Closing the Gap Between Students' Career Readiness and Employers' Expectations:
An Innovative Competency-Based Approach

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ABSTRACT

This article describes one aspect of Florida International University's (FIU) response to the changing landscape of higher education and the ever-evolving world of work. The following case study highlights how strategic planning grounded in comprehensive planning and evaluation processes led to the development of an innovative and agile quality enhancement plan that aims to enhance students' preparation for the 21st-century workforce by certifying students' attainment of critical competencies related to artificial intelligence, data interpretation, and emotional intelligence. Utilizing a faculty-driven approach, FIU was successful in leveraging a required institutional effectiveness accreditation process to develop and implement a university-wide strategic initiative that focuses on student learning outcomes that close the gap between students' career readiness and employers' expectations.

INTRODUCTION

The growth of the digital economy has impacted the work environment, presenting numerous challenges to higher education. Alternative education providers, the spread of digital communities, social media, do-it-yourself learning, and the global coronavirus pandemic have reshaped many aspects of modern life, including the traditional model of higher education. Artificial intelligence, machine

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learning, robotics, and advanced technology are poised to permanently alter the nature of work. New graduates will enter a workforce where machines process data, perform technological functions, and compute scientific calculations more efficiently and accurately than humans.

Cognizant of the impact of the digital economy on the work environment, higher education institutional systems must employ flexibility, diversity, and agility to meet learners' needs. Institutions of higher education are obligated to engage in ongoing, comprehensive, integrated, and institution-wide research-based planning and evaluation processes that focus on (1) educational quality and effectiveness; (2) learner needs to ensure employment readiness, post-graduation success, and workforce and industry advancement; and (3) a systematic review of institutional goals and outcomes consistent with its mission.

This article describes a case study illustrating one aspect of Florida International University's response to the changing landscape of higher education and the ever-evolving world of work. The case study highlights how strategic planning grounded in comprehensive planning and evaluation processes led to the development of an innovative and agile quality enhancement plan that stimulates and facilitates learning and includes the certification of critical competencies such as analytic, interpersonal, global, and professional skills as well as technological and data literacies. Born from the strategic planning process and following expectations of the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) institutional accreditation requirements, the quality enhancement plan, entitled *Critical Skills for the 21st Century*, focuses on amplifying learner success and aligning curriculum with the knowledge, skills, abilities, and values required for success in the workplace.

LITERATURE REVIEW

Strategic Planning in Higher Education

Strategic planning in higher education emerged in the 1970s and 1980s in response to fluctuating enrollment, changing student demographics, and funding inconsistencies (Hinton, 2012). According to Hinton (2012), the data-driven strategic planning process arose as a proactive solution for maneuvering in a rapidly changing environment with declining resources. Initially, strategic planning in higher education was used to articulate the institutional mission and vision, prioritize resource allocation, and promote organizational focus. As institutions of higher education began to engage in strategic planning, federal and state governments, along with accrediting agencies, developed standards for assessment and learning outcomes measures in response to external demands for accountability. Institutions of higher education were required to have a strategic plan and an assessment plan to satisfy accreditation requirements by the 1990s (Hinton, 2012). During this same time, federal and state governments began tying funding and regulatory oversight to accountability measures, making the planning process more data-driven.

Accreditation Requirements

The SACSCOC, an institutional accreditor recognized by the United States Department of Education, has core requirements related to strategic planning (Section 7: Institutional Planning and Effectiveness) and assessment of learning outcomes (Section 8: Student Achievement) (Commission on Colleges, 2017). The SACSCOC requires institutions of higher education to demonstrate a commitment to continuous improvement based on a systematic, research-based process that continuously examines institutional performance and student achievement. This process is expected to inform decision-making at all levels, such as budgetary decisions and decisions impacting students' educational experiences and learning outcomes (Commission on Colleges, 2017). The SACSCOC established the Quality Enhancement Plan (QEP) as a requirement of the reaffirmation of accreditation review process. An institution must identify a QEP topic through its ongoing, comprehensive planning and evaluation

process (i.e., strategic planning process); garner broad-based support from stakeholders; develop a 5-year plan that focuses on improving student learning outcomes and/or student success; commit resources to implement and complete the plan; and assess the extent to which the plan achieved established outcomes. Ultimately, through the QEP, an institution develops, implements, and assesses the impact of an intervention to enhance student success (e.g., career or workforce readiness).

Learner Readiness for the 21st-Century Workforce

The National Association of Colleges and Employers (NACE) defines career readiness as the attainment and demonstration of requisite competencies that broadly prepare college graduates for a successful transition into the workplace (National Association of Colleges and Employers, 2022). According to surveyed students and families, the most cited reason for enrolling in higher education is to improve the student's job prospects (Gallup, 2017). Given the expectation that workplace skills are acquired through a college education, promoting a student's career readiness is of utmost importance to institutions of higher education and would-be employers (National Association of Colleges and Employers, 2022).

Employability skills include core discipline and soft skills used daily (Stokes, 2015). Core, hard skills include the technical competencies that align with specific job functions (Hora, 2016), and soft skills comprise the personal and social competencies that determine how one manages self and relationships (i.e., emotional intelligence) (Goleman, 1998). The World Economic Forum reports that demand for both digital and human factors is driving growth in the professions of the future: jobs for artificial intelligence specialists and data scientists are predicted to experience the most growth in the coming decades; skills in highest demand are predicted to include technical and soft, cross-functional skills (e.g., emotional intelligence) (Ratcheva et al., 2020).

Research suggests that acquiring 21st-century skills, the broad range of skill sets and competencies currently deemed necessary (Vista, 2020), predicts academic and workplace success (Almlund et al., 2011). More specifically, the literature defines these core skills as the combination of cognitive, interpersonal (i.e., social), and intrapersonal (i.e., emotional and self-regulatory) skills that are malleable and relatively stable over time in the absence of exogenous forces and are transferable across jobs (Duckworth & Yeager, 2015; National Research Council, 2012; National Association of Colleges and Employers, 2022).

However, employers report that recent college graduates entering the workforce lack these 21st-century skills (Goodman et al., 2015). Fewer than half of Americans (43 percent) agree that college graduates are well-prepared for success in the workplace (National Association of Colleges and Employers, 2022), and 89 percent agree that higher education institutions need to change to better serve the needs of today's students (Gallup, 2014). Additionally, although 96 percent of chief academic officers believe their institutions are "somewhat" or "very effective" in preparing students for the workforce, only 11 percent of employers agree (Gallup, 2014). A need exists for graduating students to develop the skills required for 21st-century work (Rios et al., 2020).

Learners, too, seem to understand the importance of developing these skills. According to a 2017 Strada-Gallup College Student Survey (2017), only a third of students believe they will graduate with the skills and knowledge to be successful in the job market (34 percent) and in the workplace (36 percent). In fall 2019, FIU administered a survey to currently enrolled students, the results of which affirm these data; of the FIU students surveyed (n=778), only 32 percent of respondents "agreed" or "strongly agreed" with the statement: "I have the required professional skill set for my desired job post-graduation." FIU student respondents indicated an interest in developing competency in various areas, most frequently in these five: oral communication (62 percent); problem-solving (60 percent); critical thinking (57 percent); foundational technical skills (e.g., cybersecurity, artificial intelligence, data, analytics) (55 percent); and entrepreneurship (49 percent). In the spring of 2020, FIU also surveyed alums who graduated between 2015 and 2019. Of those surveyed (n=312), 86.6 percent indicated an interest in enrolling in short-term courses, such as micro-credentials, to upskill or reskill.

A college transcript summarizes a student's academic performance by listing courses, grades, credit hours, and other academic information as evidence of satisfying degree requirements. The value of the college transcript alone is decreasing; transcripts list courses and not skills, and employers question its usefulness in hiring decisions (Gauthier, 2020). Education consumers value courses aligned with work and day-to-day life and pathways linked to careers (Gallup, 2019). Employers, seeking to better understand an applicant's knowledge, skills, and abilities before extending an offer of employment, increasingly use competency-based hiring practices. Most business leaders (71 percent) would consider hiring an applicant who does not have a post-secondary degree or credential but can demonstrate evidence of knowledge and skills during hiring (Gallup, 2014). Therefore, it is not surprising that 92 percent of FIU alums (n=291) and 87 percent of students (n=773) feel it is essential to be able to document professional skills outside of a traditional resume or academic transcript. Micro-credentialing is a mechanism to articulate the competencies gained in an educational program and augment the college transcript to articulate cognitive processes and practical knowledge acquisition (Gauthier, 2020).

Micro-credentials offer a compelling response to the trends discussed above. A mechanism to articulate the competencies gained in an educational program, micro-credentialing allows students to document hard and soft skills on their transcripts (Gauthier, 2020). Additionally, micro-credentials can offer engagement opportunities for nontraditional, commuter, or online learners when offered as part of a co-curricular program.

METHODS

This section will describe how FIU (1) developed its QEP topic through the university's strategic planning process, (2) implemented a career-ready strategic initiative to certify learners' attainment of knowledge, skills, abilities, and values in 21st-century critical skills, and (3) assessed the outcomes of the career-ready strategic initiative through pilot testing prior to university-wide implementation. Pilot data will be presented and discussed.

Strategic Planning

FIU engages in a comprehensive, research-based strategic planning process every five years. Soliciting feedback from the university community and other stakeholders, the recent strategic planning process included dialogue concerning the role of higher education in the rapidly changing, 21st-century world of work. Dialogue also focused on the institution's unique ability to provide learners with opportunities for preeminent intellectual engagement, upward social mobility, and improved lives. University leaders sought to garner insight from internal and external stakeholders. The president and provost hosted webinars and led numerous town halls and meetings with various groups, including the Student Government Association, Faculty Senate, Board of Trustees, and President's Leadership Program and Chairs Advisory Council members.

Approximately 200 faculty and staff members, students, and alums served on thirteen workgroups charged with engaging in dialogue, debating and analyzing the best-available evidence, and developing recommendations for university and student success in the 21st century. Each recommendation from the workgroups included (1) a description of, or justification for, proposed strategic initiatives supported by data, research, or best practices; (2) defined, targeted metrics; (3) a feasibility assessment considering timelines for implementation and projected costs or savings; and (4) an accountability plan with measurable goals and proposed benchmarks. These workgroups produced approximately 70 recommendations supported by research or best practices.

One strategic planning workgroup provided four recommendations to enhance the learner experience and certify workforce competencies. Within this four-part recommendation, the workgroup identified a "skills gap" between the skills employers seek and recent graduates possess. The workgroup identified core competencies required to foster 21st-century, employment-ready graduates based on

available research and literature. The core competencies identified were compassion, empathy, and emotional intelligence; data collection, analysis, and synthesis; and artificial intelligence and machine learning. Workgroups additionally proposed methods for certifying critical competencies.

Using the recommendations from the workgroups and feedback obtained from internal and external stakeholders, the Strategic Plan Steering Committee engaged in a prioritization exercise to build consensus on the framework and themes of the strategic plan. Constituents from across the university community were involved in the planning process, garnering broad-based input and support for strategic goals and outcomes consistent with the institutional mission while remaining focused on continuous improvement in institutional quality and effectiveness, student learning, and student success. University leadership engaged in continuous conversations with institutional constituencies, prioritizing broad-based involvement by faculty, students, alums, staff, and community members. Faculty members were provided numerous opportunities to offer feedback, including discussion during Faculty Senate meetings. Faculty members posed questions and engaged in dialogue about badging, micro-credentialing, and the importance of technology in modifying the work environment and industry expenditures. Out of this strategic planning process and following SACSCOC institutional accreditation requirements, the university identified the QEP topic – *Critical Skills for the 21st Century* – focusing on amplifying learner success and aligning curriculum with the knowledge, skills, abilities, and values required for success in the workplace.

Implementation of a Career Readiness Strategic Initiative

The aim of the QEP career readiness strategic initiative is to enhance students' preparation for the 21st-century workforce by certifying students' attainment of knowledge, skills, abilities, and values related to artificial intelligence (AI), data interpretation, and emotional intelligence (EI); this plan seeks to close the gap between students' career readiness and employers' expectations in these areas. This QEP was led by a 13-member Development Committee of subject-matter experts in artificial intelligence (AI), data science, emotional intelligence (EI), pedagogy, assessment, and micro-credentialing.

This committee garnered feedback from stakeholders, including students, potential employers, and other university constituents (e.g., directors, deans, assistant/associate vice presidents, vice presidents, provost, and members of the president's executive council) throughout the implementation process to inform the development of a meaningful educational intervention to meet the needs of learners' and employers alike. Committee members identified foundational AI, data interpretation, and emotional intelligence EI competencies required for success in the 21st-century workforce; defined expected student learning outcomes; addressed feasibility and faculty buy-in considerations; and developed methodologies for delivering content, collecting data, and assessing student achievement. Furthermore, the committee identified the target learner population; discussed the scope and mode of delivery for the educational content; developed techniques for assessing knowledge, skills, abilities, and values; and considered meaningful ways to facilitate the communication and verification of competencies with potential employers.

Institutional Infrastructure in Support of Career Readiness

As part of the university's strategic goal to prepare students for careers or post-graduate study, FIU established an Office of Micro-Credentials and an institutional policy regarding developing and issuing micro-credentials. To provide the infrastructure needed to implement this strategy and achieve the institution's strategic plan goal, the office is supported centrally through the Division of Academic and Student Affairs. Administrators and staff in the Office of Micro-Credentials assist faculty and staff with the micro-credential proposal process, coordinate instructional design support, and centrally award micro-credentials.

Micro-credentials offered by the institution are designed to document learner achievement in competencies needed for post-graduate success, reskilling, or upskilling that are deemed valuable by potential employers. Educational content is designed to complement existing university courses

and programs or as stand-alone learning units that will aid the learners' (students and workers alike) development of technical and soft skills required for their careers or post-graduate studies. FIU micro-credentials are competency-based; learners must demonstrate specified knowledge, skills, and abilities at an appropriate level of rigor and in alignment with best practices for assessing success in achieving student learning outcomes and program outcomes. All micro-credentials must have a culminating reflective experience requiring learners to reflect on the educational experience and how competencies align with their personal and professional growth. Qualified faculty members and subject-matter experts evaluate artifacts, assess student learning, and measure the extent to which competencies are met.

Micro-credentials are a competency-based form of knowledge and skill validation that are awarded in the form of digital badges. A digital badge is a type of micro-credential guided by a competency statement linked to student learning outcomes that can be assessed; a digital badge is issued once competencies are met. The institution uses a third-party vendor platform to issue students' digital badges upon successfully completing the micro-credential requirements. Once issued, a student logs in to or creates an account to claim the earned digital badge. Once the digital badge is claimed, it can be shared on LinkedIn profiles and other professional social media platforms. In addition, students may embed digital badges in resumes or e-mail signatures.

Micro-Credential Framework

Under the institutional policy regarding developing and issuing micro-credentials, the 13-member Development Committee built consensus on a framework to develop and implement QEP micro-credentials covering the basic concepts of AI, data interpretation, and EI (Table 1). These foundational-level micro-credentials are intended for learners ranging from lower-division (i.e., first-time-in-college) to upper-division (i.e., juniors, seniors) undergraduate students majoring in subject areas unrelated to AI, data science, or EI. By completing these micro-credentials, undergraduate students can document competency in foundational concepts of AI, data interpretation, and EI.

The committee assessed the feasibility of integrating these micro-credentials into academic programs with varying requirements. To allow flexibility in integrating micro-credentials, the committee decided this content should be offered through synchronous curricular and asynchronous co-curricular delivery modes. Through synchronous curricular offerings, faculty members could embed micro-credentials into existing courses. Through asynchronous co-curricular offerings, trained faculty or subject-matter experts may facilitate the online delivery of a stand-alone, non-credit micro-credential at no additional cost to students. This process allows learners to gain competency in AI, data interpretation, or EI outside the requirements of their chosen academic programs.

Table 1. Quality enhancement plan micro-credentials and foundational student learning outcomes

Micro-credential	Foundational Student Learning Outcomes
Artificial Intelligence: How It Works and Its Impact	Prepares students to comprehend and appreciate the nature of AI, its history, how it works, and its impact. Students will be able to describe basic concepts related to AI, several core techniques, and how AI will likely advance.
Thinking and Communicating with Data	Prepares students to interpret data trends and communicate ideas and analyses supported by the evidence. Students will learn to summarize, visualize, and interpret data analytics, and will learn to prepare presentations and narratives with analytics while being sensitive to societal issues related to data privacy, security, and ethics.
Understanding Emotional Intelligence	Prepares students to understand EI concepts related to personal and social awareness, self-management, and relationship management. Students will learn strategies to recognize and manage emotions, identify negative beliefs and self-talk, listen empathetically, and better manage relationships.

The committee determined that 16 to 20 hours of educational content per micro-credential would allow for learner attainment of the foundational student learning outcomes while offering faculty opportunities to incorporate a micro-credential into an existing course or course series that may be included in the core curriculum or an academic program. The committee also speculated that interested students could accommodate the 16- to 20-hour time commitment necessary to complete an asynchronous co-curricular micro-credential.

Educational Content and Assessment of Student Learning

Expanding the work of the Development Committee, subject-matter workgroups were formed in three areas: (1) artificial intelligence, (2) data interpretation, and (3) emotional intelligence. Each workgroup included faculty subject-matter experts, an assessment advisor, and an instructional designer that developed the educational content and assessment of student learning outcomes required for its assigned micro-credential. Subject-matter experts refined student learning outcomes; used current, relevant literature to construct learning modules in the institution's learning management system; incorporated required readings and learning activities designed to facilitate learner attainment of knowledge, skills, abilities, and values; and developed formative and summative assessments to measure student competency in each micro-credential.

The subject-matter workgroups followed a backward-design instructional framework, which promotes curriculum development by setting goals (i.e., student learning outcomes) before choosing instructional methods and forms of assessment (Wiggins & McTighe, 2005). The backward-design strategy enhances learner achievement by focusing instruction on a global understanding of the educational content and incorporating assessment focused on desired learning outcomes. This approach establishes greater coherence among desired results, key performance indicators, and teaching and learning experiences, leading to better acquisition of knowledge and skills. Through backward-design processes, the subject-matter workgroups identified the desired student learning outcomes, determined acceptable levels of evidence demonstrating learner understanding, and designed learning experiences and instruction to ensure student achievement of desired learning results.

Student Learning Outcomes and Evidence of Attainment

The defined student learning outcomes for each micro-credential are presented in Table 1. Faculty or subject-matter experts gather evidence of learner understanding using direct and indirect measures and assess the attainment of desired student learning outcomes using formative and summative assessments. Direct measures of learner understanding include quizzes and assignments (e.g., video demonstrations, projects, presentations, and reflective writing). Indirect measures of learner understanding include a written summative reflection and final projects. Trained faculty or subject-matter experts use rubrics to facilitate consistent assessment of learner achievement.

Each module within the three micro-credentials includes formative quizzes comprising multiple-choice, fill-in-the-blank, or short-answer questions to assess learner understanding directly. Other assignments, such as video demonstrations, projects, and presentations, prompt learners to demonstrate their understanding and application of the competencies attained in specific modules. Rubrics for all open-ended assignments directly assess the learner's attainment of each student learning outcome related to the micro-credential.

Each micro-credential culminates with a summative written reflection assignment (of at least 600 words) in which each learner identifies his or her global understanding of the knowledge, skills, and abilities gained from completing the educational experience; the assignment allows learners to apply and examine the competencies they gained. To complete this reflection assignment, each learner self-evaluates his or her competency level; discusses the usefulness of the knowledge, skills, and abilities gained; identifies learning applications; and identifies how this learning may relate to a future career. The summative reflection rubric indirectly assesses the learner's understanding of, and appreciation for, the competencies attained in the micro-credential.

A score of 80 percent or higher on each assessment demonstrates the attainment of learner understanding. For each assignment, the learner has multiple attempts to achieve the minimum score. Learners who meet the criteria for success are awarded the micro-credential as a digital badge.

Pilot Study Results

FIU conducted a pilot study of the career readiness strategic initiative. The QEP micro-credentials were offered to select learners through synchronous curricular (i.e., embedded in a course) and/or asynchronous co-curricular (i.e., stand-alone, online modules) offerings. The purpose of the pilot study was fourfold: (1) to determine the appropriateness of the depth and breadth of the educational content delivered within the target timeframe of 16 to 20 hours, (2) to test assessment protocols that measure learner understanding, (3) to identify barriers to learner progression and completion, and (4) to understand learner perceptions of the micro-credential experience. Data and insight gleaned from the pilot study informed the university-wide implementation of the QEP.

Depth and Breadth of Educational Content

To gauge the appropriateness of the depth and breadth of educational content, the faculty members monitored learner progression through the instructional modules and timely completion within the target timeframe of 16 to 20 hours. Table 2 summarizes learner enrollment and micro-credential completion data.

A chi-square test of independence was performed to examine the relation between the mode of delivery and completion for each micro-credential (where data were available). For the Artificial Intelligence: How It Works and Its Impact micro-credential, there was no significant association between mode of delivery and completion [$\chi^2(1, N=35) = 1.94, p = 0.16$]. However, for the Understanding Emotional Intelligence micro-credential, the relationship between mode of delivery and completion was statistically significant [$\chi^2(1, N=49) = 7.51, p < 0.05$]. Specifically, students in the curricular mode of delivery were more likely to complete the micro-credential than students in the co-curricular delivery mode (85 percent versus 48 percent, respectively).

The faculty member who taught the Understanding Emotional Intelligence micro-credential, both the curricular and co-curricular modes of delivery, offered his insight:

From an instructor perspective, I found the integrated in-course version more manageable to teach and, based on the results, more effective in terms of student learning. As a faculty member who believes strongly in the value of micro-credentials for both student development and marketability, I found the in-course version provided more opportunities for working with students on how to tell the story of what they learned, and to this end, I even included a pitching exercise to challenge students to tell an employer in three minutes how some of what they learned made them good candidates for hiring. And because the course (Professional and Technical Writing) is focused on workplace preparedness, I was able to design the whole course around emotional intelligence, so students took a deep dive into the competency, including research. Additionally, I was able to demand more of the students in terms of writing, which in some cases resulted in better work on the final reflection. However, I was

Table 2. Pilot study learner enrollment and micro-credential completion

Micro-Credential	Curricular Mode of Delivery		Co-Curricular Mode of Delivery	
	Learners Enrolled (n)	Completion Rate (n, %)	Learners Enrolled (n)	Completion Rate (n, %)
Artificial Intelligence: How It Works and Its Impact	14	6 (43%)	21	14 (67%)
Thinking and Communicating with Data	–	–	24	15 (63%)
Understanding Emotional Intelligence	26	22 (85%)	23	11 (48%)

concerned about the balance between emotional intelligence content and the typical writing focus in the course. I felt I was doing less tech writing and more emotional intelligence in this course.

In contrast, the co-curricular version presented no integration challenges, but I found it harder to manage in terms of keeping students on track. As noted elsewhere, our well-intentioned pre-requisites broke down quickly when my ability to grade final reflections immediately impeded student progress. We removed the pre-requisites, but this required me to continuously review that students had earned the required score on the module reflections and, if they didn't, remind them that they needed to go back and revise in order to earn the badge. I like the idea of students earning the badge outside a class, but I think we need to develop different strategies for teaching the course, ensuring student motivation, and managing pre-requisites.

Assessment Protocols

To test assessment protocols that measure learner understanding, the faculty members administered assignments and graded them using developed rubrics. Based on learner feedback, some quiz questions in the Artificial Intelligence: How It Works and Its Impact micro-credential were revised to improve clarity. In the Understanding Emotional Intelligence micro-credential, the rubric for the final reflection was revised by splitting each sub-competency into three parts, which turned it into more of a checklist that better facilitated the grading process. In the co-curricular offering of this same micro-credential, the faculty member offered his review of an optional draft of the final reflection before submission. The learners responded positively to this option, which will be included in future deliveries of this micro-credential.

Barriers to Learner Progression and Completion

The faculty members initiated open communication pathways through Canvas announcements and e-mail to identify barriers to learner progression and completion. Through group-wide communication, faculty members encouraged learners to continue progressing through the educational content and offered support as needed. Through individual communications, faculty members were informed that some learners decided to unenroll due to other commitments and time constraints that prevented them from fulfilling the requirements of the micro-credential. In some cases, learner progression was hindered by the time required for faculty to grade assignments. Initially, learners had to complete a module and achieve a minimum score of 80 percent on the modular assessment to be granted access to the subsequent module. This barrier to progression was removed and will not be incorporated into future micro-credential offerings.

In the Thinking and Communicating with Data micro-credential, the presentation of group projects was replaced by having learners upload a short video to present their work. It was challenging to form groups and for groups to agree on a topic because learners had little contact with each other in the co-curricular, online mode of delivery. Strategies for promoting teamwork and collaborative learning will be needed for future co-curricular offerings of this micro-credential.

Within each mode of delivery (i.e., curricular and co-curricular), a chi-square test of independence was also conducted to assess the difference in completion rates between students in each micro-credential (where data were available). For the curricular mode of delivery, there was a significant difference between the Artificial Intelligence: How It Works and Its Impact and Understanding Emotional Intelligence micro-credential completion rates [$\chi2(1, N=40) = 7.56, p < 0.05$]. The Understanding Emotional Intelligence micro-credential had significantly higher completion rates than the Artificial Intelligence: How It Works and Its Impact micro-credential (43 percent vs. 85 percent, respectively). However, within the co-curricular mode of delivery, there were no significant differences in completion rates between the three micro-credentials [$\chi2(2, N=68) = 1.82, p = 0.40$].

Learner Perceptions

To understand learner perceptions of the micro-credential experience, FIU surveyed learners upon completing each micro-credential. Table 3 summarizes learner responses to questions about perceived learning and growth experienced by completing the micro-credential.

Other survey questions related to student satisfaction with the micro-credential experience included: How much did you transform/grow from the experience of earning the badge? (4-point scale anchors: More than I expected; None at all); How satisfied are you with this badging experience? (7-point scale anchors: Very satisfied; Strongly dissatisfied); Would you consider participating in an additional badge experience? (7-point scale anchors: Very likely; Very unlikely); and Would you recommend this badge to a classmate/colleague? (4-point scale anchors: Highly recommend; Not recommend). Aggregated data collected from these survey items are presented in Figure 1.

DISCUSSION

Research suggests that faculty members are more likely to participate in strategic planning if the process is well-structured and purposeful, the university leadership is involved, accountability metrics are developed for defined deliverables, and the implementation process is well-defined (Thompson, 2017). The FIU strategic plan, and resultant QEP, were intentionally faculty-driven, supported by the institution leadership with a commitment to human and financial resources. The institution allocated

Table 3. Pilot survey responses

Instructions: Please rate your agreement on the following statements:	Micro-credential	Strongly agree	Agree	Somewhat agree	Neither	Somewhat disagree	Disagree	Strongly disagree
1. After going through the process of completing the badge content, I am better prepared to talk about my strengths and weaknesses.	AI	43%	43%	14%	0%	0%	0%	0%
	Data	0%	17%	83%	0%	0%	0%	0%
	EI	64%	18%	18%	0%	0%	0%	0%
2. After going through the process of completing the badge content, I believe I have increased my ability to work independently.	AI	43%	57%	0%	0%	0%	0%	0%
	Data	17%	33%	17%	33%	0%	0%	0%
	EI	64%	9%	18%	9%	0%	0%	0%
3. After going through the process of completing the badge content, I am more comfortable receiving critical feedback.	AI	57%	14%	14%	14%	0%	0%	0%
	Data	0%	33%	33%	33%	0%	0%	0%
	EI	55%	36%	0%	9%	0%	0%	0%
4. The learning experiences I had completing the badge content were more engaging than a typical class/continuing education experience.	AI	43%	29%	14%	14%	0%	0%	0%
	Data	0%	17%	17%	17%	0%	17%	33%
	EI	55%	0%	36%	0%	0%	9%	0%
5. After completing the badge content, I believe I am more employable.	AI	43%	29%	14%	14%	0%	0%	0%
	Data	33%	33%	17%	17%	0%	0%	0%
	EI	46%	9%	27%	18%	0%	0%	0%
6. If earned, I will include this experience during the hiring process.	AI	57%	29%	0%	0%	14%	0%	0%
	Data	33%	50%	17%	0%	0%	0%	0%
	EI	73%	9%	9%	9%	0%	0%	0%
7. Earning the badge gives me the confidence I can activate the skill in the workplace.	AI	43%	29%	29%	0%	0%	0%	0%
	Data	17%	50%	17%	17%	0%	0%	0%
	EI	64%	18%	9%	9%	0%	0%	0%

Note: AI=Artificial Intelligence: How It Works and Its Impact (N=7), Data=Thinking and Communicating with Data (N=6), EI=Understanding Emotional Intelligence (N=11).

Figure 1. Aggregated data on student satisfaction with the micro-credential experience

Note: AI=Artificial Intelligence: How It Works and Its Impact (N=7), Data=Thinking and Communicating with Data (N=6), EI=Understanding Emotional Intelligence (N=11).
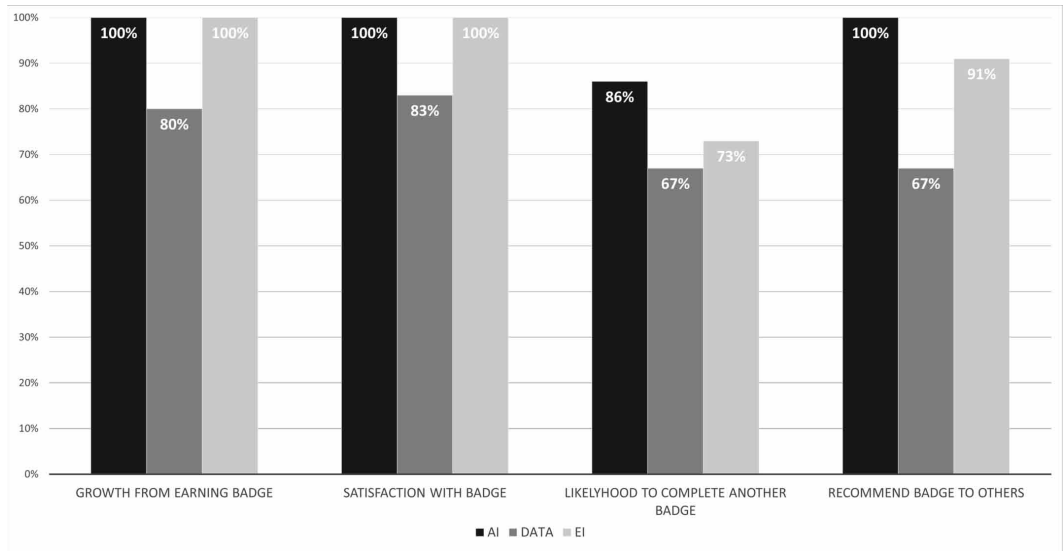
a QEP budget to cover the costs of personnel and expenses spanning five years. Specifically, a QEP organizational structure was developed with a Faculty QEP Director to provide broad oversight of plan implementation, three Faculty QEP Co-Chairs to facilitate the delivery of the three micro-credentials, a QEP Manager to support the administration of the plan, a Steering Committee of faculty members and subject-matter experts to provide ongoing guidance for continuous improvement, a QEP Advisory Board of industry partners to ensure alignment of the micro-credentials with workforce needs, and a cadre of trained Micro-Credential Faculty to deliver the micro-credentials and assess student learning and competency attainment.

FIU developed a comprehensive assessment plan, comprising quantitative and qualitative data collected through direct and indirect measures, to assess the achievement of the QEP goals. Beginning with the pilot study, a detailed data collection timeline to assess achievement of performance measures (e.g., faculty engagement) and student learning outcomes will inform ongoing data-driven improvement strategies such as those gleaned from the pilot study, including but limited to revisions to quiz items and strategies to motivate learners through completion. The results of the pilot study are limited in that three faculty members (one per QEP micro-credential) delivered the content to select students; therefore, learner outcomes and perceptions are based on a small sample of students. Regardless of sample size, pilot study data helped improve assessment protocols (e.g., quiz items revised for better clarity) before university-wide implementation.

The ongoing comprehensive assessment plan of the QEP provides a framework for conducting future research on closing the gap between students' career readiness and employers' expectations. With the university-wide implementation of the QEP over five years, evaluating student learning outcomes and competency attainment across the three micro-credentials will be possible among a much larger student sample. As students complete these micro-credentials, graduate, and enter the workforce, a longitudinal study on employment rate and starting salary 1-year post graduation for micro-credential completers versus non-completers is warranted to determine the impact on student success post-graduation. Future research should explore employers' perceptions of these micro-credentials in satisfying their expectations of the knowledge, skills, abilities, and values required to be

successful in the 21st-century workforce. Additionally, the QEP micro-credentials could be offered to alums and community members to support upskilling and/or reskilling of the current workforce; this would provide an opportunity to study the impact of these micro-credentials on another population.

CONCLUSION

The purpose of this case study was to highlight how strategic planning grounded by a research-based evaluation processes with broad-based support from university stakeholders resulted in an innovative and agile quality enhancement plan that certifies learner competencies in critical skills deemed necessary for success in the 21st-century workforce. Using a faculty-driven approach, FIU successfully leveraged a required institutional effectiveness accreditation process to develop and implement a university-wide strategic initiative focusing on student learning outcomes and success.

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