Chapter 2

Entrepreneurial universities and transformational entrepreneurship: the case of the Zayed University-Minerva Project partnership

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Abstract

This chapter presents a case study of an innovative entrepreneurial university in the UAE: Zayed University's College of Interdisciplinary Studies, established in 2021 in partnership with the US-based Minerva Project. The novel interdisciplinary curriculum aims to equip students – who are predominantly female – with the skills underpinning transformational entrepreneurship through several channels. First, there are no lectures, and active learning classes taught on Minerva's online proprietary platform, Forum, require students to come prepared to class and participate fully. Classes include a variety of in-class exercises (such as polls) and peer breakout groups where students work collaboratively to understand the material. Second, a highly interdisciplinary curriculum trains students in coding, statistics, critical thinking, writing and communication, and the psychology of personal growth as early as their first year. First-year students also take a required course in Entrepreneurship and Innovation. In their second year, students specialize in four interdisciplinary majors: Computational Sciences, Social Innovation, Business Transformation, and Sustainability. Third, as part of the curriculum, all students undertake a Partner Challenge project, where they work in teams and a company mentor to analyze and propose a solution to a company or societal problem. Fourth, students in their third and fourth years undertake a capstone project where they apply their skills to a project of global or national importance. We conclude by analyzing the implications of this new model of an entrepreneurial university for socio-economic change through transformational entrepreneurship in the UAE and beyond.

Keywords: active learning, entrepreneurial universities, Minerva Project, Zayed University, UAE

2.1 Introduction

In this chapter, we study Zayed University and its recently established College of Interdisciplinary Studies (CIS) through the lens of an Emirati entrepreneurial university. Established in 1971, the UAE is one of the world's richest countries, with a 2021 PPP GDP per capita of USD 76,609 (in international dollars), higher than the respective figures for the US and the UK (World Bank, n.d.). Zayed University is one of the UAE's three federal universities (along with UAE University and Higher Colleges of Technology) and was established in 1998. Zayed University is an English-medium university and has a predominantly female student body. The College of Interdisciplinary Studies was established in August 2021 in partnership with the US-based Minerva Project (MP).

Due primarily to the rapid expansion of emerging markets like India and China, researchers and practitioners have been focusing on the role of entrepreneurs. This growth instigated renewed interest in the role that traditional entrepreneurship plays in changing and shaping economic trends in these high-growth markets. In fact, the transformation of emerging economies was primarily attributed to entrepreneurial activity (Schoar, 2010). At the same time, the role of entrepreneurship also evolved, and new models began to emerge. One of the important trends in the evolution of entrepreneurship is the appearance of social entrepreneurs. In contrast to the traditional Schumpeterian view of entrepreneurship, which promotes profit and efficiency goals (Schumpeter, 1934), social entrepreneurship measures its success via different objectives, such as the survival and growth of a social enterprise. Additionally, social entrepreneurs focus more on societal impact than economic impact (Yahchouchy and Dzenopoljac, 2022).

Transformational entrepreneurship is a relatively new concept, bridging the gap between self-employment-based small businesses, high-growth entrepreneurship, and social entrepreneurship. When comparing these, small businesses tend to create low to moderate economic impact, with no focus on societal impact. By contrast, high-growth entrepreneurship is known to create high economic value, but its societal impact tends to be lower, while social entrepreneurs aim to achieve long-term societal impact but with moderate economic impact. Transformational entrepreneurship tries to maximize economic and societal impacts by identifying the root causes of an issue and unlocking human potential through quality interpersonal relationships and knowledge exchange with benefit (Ratten and Jones, 2018). In the same vein, Maas *et al.* (2019, p. 2) define transformational entrepreneurship as a "holistic and heuristic orientation in terms of entrepreneurship promotion and combines the individual and other subsystems (such as society and institutions) interacting and collaborating to create a positive framework in which opportunities can be exploited beyond the local level." Furthermore, according to Ratten (2022), transformational entrepreneurship emerged as a response to society's

need to address crosscutting issues like climate change and societal inequalities effectively. In other words, transformational entrepreneurship represents a special type of entrepreneurship that tries to focus on problems in society and often is initiated through learning and various education programs.

Entrepreneurial universities have emerged as a logical extension and complement of transformational entrepreneurship. Overlapping with The Quintuple Helix innovation model (Carayannis *et al.*, 2012), entrepreneurial universities, as hubs for knowledge creation and dissemination, spur economic development by creating economic growth and increasing employment (Abidi *et al.*, 2021). In this chapter, we explore how and why Zayed University has become an entrepreneurial university and the relevant lessons we can learn from this journey both for the UAE and beyond.

This chapter is structured as follows. In the next section, we outline our conceptual framework, followed by a discussion of the innovative CIS/Minerva teaching and learning philosophy. The discussion on teaching and learning is followed by a focus on the characteristics of the CIS undergraduate program. In the following section, we outline how Zayed University - as an entrepreneurial university - will lead to societal transformation in the UAE, in the region and beyond. We end this chapter with concluding remarks.

2.2 Conceptual framework

The current research utilizes two important conceptual frameworks: transformational entrepreneurship and entrepreneurial universities. As mentioned earlier, the concept of entrepreneurship has evolved from a traditional one, which relies on creative destruction that involves the creation of new ventures by destroying existing structures (Schumpeter, 1934), to a new model of transformational entrepreneurship that goes beyond the old paradigm of economic value creation and tries to tackle global societal issues. Transformational entrepreneurship aims to solve societal problems in creative ways. Furthermore, transformational entrepreneurship has multidimensional and multilevel impacts on society (Dicuonzo *et al.*, 2022). Figure 2.2 compares transformational entrepreneurship to high-growth entrepreneurship, small businesses, and social entrepreneurship on two dimensions: economic impact and long-term societal impact. As the figure shows, transformational entrepreneurship exhibits high economic *and* long-term societal impacts.
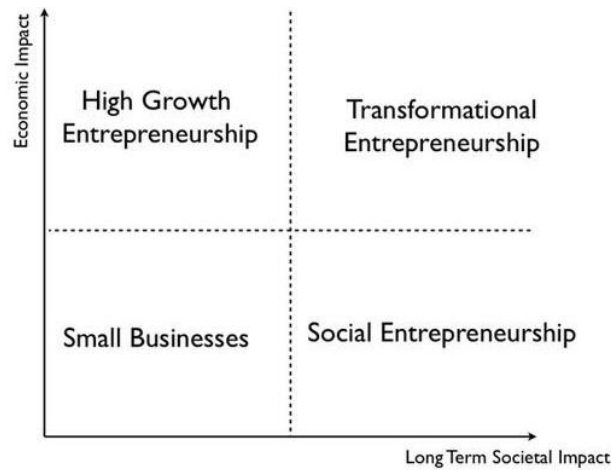
Figure 2.2: A map of socioeconomic value creation (Marmer, 2012)

An entrepreneurial university is a type of university that exhibits the elements of entrepreneurial behavior, by developing its internal capacities to innovate, recognize and create opportunities, take calculated risks, and proactively respond to environmental challenges (Kirby, 2006). This notion represents one specific view of entrepreneurial universities that is more generic and resembles the characteristics of an individual entrepreneur. A broader definition of an entrepreneurial university reads: "*an entrepreneurial university is defined as a university that has the capacity to innovate, recognize and create opportunities, as well as working as a team, taking risks and responding to challenges. By itself, it seeks to discover a substantial change in the organizational character to reach a more promising posture for the future* (Guerrero-Cano *et al.*, 2006, p. 5)." A different literature stream sees entrepreneurial universities as a type of natural incubator in which all the necessary infrastructure is provided to students and professors to engage in new venture creation, whether intellectually or commercially (Etzkowitz, 2003). Our case study fits with the view presented by Kirby (2006), and in the subsequent sections we superimpose the concepts of transformational entrepreneurship and of an entrepreneurial university in the Zayed University/CIS context.

As we discuss in the subsequent sections, Zayed University is undergoing a significant transformation in which all the programs will be developed with interdisciplinarity in mind. This move is a proactive one to provide its students with a learning pedagogy that will better prepare them for the challenges of the future job market. In this sense, there are several important elements of any entrepreneurial university that need to be taken into consideration. These elements include funding, self-reliance, academic freedom, better linkage to industry, innovation, providing employment, and promoting social and economic development (Baporikar, 2022). Furthermore, when compared to traditional and modern universities, entrepreneurial universities stand out in their educational purpose and role in society (Table 2.2).

Table 2.2: The differences between universities (Baporikar, 2022, p. 4)

Nomenclature	Purposes of Education	Role of University
Traditional University	Civic, cultural and economic goals	• Custodian of socio-cultural and national values • Socialization of students • Supply of qualified manpower • Teaching and research
Modern University/ Corporate University	Focus on technical, vocational, and professional education and training	• Applied/action collaborative research in collaboration with industries, NGOs. • Employability of students • Growth and diversification • Promotion of professional education • The separation between teaching and research
Entrepreneurial University	To meet diverse needs	• Adoption of lifelong learning model • Creating science parks, incubators, and industry associations • Encouragement of higher education on a lifelong basis • Promoting academic capitalism and enterprise culture • Putting knowledge into application • Work-ready students

In the Middle East, entrepreneurial universities are seen more as a reactive approach than a proactive one. For example, many universities in the region - such as Middle East College in Oman - quickly adopted the online teaching mode during the COVID-19 pandemic. Other universities in the region, such as the University of Tehran and Sharif University of Technology, have been identified as truly entrepreneurial ones because of their support for entrepreneurial culture, and their attitudes towards developing entrepreneurial initiatives that result in patents, licenses, spin-offs, and various research agreements.

However, the literature has not clearly identified additional examples of entrepreneurial universities in the region. For example, Kawamorita *et al.* (2020) discuss some of the major internal and external challenges faced by entrepreneurial universities in the Middle East, but without stating which universities were analyzed in their qualitative study. Similarly, while Bhayani (2015) analyzes barriers and enablers of entrepreneurship among universities in the United Arab Emirates, all assessed universities are presented

anonymously. Finally, a similar approach was used by Bizri *et al.* (2019), who assessed the hindering factors to establishing entrepreneurial universities in Lebanon. Our case study of Zayed University as an entrepreneurial university is, to the best of our knowledge, the first in-depth analysis of an entrepreneurial university in the Middle East. While a large literature does look at entrepreneurial universities in the US and Europe, the conclusions from this work are not necessarily applicable to the UAE and the Middle East due to the different cultural, economic, social, and political factors at play.

2.3 The College of Interdisciplinary Studies (CIS)/Minerva teaching and learning philosophy

Universities cannot remain unchanged if they are to foster an entrepreneurial culture and teach young people how to think and act like entrepreneurs. Instead, they need to be innovative and entrepreneurial in their main functions, which include teaching and learning (European Commission & OECD, 2012). CIS has become a regional leader in educational innovation by implementing Minerva's innovative and fully active learning pedagogy and skills-focused curriculum. Active learning has been shown to outperform traditional lectures across multiple disciplines and student populations (Freeman et al., 2014; Yannier et al., 2021). Active learning is effective because it is grounded in the science of learning (Kosslyn, 2017), and Minerva is the only institution to systematically apply the science of learning principles to all aspects of the curriculum and its implementation.

Active learning contrasts with "traditional" teaching methods, in which students passively receive information from the instructor. At CIS, every class is designed to include active learning exercises to encourage student participation in the learning process and student engagement with the course content. Further, active learning is combined with the flipped classroom approach in order to maximize the use of class time (Cole & Kritzer, 2009) and reduce the cognitive load during class by allowing students to process foundational information prior to class (Roehling & Bredow, 2021). Reading assignments or watching recorded lectures are common ways for instructors to introduce new concepts to students before a scheduled class meeting. Students then put this knowledge and these skills to use in the classroom through activities that have been designed based on the principles of the science of learning. The goal of these activities is to ensure that the students apply their knowledge and skills in the most effective ways possible to meet the learning goals. For example, students may take part in debates or role plays that require more mental processing than simply processing the surface properties of the content. Cognitive science has shown that the more mental processing an individual performs on information, the greater the likelihood that they will retain it (Kosslyn, 2017). Alternatively, a writing or discussion activity will require them to make various associations between the

new information and what they already know to improve both the retention of the new knowledge and skills and their retrieval when they are needed (Kosslyn, 2017). Minerva's online platform Forum equips instructors with effective tools for conducting lessons in a fully active learning format by means of features such as multiple poll formats, breakout sessions for small group work, emoji reactions, and TalkTime, which provides a real-time view of how much students are participating.

Given the ease with which information can be obtained in today's world, the MP curriculum places less of an emphasis on content memorization and a greater emphasis on the durable skills necessary for readiness and success in the workforce, as well as for innovation, entrepreneurship, and lifelong learning. Skills are considered durable if they can be applied across domains and contexts and continue to be useful despite technological and industry-specific developments (Herget & El-Azar, 2023). The ability to communicate, think critically and creatively, collaborate effectively, and solve problems are all examples of durable skills and are considered crucial for cultivating entrepreneurial attitudes (Baporikar, 2022). These skills are broken down into a set of outcomes that can be taught and measured, and these outcomes are integrated into the learning objectives of the Minerva curriculum (Herget & El-Azar, 2023). Learning objectives are structured in a hierarchical manner and integrated into courses across majors and years to allow for skill development that is scaffolded and to facilitate transfer to other fields of study. Following initial exposure to the skills in general education courses, the MP multidisciplinary curriculum enables students to apply these durable skills in many domains and contexts as they pursue their chosen majors.

At CIS, assessment is distinct and aligned with the explicit focus on skills (Herget & El-Azar, 2023). Students in the CIS program receive feedback and grades on multiple learning objectives for each assignment, in contrast to conventional grading practices in which students receive a single grade for any given assignment. Formative and summative assessments are used in each class to evaluate students on how well they are able to apply the objectives. Formative assessments are frequent and low-stakes and include classroom activities such as polls and oral contributions, as well as small-scale homework assignments that may serve as a steppingstone to a summative assessment. Students are provided with frequent and individualized feedback on learning objectives in accordance with the principles of deliberate practice (Kosslyn, 2017), which enables them to identify the areas in which they are having the most difficulty and improve their abilities accordingly. During the course of a student's education, all of the grades on a specific learning objective are accumulated to produce an evaluation of the student's performance on that objective across a variety of domains and contexts.

2.4 The content of the CIS innovative undergraduate program

Through active learning, the CIS program aims to develop life-long learners who excel in six main areas: (1) critical thinking and quantitative reasoning; (2) global awareness; (3) information literacy; (4) language; (5) leadership; and (6) technological literacy (Zayed University, n.d.). Moreover, the program is truly interdisciplinary and cross-cultural, which helps prepare students for the fast-changing job market. For instance, using data from 28 OECD countries, Cyprus, and Singapore, Brussevich et al. (2018) show that in the next two decades, 26 million male jobs and 28 million female jobs are at risk of automation and extrapolate that, globally, 180 million female jobs are likely to disappear. Rather than becoming proficient in only one area or major, as in traditional universities, students acquire an interdisciplinary foundation first, on which they build their disciplinary knowledge. The CIS program equips its mostly female students with diverse and transferable skills that can make them resilient to job automation and change, and that can serve them well in anything they undertake after graduation.

The general education program is the backbone of the innovative CIS program. It has five broad learning outcomes: thinking critically, thinking creatively, communicating effectively (in both English and Arabic), interacting effectively, and global awareness. To achieve these learning outcomes, all first-year students take the same classes during their first two semesters, regardless of major. During their first semester, students develop proficiency in coding, creative and logical thinking, writing, and the skills for life-long learning by taking classes on Applied Algorithmic Thinking, Applied Creative and Critical Thinking, Expressive Clarity, and Strategic Learning and Growth. During their second semester, students hone these skills by taking courses in Statistical Intuitions and Applications, Critique and Communication, Systems and Society, along with a course on the Fundamentals of Innovation and Entrepreneurship. While students start specializing in their majors in their second year, they still take two general educational courses: Deriving Insights from Evidence (during their third semester, where students learn about using different types of data and quantitative research methods in the natural/social sciences) and Ethical Systems and Moral Dilemmas (during their fourth semester, where students cover topics such as voting, effective altruism, food ethics, healthcare, education, poverty, and disability) (Zayed University, n.d.).

All general education courses include two weekly active learning sessions taught on the Minerva active-learning online Forum platform, along with one weekly in-person session where students work with their peers to practice concepts from the active learning sessions. Students are also required to take an Arabic class (designed for either native speakers or beginners). An important difference between CIS and traditional universities is that at CIS there are no exams. Assessments involve student answers on in-class

activities, such as polls, and their verbal contributions, along with three or more take-home assignments that require students to solve a particular problem or a set of problems using the critical thinking skills they have developed in the course.

In the third and fourth years, students focus on courses for their majors, building on the skills developed in the general education program. The CIS program offers four majors that are centered around solving real-world challenges: Business Transformation (with specializations in Finance, Accounting, Operations Management, Growth Strategy and Management, and Entrepreneurship and Innovation), Computational Systems (with concentrations in Applied Data Science, Machine Intelligence, and Digital Security, Social Innovation (with concentrations in Communication and Media, Psychology, Behavioral Economics, Political and Economic Systems, and Societal Transformation), and Sustainability (with concentrations in Sustainable Enterprise, Sustainable Policy, and Sustainable Environments). Once again, rather than siloing student learning, major courses create connections to multiple disciplines in order to prepare students for the real world. All students complete an internship (in their final semester) and a capstone project, with a capstone seminar completed in semester 6, and the capstone project completed in semesters 7 and 8.

As noted by Dicuonzo et al. (2022), transformational entrepreneurship incorporates the ability of entrepreneurs to face various global challenges, with the main aim of improving the well-being of the community that they are a part of. In this regard, the innovative and unique Partner Challenge program within CIS enables students to put what they have learned into action and become more agile in a dynamic contemporary environment. From their first semester, students have the opportunity to work alongside 90+ local and international companies to gain valuable real-world experience. In consultation with a company mentor, students work in teams on a problem identified by the organization and design a solution. The students' work is then reviewed by the mentor and is part of assignments for general education courses, such as Applied Creative and Critical Thinking and Critique and Communication. The problems on which the students work require teamwork, organization, and creative thinking. Some examples of problems covered in previous challenges include: "How might we design an environmentally sustainable home in Dubai?"; "How might we use AI to diagnose learning difficulties?" and "How might we understand how banks can leverage technological disruption to their advantage?" (Zayed University, 2022).

In line with the notion put forward by Maas et al. (2019), where transformational entrepreneurship aims at researching and envisioning better ways to approach solving current and future challenges, the Partner Challenge program within CIS achieves this very goal. When students work on the analysis and implementation plans for the partner

companies, they are encouraged to propose creative and holistic solutions to existing problems and to try to anticipate future ones. Figure 2.4 illustrates the growth of the Partner Challenge program. Most organizations involved in the program are from the private sector (80.6%), while non-profit organizations comprise 10.2% and government entities 9.2%, respectively. Mentors come mostly from large enterprises, followed by start-ups and then by small and medium-sized enterprises.
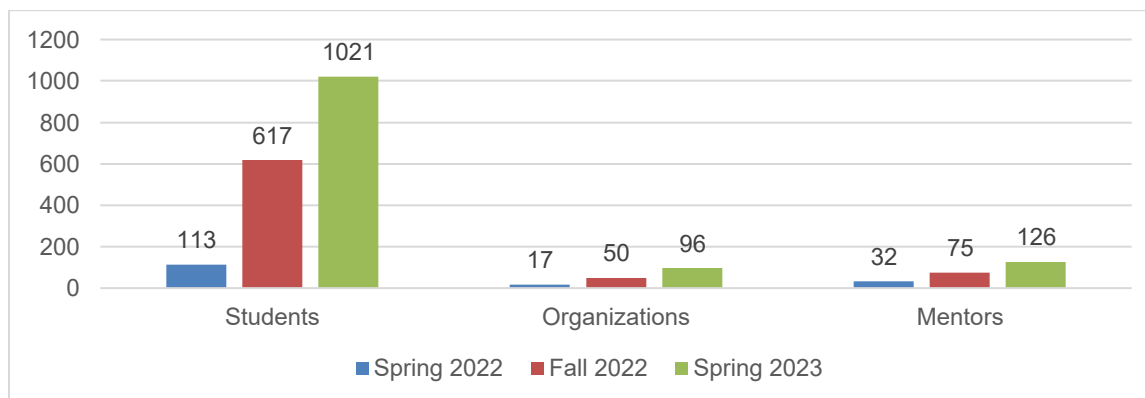
Figure 2.4: Growth of the Partner Challenge program (source: Zayed University data)

The combination of an interdisciplinary curriculum and real-world experience aims to prepare students for the rapidly changing labor market in the UAE and beyond, and to make ZU graduates competitive for private sector jobs where Emiratis are underrepresented. Since the private sector is projected to fuel growth in the UAE in the next 50 years, CIS and Zayed University have an important role to play in training graduates to be part of this growth trajectory (The National, 2023).

Finally, while the student body at Zayed University and at CIS remains predominantly female, all CIS classes and projects (both in-person and online) are co-educational. Co-educational programs allow both female and male students to learn to work with diverse colleagues and to consider the preferences of diverse audiences. In addition, the approach allows female students to expand their networks, which is an important requirement for being successful in the UAE labor market and in entrepreneurship (Tahir and Baradie, 2019). Co-education could also help shift societal perceptions towards women, both among women and men. In Zambia, a qualitative study by Evans (2014) shows that in mixed-gender classrooms, students rejected the stereotype of men being more intelligent, due to observing female students who excelled at mastering the material. Girls who attended co-educational schools also reported being more confident and being able to stand up for themselves, which was helpful for dealing with male-dominated workplaces in the end. Likewise, Arnot et al. (2012) find that in India and Ghana, co-

educational environments were responsible for improving patterns of communication between boys and girls and gender attitudes.

2.5 How CIS and Zayed will encourage societal transformation in the UAE and beyond

Societal transformation is at the heart of the UAE Centennial Plan 2071, which has the ambition to keep pace with the rapid changes in the world by investing in future generations to equip them with the knowledge and skills they need to cope with and lead these changes. The pillars of the plan include a future focused government, excellent education, a diversified knowledge economy, and a happy and cohesive society. The plan also involves diversifying non-oil imports and exports, investing in advanced technology-based education, raising productivity, and enhancing social cohesion (UAE, n.d.). Zayed University's latest strategy (from February 2023) is fully in line with the UAE Centennial Plan 2071. The main pillars of the strategy are interdisciplinary education, interdisciplinary research, value-added partnerships, and lean operations. The interdisciplinary education focuses on knowledge and skill application, interdisciplinary research that is outward-looking and value-added partnerships (Zayed University, 2023).

According to Klofsten *et al.* (2019), entrepreneurial universities should emphasize teaching, which needs to be empowering, experiential, cooperative, as well as reflective in order to adequately develop the mindsets ready for future challenges. As discussed in the previous sections, Zayed University and its College of Interdisciplinary Studies foster an active approach to learning. Faculty members serve as guides who enable creative and critical thinking in students. Students are encouraged to come up with their own ideas and draw their own conclusions based on all available knowledge, and not just learn and repeat information that is explained in traditional textbook-focused classes. Furthermore, Zayed University is moving away from the traditional view of an entrepreneurial university having solely an economic contribution by also focusing on societal impacts, thus making it a truly sustainable entrepreneurial university (Cai and Ahmad, 2023; Etzkowitz *et al.*, 2022). In addition, by offering distinct programs like Business Transformation, Social Innovation, Computational Systems, and Sustainability, Zayed University focuses on tackling the key societal issues in the UAE as well as globally. By graduating students from these distinct programs and nurturing their problem-solving skills, along with critical thinking and creativity, the University aims to transform the UAE society for the better. In this way, Zayed University will follow the logic and elements of the Quintuple Helix model that brings together university, industry, government, civil society, and aspects of the natural environment (Carayannis *et al.*, 2012).

Among the UAE government's highest priorities is the employment of UAE nationals. Historically, most Emiratis have found work in the public sector, but the country's rapid population growth has outpaced the government's ability to add new positions. Accordingly, the government began a nationwide drive to increase the number of Emiratis working in the private sector by mandating that businesses employ a greater proportion of nationals (UAE Government, 2023). Businesses, on the other hand, have difficulty finding qualified candidates, especially for managerial and professional positions, highlighting the importance of educating Emirati students to fulfill the demands of the UAE job market (Al-Qubaisi, 2012). With its interdisciplinary majors, emphasis on durable skills, and active learning methodology, CIS has the potential to produce Emirati graduates who fulfill the needs of the private sector.

Recognizing the importance of entrepreneurship for a dynamic economy, the UAE government offers incentives to encourage Emiratis to enter the fields of investment and private enterprise. Emirati entrepreneurs play a major role in increasing the contribution of non-oil industries to the country's gross domestic product and building an economic structure centered on entrepreneurship, innovation, and production (Department of Government Support, 2023). Entrepreneurs generate employment opportunities not only for themselves, but also for others. Yet, if the nationals lack the skills necessary for employment in current enterprises, it will certainly be even more challenging for them to form their own businesses.

Further, the number of female entrepreneurs in the UAE is significantly lower than the number of male entrepreneurs (Kargwell, 2012). In addition, female Emirati entrepreneurs are concentrated in the retail and fashion industries, whereas male Emirati entrepreneurs engage in a wide range of industries (Kargwell, 2012). One possible explanation is the continued underrepresentation of women in STEM education and careers (UNESCO, 2021). As a result, women are less likely than men to launch STEM-related businesses. CIS's interdisciplinary approach exposes both male and female students, regardless of their chosen major, to STEM fields. For example, students begin coding in their first semester and continue to do so in subsequent semesters. Thus, we anticipate that the interdisciplinary education students receive will expand their career opportunities, particularly for female students.

To complete its transformation into an entrepreneurial university, Zayed University has made use of several governance structures and processes. For instance, it established a Transformation Office, which has been responsible for leading the change, along with the Office of the Provost. The Transformation Office is also tasked with implementing Zayed University's new strategy (2023-2026), which is tightly linked to transformational entrepreneurship. The strategy explicitly refers to the UAE's 2071 Centennial Plan, which

aims for educational institutions to become incubators of entrepreneurship and innovation as well as international research centers. More precisely, Zayed University's mission specifically references societal change through "lifelong learning that exceeds expectations and meets the needs of society to achieve sustainable development". The strategy further clarifies that the university's emphasis on interdisciplinary education and research, partnerships, and operational excellence will produce successful employees and *entrepreneurs* who can think outside the box and be prepared for the rapidly changing world (Zayed University 2023, emphasis added).

Finally, the approach fostered by the College of Interdisciplinary Studies realizes the impact that transformational leadership has on organizational performance (Kenneth, 2019), which is more impactful compared to the impact of a transactional leadership style. At CIS, the transformational leadership style is recognized as a crucial enabler of transformational entrepreneurship. This connection represents an important aspect of attaining the synergy between the two approaches and maximizing the transformational potential that will have a long-lasting impact on society (Chitac and Agheorghiesei, 2023). Transformational leadership focuses on intellectual stimulation, in which followers are encouraged to solve problems in creative ways (Daft, 2018). This leadership style represents the best fit with Zayed University's approach. Combining the aspects of intellectual stimulation with the elements of the Partner Challenge program and a novel educational perspective enables the creation of transformational entrepreneurs as well as transformational leaders and effective followers needed for tackling contemporary challenges.

2.6 Conclusion

This chapter explores how and why Zayed University and its College of Interdisciplinary Studies embody the notion of an entrepreneurial university. Through its partnership with the Minerva Project, Zayed University has established an innovative teaching and learning environment for undergraduate students that will spur societal transformation in the UAE and beyond. By doing so, Zayed University has shown a capacity to innovate, create opportunities, take risks, and respond to societal challenges.

Once the first cohort of CIS students graduates in 2025, more data will become available on the link between the CIS program and transformational entrepreneurship. Zayed University's CIS program will therfore support transformative entrepreneurship among students by providing them with a unique educational experience that integrates interdisciplinary learning, active involvement, durable skill development, and real-world application. The approach equips students with the skills and mindset necessary to think

critically, innovate, and create positive change in the rapidly evolving business landscape as well as the complex social and environmental challenges that surround them.

By emphasizing interdisciplinary education within the curriculum and instruction and empowering the faculty to implement it, CIS prepares students to address complex real-world challenges from multiple perspectives. This interdisciplinary approach encourages students to think creatively, make connections across disciplines, and develop a holistic understanding of the business landscape. Moreover, the interdisciplinary nature of the CIS program extends beyond traditional business boundaries to encompass societal entrepreneurship. Students learn about the interconnectedness of business, society, and the environment and the significance of developing innovative solutions that generate positive social change. By integrating social and environmental considerations into their entrepreneurial endeavors, students are equipped to become agents of societal transformation and address pressing global challenges.

For instance, through their active learning experiences at Zayed University, students have already acquired the necessary knowledge and skills to participate in events like the UN-sponsored COP27, where CIS had several student groups in attendance. The emphasis on critical thinking enables students to analyze complex issues such as climate change and propose creative solutions. The development of effective communication skills empowers students to engage in international youth dialogue and express their ideas persuasively. Moreover, research proficiency equips them with the ability to navigate and understand global climate action frameworks. Furthermore, the focus on collaboration and teamwork at the university fosters an environment where students are encouraged to work together towards common goals. This prepares them for the collaborative nature of international conferences, where they can engage with peers from diverse backgrounds and countries.

Our work has important implications for traditional or modern universities that might want to become entrepreneurial ones. First, an openness to implementing new ideas and approaches to learning and teaching - such as Minerva's pioneering approach - is essential. If a university wants to innovate, it cannot really do so by just tweaking existing ineffective pedagogical approaches, such as lecturing. Second, interdisciplinary is key for preparing students for opportunities in the labor market and for encouraging societal transformation. While tackling global challenges such as gender inequality, climate change, poverty, and violence requires a truly interdisciplinary perspective, at traditional universities teaching and learning is usually separated in tight disciplinary boundaries, which academics rarely overcome. At CIS, the general education program is a true interdisciplinary foundation on which students build their disciplinary knowledge, and which enables them to look at problems through multiple and diverse perspectives. Third,

connecting academic knowledge to the real world by collaborating with companies from the students' first semester is important for teaching students the importance of teamwork and critical thinking, skills that are essential in the workplace and beyond.

At the same time, it is important to acknowledge that the case of the Zayed University-Minerva Project partnership may have limited external validity for other world regions. Investing in a groundbreaking technology-driven pedagogy requires extensive financial resources, which many universities - particularly in resource-poor settings (Hang'andu *et al.* 2022) - may find difficult to obtain. The success of any kind of new program requires buy-in from the university administration and students alike, which once again might be a challenge for traditional universities where changing the status quo is difficult. In addition, first-year students who have never experienced active learning or a flipped classroom might find it hard to get used to the new model of learning. Explaining to students how active learning works through collaborative sessions prior to the start of regular classes is an approach that has worked well in the CIS context. In addition, emphasizing the importance of active learning and of completing pre-class work, along with providing students with support options (such as university tutors and instructor office hours), can also help students transition to being active (and thus life-long) learners. Similarly, continuously training instructors in active learning techniques and discouraging them from using lecturing when course material might be challenging is essential.

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