

Volume 25, Special Issue**Print ISSN: 1099 -9264****Online ISSN: 1939-4675**

ACADEMIA-INDUSTRY PARTNERSHIPS TO DEVELOP CLOUD COMPUTING SKILLS FOR STUDENTS: A CASE STUDY FROM AWS ACADEMY

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ABSTRACT

Owing to the outbreak of COVID-19, the educational system worldwide has been significantly impacted; it prompted educational institutions' closure, which adversely affected the academic calendar around the globe. Internet learning has emerged as the nearest alternative for off-line learning in the absence of conventional classroom instruction and one-to-one contact. In recent years, the technology workforce education structure has changed significantly, with the tech industry providing certification-based academic programs to train potential engineering workers using online learning. These programs typically work with a university to offer various types of learners specialized skill training. In this study, we briefly highlight the AWS Academy, which combines academic theories of cloud computing with their applications as acquired in the industry to enable students to have theoretical and practical skills that will prepare them for cloud computing careers. This study attempts to examine the relationship between academic and industry collaboration. Finally, we address some key measures that could improve a successful relationship between the university and industry, particularly in developing countries to cloud computing in education.

Keywords: AWS Academy, Partnerships, Cloud Computing, Online Learning, Cloud Skills.

INTRODUCTION

The renowned attributes of cloud computing are its agility and flexibility. For the most part, few issues have threatened such arguments as the COVID-19 pandemic. Today, as universities and their numerous partners utilize technology such as interactive classrooms and multimedia networks to perform all facets of learning and operations, universities use various course delivery and organizational models (Huang et al., 2020). Because of this, the pandemic has increased cloud adoption in an area that is traditionally slower to embrace them. The impacts of the COVID-19 pandemic on schooling have been far-reaching for educators, teachers, and parents alike (Onyema et al., 2020). Thousands of universities worldwide made a move to distance learning due to it being too expensive to stay available (Rapanta et al., 2020). This is a cultural change that most people were not preparing for. Furthermore, as the pandemic progresses, students, teachers, school employees, and school board members are now faced with a daunting question: Where do we go from here? Efforts to allow remote learning provide course material, and link schools and students during this

period would hinge on educational institutions' capacity to exploit cloud computing (Erhan & Gümüş, 2020). Companies are mainly engaged in cloud computing, computer analytics, and the internet of things due to their economic potentials (Jahantigh et al., 2019). People with the relevant expertise will continue to be in high demand as cloud technologies continue to revolutionize organizations worldwide. Cloud computing is among the most sought-after capabilities on the market in 2020, according to LinkedIn Learning (after block chain) (The Most In-Demand Hard and Soft Skills of 2020, 2021). The Vietnam cloud computing service market is projected to grow from \$165 million in 2018 to \$291 million by 2024, according to a Research and Markets report (ltd, 2021). Thus, it is urging universities to incorporate in their curriculums skills that contribute to better work and career opportunities for students upon graduation is advantageous (Nghia, 2018). Employers want students who are well versed in practical expertise, as well as qualified in its implementation. The cumulative advantages that cloud computing have to give the education sector are substantial. This is a mobile-centric and convenience-driven student-centric model that is intended to support those who want fingertip access to learning. The cloud empowers teachers by allowing better class assignments, promoting access to information, and offering endless collaboration and directed learning opportunities (Fernández-Caramés & Fraga-Lamas, 2019; Reimers et al., 2020). There is no better choice concerning Information Technology (IT) teams than using the cloud as students need to ramp up apps and new learning opportunities quickly while incurring reduced costs (Ramachandran et al., 2014). Higher education's most significant obligation is not to offer only a bachelor's degree but rather to provide students the ability to develop and leverage different talents and expertise while improving themselves and the community (Bowen, 2012; Murphy, 2020). Higher education institutions that are more important to the needs of the economy and the population have, as one of their strategies of assistance, joint activities with the sector (Chatterton & Goddard, 2000; Fernández-Caramés & Fraga-Lamas, 2019). If businesses remain productive, they will constrain universities from exchanging capital and information, which must be sought elsewhere. When companies are increasingly changing, workers with the requisite cloud capabilities are in high demand. A free, ready-to-teach cloud computing program is offered to colleges and universities to help students train for certifications and in-demand cloud work. The AWS program exists to help educators keep pace with AWS Cloud innovation to help students lay the groundwork for tomorrow's rapid job market growth (Goteng, 2019; Soltys, 2020a). At present, policymakers accept industrial-academic collaborations as they can directly affect the country's progress (Autio, Hameri, & Nordberg, 1996). We aim to research the relationships between industries and universities and explore new win-win and mutually beneficial alliances.

CASE STUDY AWS ACADEMY

Cloud providers (or cloud service providers) are organizations that — well — provide network-wide, flexible services for IT environments such as public clouds or managed private clouds. Many cloud service providers additionally provide Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS) (Goteng, 2019; Höfer & Karagiannis, 2011). A great range of advantages can be predicted, such as delegated

management and more cost-effective business processes. Although there are only a few well-known public cloud providers, hundreds of other cloud and cloud service providers are in the world. AWS Academy gives educational and non-profit institutions ("institutional organizations" in general) access to an AWS platform to provide their students with cloud computing courses (AWS Academy, 2021). With the involvement of AWS Academy, institutions will enable students to obtain industry-recognized AWS certificates and become skilled in Amazon Web Services (AWS) (Durban; Traveler, 2021). Courses are created and conducted through AWS Academy. In each course, various subject areas are covered by the AWS Academy curriculum.



FIGURE 1
LIST OF POPULAR CLOUD SERVICE PROVIDERS

AWS Academy's course is packaged in a modular format that can be delivered in an educator-led or virtual classroom environment for synchronous or asynchronous learning (AWS Academy, 2021). Each direction is aimed at helping students to prepare for an AWS certification. Students are provided with free qualification examinations and discounted course-aligned certification exams. The AWS Academy curriculum is designed and maintained by AWS Theme Experts and represents existing programs and current best practices. AWS Academy certified educators whom AWS trains are teaching courses to assist students in acquiring AWS technology skills. AWS Academy empowers educators to provide a meaningful learning experience that enables students to develop industry-recognized certifications and on-demand cloud employment with professional development opportunities and training in line with AWS certifications (Soltys, 2020b; Traveler, 2021). AWS Academy participants receive a variety of benefits that are intended exclusively for use by institutions, educators and students enrolled in AWS Academy, including (1) Access to courses established and maintained by AWS; (2) Updates to courses representing recent AWS releases and best practices; (3) AWS Academy directory lists of participating institutions on the AWS Academy website after the distribution of the AWS Academy class. The learner

will be informed when opportunities are available by their Regional AWS Academy Program Manager. If an AWS Academy course has ended successfully, students can access a free practice test and a serialized discounted AWS certification voucher. The membership of AWS Academy starts at the institutional level on participatory principles. The applicant may not be able to serve as the Central Contact Point (CPOC) for the organization they represent, nor may they be able to supply the name and contact information of someone capable of taking action in this capacity. Institutions meeting the following requirements can qualify for this: (a) Institution provides an approved program; (b) Provide AWS Academy courses in the educator-led or virtual classroom environment for students as synchronous (e.g., real-time) or asynchronous learning.

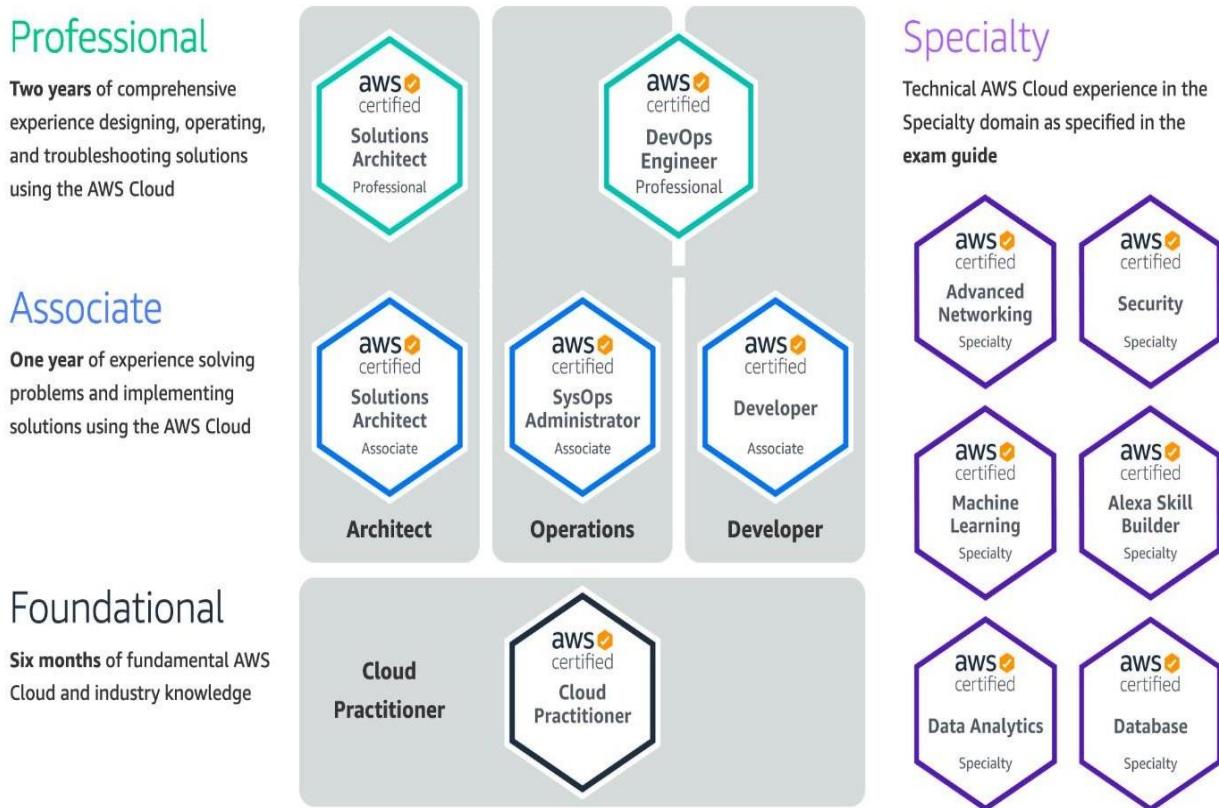


FIGURE 2

AWS CERTIFICATION PATH

- (1) Institutions can integrate AWS Academy course programs into their Learning Management System in an asynchronous way: (2) AWS Academy courses (LMS). Students need to be signed in, and educators will receive a connection to a course for their AWS Training and Certification account. All class formation procedures used for the (synchronous) on-the-ground classes should be followed (AWS Academy, 2021).

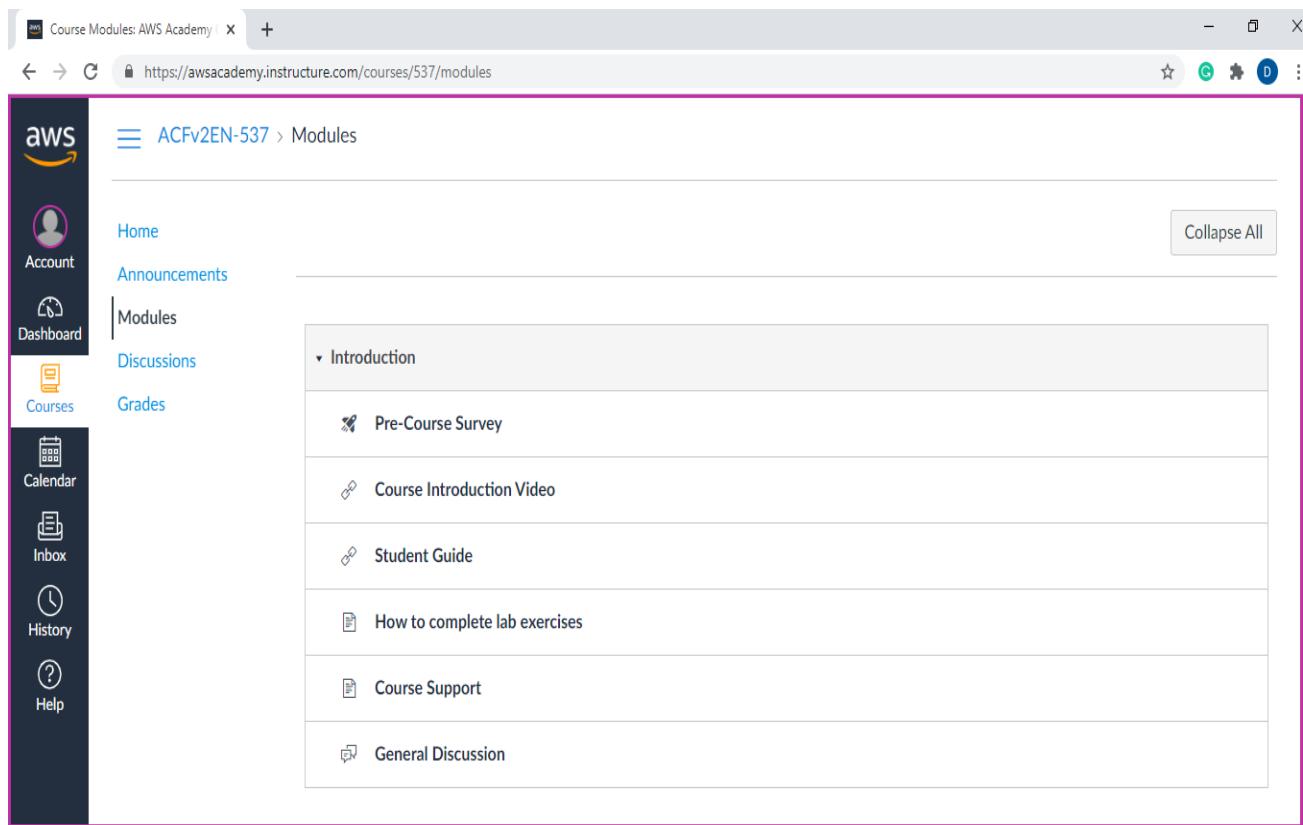


FIGURE 3
AWS ACADEMY LMS SYSTEM

DISCUSSION

In the aftermath of the outbreak of COVID-19, major cities worldwide have been on lockdown due to industrial activities being suspended and national governments in crisis. As a result, workers in sectors heavily reliant on IT services must operate remotely to keep companies going (Donthu & Gustafsson, 2020). Cloud computing technology supports information technology capabilities that allow increased access to data services and enhanced global connectivity between people and businesses. A broad range of organizations, such as media firms, financial companies, educational institutions, and multinationals, will be able to give their consumers and users a multitude of mobile device solutions (Akpan, Udo & Adebisi, 2020; Traveler, 2021). Following the failure of COVID-19, cloud technology in technology-driven industries is likely to support workplace environments that can be run remotely for some time (Donthu & Gustafsson, 2020). This is also expected to have a favorable effect on the overall business growth. To persist in a post-pandemic environment, virtually all post-secondary institutions need cloud infrastructure to operate under agile learning models. There are some reasons why AWS Certifications should be invested in learners (Godwin, 2021):

(a) The Top Technology Focus Field for Companies is Cloud Computing

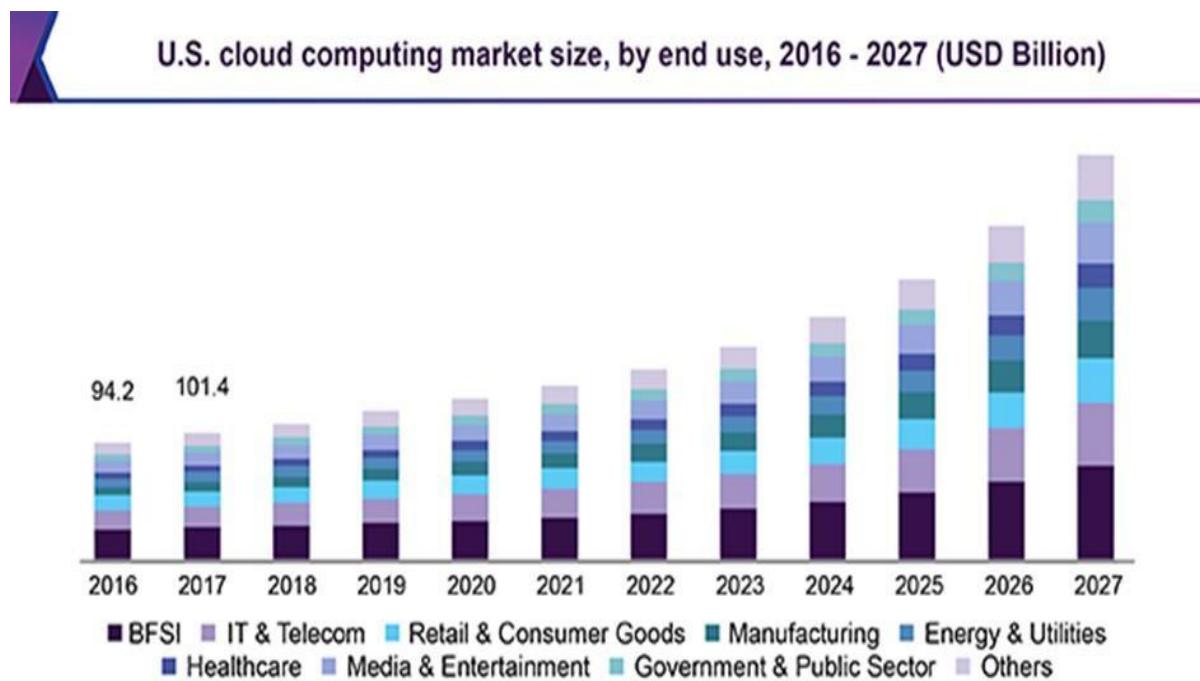
No wonder companies are starting to construct their cloud infrastructure. In fact, 43% of global IT decision-makers agree that by 2020, cloud computing will remain a top investment priority. Consequently, IT decision-makers proactively address ways to upskill their internal staff to fulfill their needs for cloud adoption. In reality, 56 percent of IT decision-makers claim that by educating their current employees, they will aim to close skills gaps, a 17 percent improvement over the survey results of 2019. Moreover, as opposed to just 59 percent last year, 80 percent of IT managers approved their workers' training (IT Skills and Salary Report, 2021). For IT professionals, this is good news: organizations emphasize their internal workers and pursue more resources to promote the professional advancement of their employees.

(b) Companies Consider their Trained Workers as a Strategic Advantage.

In gaining certifications, more and more IT leaders value their workers. Of the 80% of IT decision-makers who approved training, for instance, 70% of them did so for their workers to receive a credential or complete recertification. These encouraging trends indicate that IT leaders see the importance that accredited workers offer their organizations (Cloud Computing Market Size, Share | Industry Report, 2020-2027, 2021). A convincing 94% of global IT decision-makers accept that qualified team members have added value above and above the certification expense and conclude that helping to close skills gaps is their most significant gain (IT Skills & Salary Report, 2021). According to a new study completed by Enterprise Strategy Group, an independent analyst firm, to draw on Global Awareness results, 97% of companies employing AWS Accredited employees say this puts their business in a stronger competitive position to thrive over the next three to five years (Godwin, 2021).

(c) There is a strong Demand for AWS Certificates

AWS Certifications are in high demand, not surprisingly, with AWS as a top technology focus area for 2020. In reality, the top 10 IT certifications that IT professionals planned to seek in 2020 include four AWS Certifications (Godwin, 2021). These include AWS Architect-Associate Certified Solutions (#1), AWS Architect-Professional Certified Solutions (#3), AWS Certified Cloud Specialist (#5), and AWS Certified Security-Specialty (#10) ("Top 10 Certifications You Can Get In 2020", 2021). Besides, IT professionals accept that having one or more IT certifications, including better job results, places them in an excellent professional role (The Most In-Demand Hard and Soft Skills of 2020, 2021). That may be why at least one credential is earned by 87% of IT professionals, an improvement of 2% from last year's figures (Cloud Computing Market Size, Share | Industry Report, 2020-2027, 2021).

**FIGURE 4**

US CLOUD COMPUTING MARKET SIZE (CLOUD COMPUTING MARKET SIZE, SHARE | INDUSTRY REPORT, 2020-2027, 2021)

The end goal is to use technology to fulfill the learning needs of students. Compared to conventional educational operations only last year, the most innovative institutions would go way beyond expectations to enhance the educational experience. For decades, this paradigm change has been on the horizon for higher education. Remote learning has been around forever. It was made simpler by personal computers thirty years ago. Five to ten years ago, it was made more viable by the cloud (Traveler, 2021). The pandemic moved this move within most higher education institutions to the top of the to-do lists (Soltys, 2020a).

CONCLUSION AND SUGGESTION

This paper discusses the different possibilities for using the new cloud computing technology for inclusion in the cloud computing curriculum. The syllabus that is offered to teach all of the new cloud-based tools and operations on the AWS cloud platform, which millions of consumers use, including major companies, entrepreneurs, and government agencies around the globe, is the AWS Academy syllabus. This guide's material will range from the most basic concepts of cloud computing to an intermediate level of understanding of cloud creation, architecture, and operations. Students who complete these courses can learn about creating cloud-based software, designing and testing cloud solutions to support business operations, as well as the process of installing and troubleshooting cloud solutions. When participants in the 2020 Global Awareness survey were asked if IT certifications are worth it, the response was yes. IT professionals see an improvement in their job effectiveness, including better quality of work, increased commitment, and faster job

performance after gaining certification. IT leaders believe that their trained workers are more efficient, more able to detect issues, and more likely to satisfy customer requirements. While organizations are investing more in cloud technology, they are not slowing down. To be more precise, they are growing their investment in their current employees' up skilling by using certifications to fill existing skill gaps. IT professionals are taking aggressive steps to further their cloud computing expertise and are aiming to seek AWS Certifications this year more than any other credential. It is gratifying to see that the effort IT professionals put in to improve their skills and validate their knowledge by taking AWS Certifications continues to be recognized throughout the industry, helping to better position them and their company for continued growth. Also, when the university cooperates with AWS Academy, we list four key advantages: (1) Powerful Campus-wide IT Management: On-demand resources help IT teams create stable environments for mission-critical applications, allowing them to concentrate on student success; (2) Significant Return on Cloud-based Big Data: Big data solutions that help predictive analytics, retention initiatives, and student engagement are easy to develop, deploy, and run; (3) Pay for Just What users Need: The AWS pay-as-you-go model eliminates costs. The company should prepare for growth or higher seasonal demand; (4) Faster Time to Study: By making users spend less time building infrastructure and more time on science, the AWS Cloud accelerates research timelines (Soltys et al., 2021).

Educational institutions are crucial for a country's success, especially when it comes to creating innovative technologies, providing good education, producing well-rounded individuals, devising new and effective management strategies, and selecting some of the best minds in the country. University-industry collaboration can be a huge success when enhancing students' skill sets and, consequently, raising their employability. It would also lead to the highest research levels, as industry experts and distinguished academics can work together across multiple disciplines (Goteng, 2019). Most universities welcomed and supported collaboration with tech companies like AWS, Google, Microsoft, and the like. This fast-paced era of artificial intelligence and other businesses using the most recent research to stay ahead, coupled with academic researcher retention being essential for companies and academia, means that companies and academia can take advantage of innovative and flexible new approaches to commercial and research work balance. A new model being investigated is a flexible faculty work schedule for researchers engaged in industrial R&D. In fact, pure research and business interests are increasingly intertwined, requiring us to manage them in a manner that is beneficial to universities and beneficial to the industry as a whole. It is like the universities to work with industry, as well as to form new ventures. With its offerings such as teaching and learning, management of university activities and access to high-performance computing for research projects, AWS has a solution for whatever your ambitions are. Instructors, teachers, researchers, IT staff, and administrators may have computing, storage, and application facilities in the classroom, testing lab, data centre, or elsewhere on campus provided to them rapidly and at a low cost. This paper concludes that collaborating with the industry to design the cloud computing curriculum has strengthened the students' skills and trust. Students have performed well in tests as they understood the practical aspect of cloud computing and are now aware of cloud computing career paths when they graduate. Here, we

attempted to provide a general summary or big picture of the training cloud computing paradigm. In this study, the state of academic-industry partnerships in academia is discussed through an in-depth analysis of the Amazon Academy, a program that assists in a simple and comprehensible manner for the reader to understand the terms and lead to future research on the subject.

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