technology.

A cloud computing program relies not only on theoretical the background but also on hands-on experience to provide individuals with unique skills and help with lifelong career opportunities.

By the end of the program, the individual graduates with a scientific degree and also cloud provider's certificates that collectively qualify the graduate to be the best professional in the market. The supplement topics of the program such as project management, presentation techniques, problem solving strategies, and data analytics empower the individual with leadership skills.

The undergraduate program will provide students with a state-of-the-art, high-quality education relevant to local and international markets. The unique program offers several advanced specializations complementing those of international universities.

The program is considered an enabler of technology, devising new ways to use cloud computing. Researchers are going to be able to develop effective ways to solve cloud computing problems and enable those graduates in a short time to step up as cloud computing managers, planning and managing organizational technology infrastructure. As well as provide a versatile route through the cloud computing field to allow students to acquire expertise in a wider range of cloud computing subjects. The cloud computing pathway further distinguishes its graduate with specialized knowledge and experience in development techniques for cloud computing and intelligent systems. Fig. 11 shows the three-year undergraduate program curriculum while Fig. 12 presents the proposed curriculum for the two-year postgraduate program [12], [13].

#### VI. TECHNOLOGY INITIATIVES

Cloud computing in addition to other advanced technological fields such as quantum computing and space could be supported by the proposed Entrepreneur Universal Education system detailed in the research paper. Quantum computing organizations and space agencies across the world have already started a productive initiative by offering lectures, courses, and training sessions for the purpose of

attracting the talent to help with the coming challenges of some of those initiatives.  
these technologies. The following provides a brief review of

First Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Calculus	None	√		√
Critical Thinking	None	√		√
Fundamentals of Computer Science	None	√		√
Fundamentals of Data Storage	None	√		√
Second Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Communications Skills	None	√		√
Mathematics	None	√		√
Fundamentals of Computer Networks	Fundamentals of Computer Science	√	√	
Fundamentals of Data Structures	None	√		√
Third Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Business & Economics	None	√		√
Introduction to Information Security	Fundamentals of Computer Networks	√		√
Fundamentals of Cloud Computing	Fundamentals of Computer Networks	√	√	√
Fundamentals of Windows OS	Fundamentals of Computer Science	√	√	√
Fourth Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Leadership	None	√		√
Fundamentals of Linux OS	Fundamentals of Computer Science	√	√	√
Fundamentals of Virtualization	Fundamentals of Computer Networks	√	√	√
Introduction to OpenStack	Fundamentals of Cloud Computing	√	√	√
Fifth Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Computing Processes for Amazon AWS	Pass successfully all courses for semesters 1, 2, 3, and 4	√	√	√
Computing Processes for Microsoft Azure	Pass successfully all courses for semesters 1, 2, 3, and 4	√	√	√
Computing Processes for Google Cloud GCP	Pass successfully all courses for semesters 1, 2, 3, and 4	√	√	√
Cloud Networking for Amazon AWS	Pass successfully all courses for semesters 1, 2, 3, and 4	√	√	√
Cloud Networking for Microsoft Azure	Pass successfully all courses for semesters 1, 2, 3, and 4	√	√	√
Cloud Networking for Google Cloud GCP	Pass successfully all courses for semesters 1, 2, 3, and 4	√	√	√
Sixth Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Cloud Storage for Amazon AWS	Pass successfully all courses for semesters 1, 2, 3, 4 and 5	√	√	√
Cloud Storage for Microsoft Azure	Pass successfully all courses for semesters 1, 2, 3, 4 and 5	√	√	√
Cloud Storage for Google Cloud GCP	Pass successfully all courses for semesters 1, 2, 3, 4 and 5	√	√	√
Cloud Security for Amazon AWS	Pass successfully all courses for semesters 1, 2, 3, 4 and 5	√	√	√
Cloud Security for Microsoft Azure	Pass successfully all courses for semesters 1, 2, 3, 4 and 5	√	√	√
Cloud Security for Google Cloud GCP	Pass successfully all courses for semesters 1, 2, 3, 4 and 5	√	√	√

Fig. 11 Undergraduate program curriculum

#### A. Quantum Computing

IBM Quantum will sponsor 5,000 students to attend an intensive quantum computing course with the goal of making quantum computing education available and accessible to students around the world. The course does not need any previous experience with quantum computing, and will be taught by MIT scientists and Oxford quantum professors. IBM has provided attendees with Qiskit to facilitate understanding the foundations of quantum computing [14].

CERN (European Organization for Nuclear Research) openlab has provided a free two-month course focused on quantum computing basics that does not require any previous knowledge of quantum physics, and is taught by CERN scientists alongside professors from the University of Oviedo in Spain [15].

#### B. Space

Space science has many disciplines such as space exploration, space medicine, and astrobiology. The Space Science Department aims to provide world-class education and nurture research expertise at the undergraduate and graduate levels. The focus is on developing creative, competent and committed professionals in core areas and in fundamental sciences linked to the Space Science arena, capable of cooperating and collaborating with space practitioners as well as in allied sciences and applications.

The employment prospects for graduates having a BS in Space Science with a major in any discipline are good. The background that students gain in analytical work and computing in all specializations of space science gives them desirable skills in many other scientific, computing, data

processing and business areas [16].

First Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Cloud Database for Amazon AWS	Pass successfully all undergraduate program courses	√	√	√
Cloud Database for Microsoft Azure	Pass successfully all undergraduate program courses	√	√	√
Cloud Database for Google Cloud GCP	Pass successfully all undergraduate program courses	√	√	√
Cloud Monitoring and Analytics for Amazon AWS	Pass successfully all undergraduate program courses	√	√	√
Cloud Monitoring and Analytics for Microsoft Azure	Pass successfully all undergraduate program courses	√	√	√
Cloud Monitoring and Analytics for Google Cloud GCP	Pass successfully all undergraduate program courses	√	√	√
Second Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Cloud Advanced Services for Amazon AWS	Pass successfully all courses in First semester in Graduate Program	√	√	√
Cloud Advanced Services for Microsoft Azure	Pass successfully all courses in First semester in Graduate Program	√	√	√
Cloud Advanced Services for Google Cloud GCP	Pass successfully all courses in First semester in Graduate Program	√	√	√
GOV-Cloud for Amazon AWS	Pass successfully all courses in First semester in Graduate Program	√	√	√
GOV-Cloud for Microsoft Azure	Pass successfully all courses in First semester in Graduate Program	√	√	√
GOV-Cloud for Google Cloud GCP	Pass successfully all courses in First semester in Graduate Program	√	√	√
Third Semester				
Course Name	Prerequisite	Lecture	Lab	Tutorial
Multi-Cloud for VMware	Pass successfully all courses in First and Second semesters in Graduate Program	√	√	√
Multi-Cloud for Alibaba	Pass successfully all courses in First and Second semesters in Graduate Program	√	√	√
Internship	Pass successfully all courses in Graduate Program	Amazon AWS Microsoft Azure Cloud GCP VMware		

Fig. 12 Postgraduate program curriculum

## VII. CONCLUSION

No doubt, virtual education, with its flexibility, has succeeded to create a new era in education that in many cases provides the best alternative to traditional educational and also helps students make decisions regarding the next step in their education and career by offering more courses appropriate to their budget, field of interest, and appeal to them [17]. However, many employers still prefer industry certificates over a university degree since the certificate represents skills and hands-on experience and so, not having the industry certificates can be a barrier to hiring and advancement as well.

Some universities have embedded industry certificates into degree programmes; however, these are often supplementary materials to the existing courses. In reality, the student is mandated to complete the course curriculum but not the industry certifications. This in turn focuses the attention of students to completing the course to obtain the degree and overlook the importance of the industry certifications.

With the fast-growing technologies and innovations introduced by the entrepreneurs around the world, there is a growing need for a new education system capable of keep up with the demands of tech companies and sectors. There is a need for a unified education system that offers educational programs that empower individual students with the knowledge they need to make them ready for the job in the form of a degree and/or a certificate as well, and there is a need for a universal education system that could be

implemented any location and in any country.

The topic of this paper; “Entrepreneur Universal Education System” is a manifestation of a logical and realistic connection between the education system providers, tech companies/ industry, and the student. The proposed education system produces a graduate with a degree and credible technical certificate simultaneously, who is ready to take on the duties required for the job opportunities available and also prepared to take on a leadership role.

The system utilizes the employer's work environment including the labs, facilities and factories around the nation or around the globe as an educational facility which can provide students with the knowledge and the hands-on experience required by industry. With the new education system, tech companies fund the education journey for students and offer a job opportunity and career path with a high-paying salary after graduation. The Entrepreneur Universal Education System is adaptive, effective, and it is way to build the future.

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