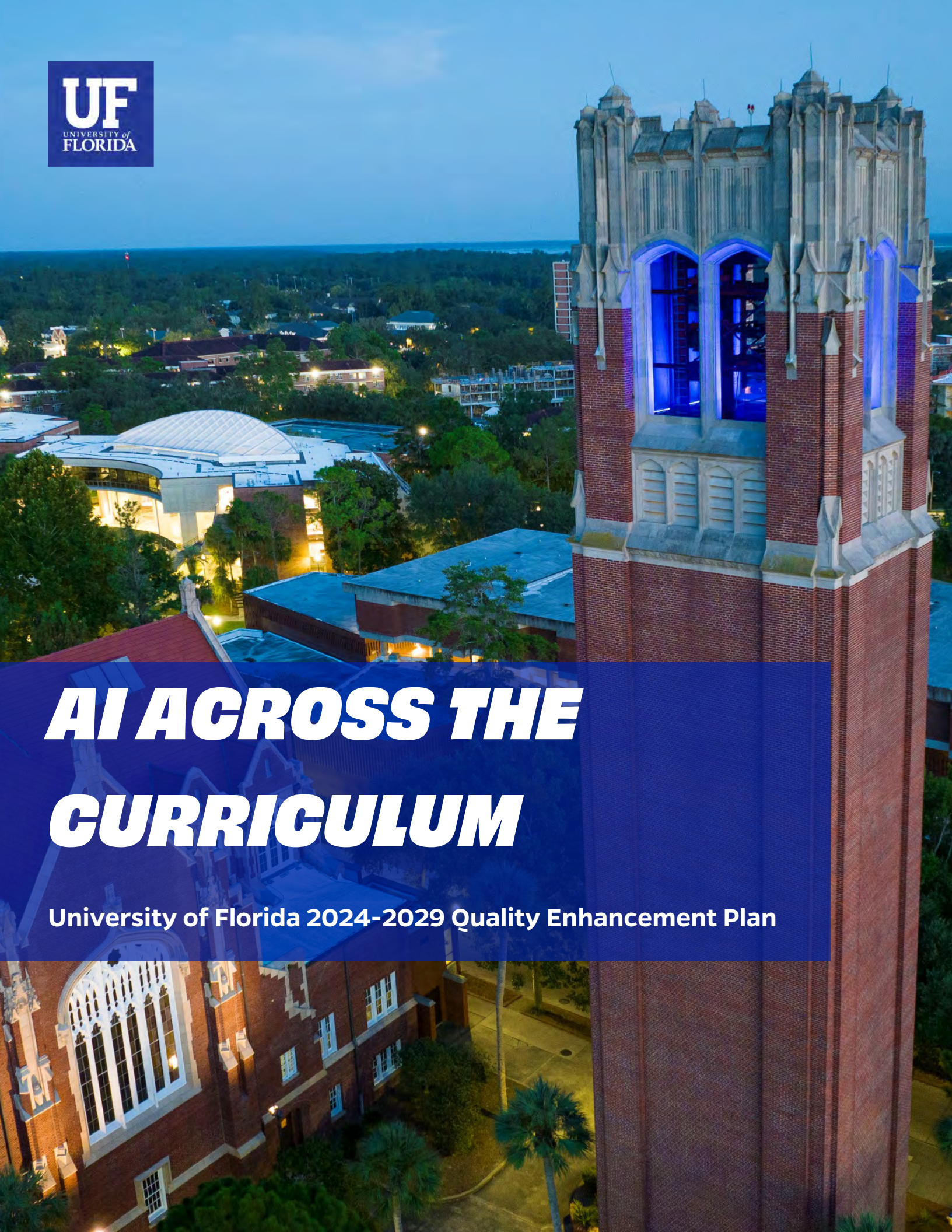

AI ACROSS THE CURRICULUM

University of Florida 2024-2029 Quality Enhancement Plan

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AI ACROSS THE CURRICULUM

University of Florida 2024-2029 Quality Enhancement Plan

JANUARY 2024

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EXECUTIVE SUMMARY

The expansion of Artificial Intelligence (AI) - broadly understood as computational systems and toolsets that think and act rationally or in some cases like humans (Russell & Norvig, 1995) - has led to unprecedented changes in our personal and professional lives in the 21st century. One of the most urgent needs for the workforce are individuals who are AI-literate, and institutions of higher education are in a unique position to develop students' AI literacy (Kandlhofer et al., 2016; Luckin et al., 2022; Ng et al., 2021). To meet the university's mission to enable our students to lead and influence the next generation and address the need for an AI-literate workforce, we envision a campus where all students can develop their AI literacy flexibly in ways appropriate to their interests, personal, and professional goals through rigorous, well-designed academic courses and experiences. To advance this vision and our institutional mission we developed *AI Across the Curriculum* as a five-year Quality Enhancement Plan (QEP). *AI Across the Curriculum* is designed to provide students with the resources and skills to become successful digital citizens and global collaborators (Zimmerman, 2018), acquire basic awareness and general knowledge of AI, have the opportunity to apply and use AI in relevant, discipline-specific ways, and develop foundational expertise in AI.

We selected our topic through the strategic, integrated efforts of the faculty, staff, students, and administrators to maximize the institution-wide impact of significant recent donor support and NVIDIA's gift of higher education's eighth most powerful supercomputer and the 22nd most powerful system in the world, called *HiPerGator*. These gifts completely transformed UF's computational abilities and AI opportunities campus wide (Southworth et al., 2023). Our QEP, led by faculty with significant administrative support through UF's new Artificial Intelligence Academic Initiatives (AI^2) Center, operationalizes this unique resource for the academic benefit of our undergraduate students.

We developed our topic through a thoughtful, inclusive, campus-wide process initiated by the provost. Two faculty members were assigned as QEP co-chairs, and an institutionally representative Task Force of faculty, staff, students, and administrators was convened in September 2021 and charged to develop a five-year plan (2024-2029) that would provide all undergraduate students at UF the opportunity to acquire knowledge, skills, and applications in AI. To meet this charge, the Task Force met for 18 months to develop and refine the initiatives that would operationalize the project across the institution. QEP leadership engaged the Task Force members as a distributed network that empowered each Task Force member to present the developing initiatives to their respective constituencies and bring their suggestions for modification and improvement to the Task Force meetings for consideration. This process led to an institutional consensus on four campus-wide QEP initiatives: curriculum development (which includes five types of course categorization by the University Curriculum Committee based on AI content), academic programs, AI Scholars and Medallion programs, and AI Professional Pathways and Career Readiness.

Following UF's established guidelines, the Task Force developed six student learning outcomes (SLOs) that are grounded in the four artificial intelligence literacies defined by Ng et al. (2021) and three goals and their concomitant measurable objectives as indicators of institutional progress toward the success of our plan. The assessment of these outcomes and goals intentionally integrates into UF's existing annual assessment and institutional effectiveness system for reporting, evaluation, and use of results for improvement as we advance our vision of UF as a campus where all students have the opportunity to become AI-literate through coursework and experiences embedded in their academic programs.

CHAPTER 1

PROCESS USED TO IDENTIFY

CHAPTER 1:
PROCESS USED TO IDENTIFY AND DEVELOP THE TOPIC

As a large, comprehensive, decentralized AAU research institution, the identification and development of a topic for institution-wide projects and programs at the University of Florida requires representative, broad-based participation from an array of institutional constituencies. We achieved this through a thoughtful, university-wide effort initiated by the provost.

Two faculty members who were integrated in department, college, and university AI efforts were nominated and consequently selected as co-chairs to develop a QEP that provides students with the opportunity to acquire knowledge, skills, and applications in AI. The five-year plan (2024-2029) coincides with UF's existing long-term initiative Your Pathway to AI, which places AI at the center of a major effort that combines world-class research infrastructure and cutting-edge research with a transformative curriculum (University of Florida, 2021b).

The Task Force included representatives from across the university and is identified at the beginning of this report. Task Force membership remained dynamic and responsive to developing ideas, so members were added as new expertise or perspectives were identified. The co-chairs and Task Force began their work in September 2021. In this chapter, we review our processes for topic identification, refinement, and development.

| TOPIC IDENTIFICATION

As one of its strategic initiatives, UF has been building a comprehensive, inclusive model as the nation's first AI university. UF's model consists of four primary components: AI Research, Workforce Development and Career Readiness, Educational Partnerships, and AI Across the Curriculum. Our QEP topic is the operationalization of the AI Across the Curriculum element of the model for undergraduate students.

THE ARTIFICIAL INTELLIGENCE INITIATIVE AT THE UNIVERSITY OF FLORIDA

The University of Florida (UF) has launched an Artificial Intelligence (AI) initiative. This new initiative is described as:

> *The University of Florida is making artificial intelligence the centerpiece of a major, long-term initiative that is combining world-class research infrastructure, cutting-edge research, and a transformational approach to curriculum. Its depth is making the university a leader in AI research and development; its breadth will make sure every UF student develops a basic competency in AI regardless of their field of study.*
>
> *From the development and training of an AI-enabled workforce to the application of AI against a wide array of pressing challenges, UF will serve a critical role in advancing and protecting the state we call home. Supporting UF's AI initiative is to support a catalyst for Florida's future prosperity and growth. Extracted from [ai.ufl.edu - AI - University of Florida]*
>
> *UF further identified AI in their 2020 and 2021 Accountability Plans (extracted from [https://www.flbog.edu/board/accountability-plans/])*

The 2020 UF Accountability Plan identified the following AI-based strategies:

> *The third strategy is to implement a pan-university initiative in artificial intelligence (and associated areas like data science and the internet of things). AI is rapidly becoming a key pillar of the 21st century American economy that will revolutionize science, medicine, business, and a host of other fields. In partnership with a major American technology company, UF is ratcheting up its research enterprise in AI and is developing a new model for AI workforce development that many in national circles believe is sorely needed. In order to do this, UF is adopting a philosophy of "AI across the curriculum" to ensure that any student who wishes*

to graduate with the tools of AI is able to do so.

UF also has a remarkable opportunity with a major technology company to take a bold new step into artificial intelligence. Through state-of-the-art supercomputing technology, strong AI research programs, and an innovative approach to AI workforce development by adopting an "AI across the curriculum" philosophy, UF aims to become a national leader and national asset in this area in relatively short order.

The 2020 plan also identified a key investment related to AI:

UF is launching a new university-wide initiative in artificial intelligence. AI is predicted to be an increasingly important component of the 21st century economy. Our nation must focus on educating an AI-enabled workforce if our economy is to continue to lead the world. In partnership with a major U.S. AI technology company, we will perfuse the university research, education, and outreach programs with the latest AI technology. By January 2021, we expect to have up and running the latest technology to enable research and training in AI across the curriculum. We, and others, believe that our plan can serve as a national template for AI workforce education and research.

The 2021 UF Accountability Plan provided additional development of AI at UF and modified the AI strategy.

The second strategy is to build and exploit UF's opportunities in Artificial Intelligence and Data Science to strengthen UF, the SUS, and the State economy. UF has installed higher education's most powerful AI supercomputer for training and research purposes and has offered its use to the SUS. UF is the first university to adopt an "AI Across the Curriculum" approach to providing every student in every major the opportunity to acquire competence and expertise in AI and Data Science. The university is positioning itself as a leader in the urgent national conversation about developing a 21st century AI-enabled workforce. As part of this initiative, UF is hiring 100 additional faculty members in AI and applications to further strengthen its research initiatives, outreach to industry, and curricular developments.

Because of UF's achievements, NVIDIA's co-founder and the NVIDIA Corp. partnered to gift UF higher education's most powerful Artificial Intelligence supercomputer, HiPerGator AI. It provides the platform for UF's AI and Data Science initiative that is rapidly transforming the university's curriculum, research, and outreach. It came just as the federal government focused attention and resources on AI as perilous national security and economic competitiveness issues. UF is leveraging this opportunity by offering a replicable model to help the state and nation develop an AI-enabled workforce.

The 2021 Plan also identified key investments:

The AI and Data Science initiative is a transformative opportunity for UF. Every college is participating. With a philosophy of "AI Across the Curriculum", every department is rethinking how these tools will transform the future of their disciplines and allied educational and research programs. Research faculty are beginning to leverage HiPerGator AI to tackle real-world problems previously unattainable. UF is participating in a national conversation to train a 21st century skilled AI workforce at scale, with huge implications for the Florida economy.

UF is focused on the design and construction of two large projects. The first is the construction and programming of the Data Science and Information Technology building that will bring together researchers from across the campus. The second is the design of an Honors Residence Hall that will help UF recruit high achieving students into its Honors program and provide them with appropriate programming opportunities. UF is working with multiple partners to help attract new industry to the State.

In summary, $70 million has been invested in AI including $25 million from UF alumnus Chris Malachowsky, $25 million from NVIDIA, and $20 million from UF towards 100 new faculty hires and HiPerGator enhancements.

MISSION ALIGNMENT

The University of Florida (UF) is ranked nationally the #1 and #6 public university by the Wall Street Journal and the U.S. News & World Report respectively and is a comprehensive learning institution with a land-grant mission and a dedication to excellence.

> *The University of Florida in 2015 adopted "The Decade Ahead" strategic plan comprising seven university wide goals and objectives and one overarching aspiration: "That the University of Florida will be a premier university that the state, nation and world will look to for leadership."*

Two of these goals and core values were (1) **excellence** and (2) **discovery and innovation**.

> ***Excellence**. Strive for greatness as an institution that brings out the best in each individual. Our standard is to be the best by doing our best. We strive to lead with integrity and distinction in all our endeavors. Excellence requires continuous improvement, accountability, and the courage to recognize that there is always more we can do to deliver the highest quality performance.*
>
> ***Discovery and Innovation**. Collaborate on the uncharted frontiers of knowledge to seek truth and make the world a better place. Discovery is at our core. We are driven to bring fresh perspectives that create new knowledge and understanding in the classroom and beyond. It is our creative risk-taking that creates transformative change. We are constantly looking for ways to drive scholarship and service that push our campus, community and the world forward. We should never be satisfied with the status quo, but always look for inspiration and new ways of doing things. (Extracted from 2022 UF Strategic Plan).*

The UF QEP also aligns with all six **UF Core Values**, which include (1) excellence, (2) discovery & innovation, (3) inclusion, (4) freedom & civility, (5) community, and (6) stewardship.

AI has become a ubiquitous part of life. Recent advances in computational abilities and greater affordability of technology have contributed to the integration of AI across all sectors. The need for AI education supporting ***excellence*** and ***discovery and innovation*** is evident and recognized by UF leadership and UF visionary partners. The financial investment in AI at UF has been made, resulting in faculty hires, buildings, and a new supercomputer. This investment has created a solid foundation to further grow an AI initiative focused on education and learning.

UF INVESTMENT IN AI

The University of Florida with support from NVIDIA recently launched higher education's eighth most powerful supercomputer and the 22nd most powerful system in the world, which represents a complete transformation for computational abilities and opportunities campus wide (Southworth et al, 2023). The supercomputer, called *HiPerGator*, is a room-sized supercomputer that draws 1.1 MW at full capacity. *HiPerGator* is built with 291,024 cores using 148 NVIDIA DGX systems and 1120 NVIDIA A100 processors which are optimized for AI operations. When processing, *HiPerGator* chews through calculations peaking at 21,314.7 teraflops/second. It is this investment that helped spur the initiative to develop *AI Across the Curriculum* at UF, and while researchers must pay for its use on funded projects, the resource is freely available for instructional and pedagogical purposes.

NVIDIA's Director of Higher Education Research, Cheryl Martin, sees a future where AI-ready employees will be crucial to the workforce; and thus, NVIDIA contributed UF's supercomputer to support this outcome. She also recognizes opportunities for rethinking jobs through technological change—creating new tools or training people in skills needed by 21st-century industries, but which currently have not been integrated into campus-wide curricula. With the help of NVIDIA, students and faculty at UF can access a supercomputer for research or teaching. This is an exciting development in education because it not only provides access to powerful computer hardware but also creates a skilled workforce trained in how to best use such technology.

UF is unique given the breadth of disciplines and expertise available at the state's premier land-grant institution, with hundreds of faculty members already using AI in their research and teaching programs. UF's faculty was recently expanded with the addition of over 100 newly hired, AI-focused faculty to increase the

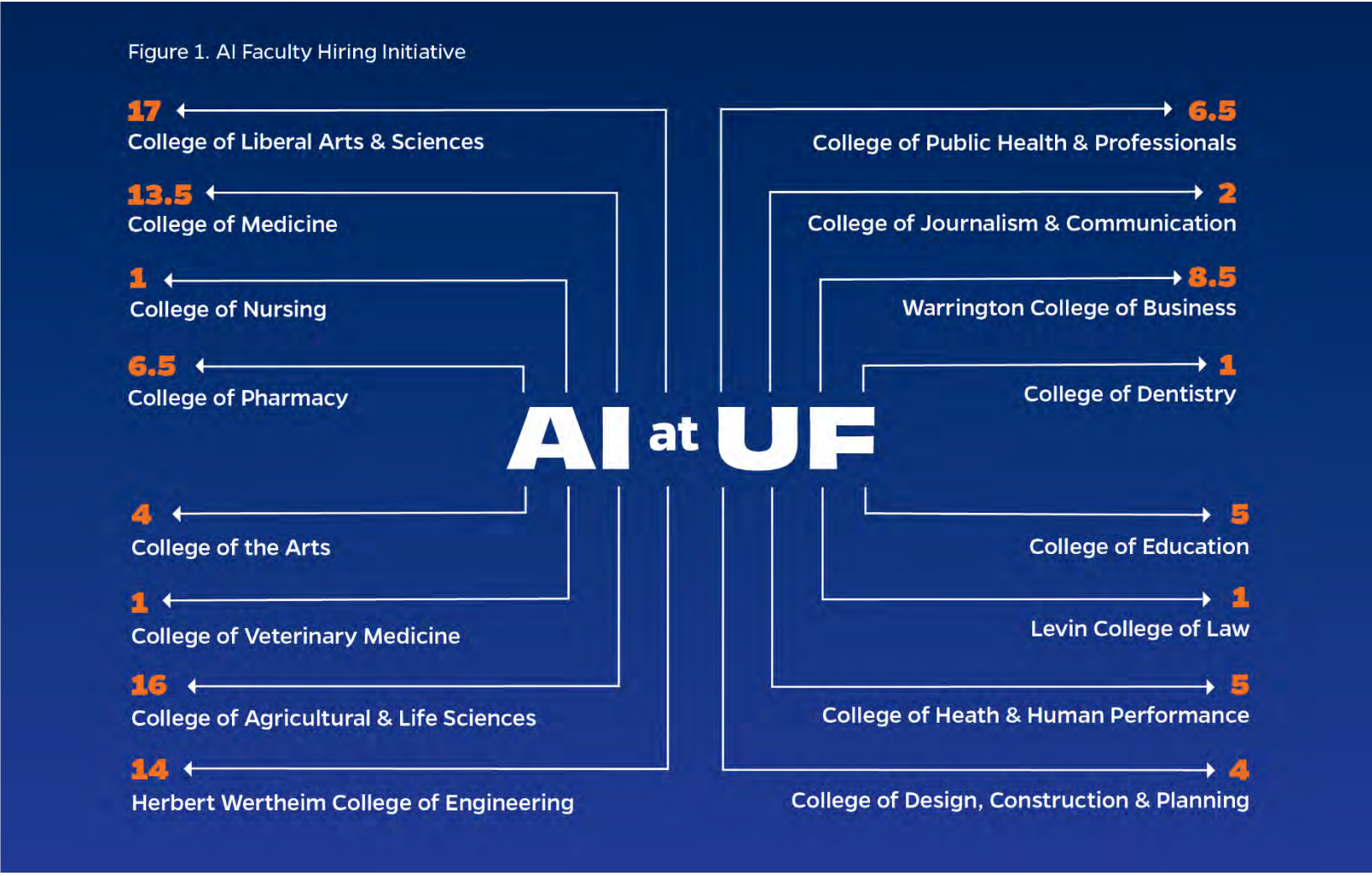
university's AI teaching and research capacity and to prepare thousands of students annually to enter society equipped for success.

The former university Provost, Dr. Joseph Glover (2022), believes this to be a transformational initiative given the resource investment and the many opportunities available through these technologies. Based on these investments in AI, the greater goal then becomes how to bring *AI Across the Curriculum* to fruition in terms of pedagogy, curricular design, and program development, so that all interested UF students can engage in AI to revolutionize our institution and our future. The development of this QEP is how UF plans to integrate AI across the curriculum and presents it as a model for other universities.

This obvious need for a shift in our programs to integrate cross-cutting pedagogy focused on AI was noted by UF leadership in the UF 2020 and 2021 Accountability Plans (University of Florida, 2020; University of Florida, 2021a). The plans outline the need for a focus on AI to provide a growing future economy for Florida, to allow the university to become a national leader in AI, and to provide increased opportunities for our students. UF made AI the centerpiece of a major, long-term initiative that combines world-class research infrastructure, cutting-edge research, and a transformational approach to curriculum. The University's AI efforts were further supported by investment from private and corporate philanthropy, the launch of a new supercomputer (previously described), and over 100 new faculty hires across all 16 colleges (Figure 1) with more hiring still underway. The UF Provost also recognized the need for centralized leadership of such a bold academic effort and established the Artificial Intelligence Academic Initiative (AI^2) Center in 2022. This AI^2 Center provides leadership and organization for the UF AI curriculum and other AI-related academic activities across campus, and will manage programs and reporting, as required, as part of the QEP.

HiperGator
Super computer at the University of Florida

Figure 1. AI Faculty Hiring Initiative



The college locations of the 106-faculty hired as part of the AI faculty initiative 2020–22, an ongoing process, with another two faculty in the Libraries and Florida Museum, and more hires currently underway. Note 0.5 faculty indicates faculty in joint appointments across different colleges.

TOPIC DEVELOPMENT: BUILDING CONSENSUS

Once the co-chairs and the Task Force members were given the QEP charge, they organized regular meetings to share information and explore ideas. During initial meetings, a survey of UF Deans (representing UF colleges) was proposed and conducted. The survey content and results are provided in Appendix A. UF faculty, staff and students were also surveyed for further refinement (see Appendix B for survey questions and results).

Given the AI-based activities already ongoing at UF, the co-chairs began the QEP Task Force effort with brainstorming sessions. This was followed by idea refinement and continued meetings of initiative subgroups. The co-chairs met weekly to assimilate subgroup output and provide adaptive direction for continued progress.

The first QEP Task Force meeting was on November 8, 2021. This meeting included the charge by Dr. Tim Brophy, former Director of Institutional Assessment, to "develop a five-year plan (2024-2029) that will provide all students at the University of Florida the opportunity to acquire knowledge, skills, and applications in artificial intelligence."

The first Task Force meeting provided space for unrestricted brainstorming on ideas for the QEP and mingling amongst the Task Force members. Questions were provided to prompt Task Force members to think about directions and needs for the QEP focused on AI as a topic. Example questions included:

1. What types/levels of structure are needed for consistency/communication/reduced redundancy in AI efforts related AI across the curriculum/teaching/learning?
2. What initiatives would promote undergraduate student engagement/learning with AI?
3. What initiatives would promote workforce/professional engagement/learning with AI?
4. How can we encourage engagement in AI activities?

At the end of the brainstorming session, attendees were asked to vote for their top 10 'idea' choices to consider in developing the QEP. The exercise included 14 questions and answers and all results were documented.

The second QEP Task Force meeting was held on December 3, 2021. The co-chairs reviewed and organized the information from the brainstorming session and created six draft themes or initiatives considering the strongest ideas as proposed (voted) by the Task Force members. The six emerging themes were:

1. AI campus-wide coordination,
2. AI learning outside traditional classroom,
3. Incentives for AI participation,
4. All scholars for AI,
5. Course development and credential tracking, and
6. AI internships and careers.

Each theme or initiative was assigned to a breakout group of Task Force members. The co-chairs provided a printout of all the ideas from the previous brainstorming meeting and asked each breakout group to select activities they thought should be included under a particular theme. A 'wildcard' table/theme was also provided for ideas that might not be captured by the other themes. Output from this exercise was a list of activities/programs associated with each theme or initiative as selected by Task Force members.

The third QEP Task Force meeting was held on December 14, 2021, to consolidate ideas and to derive the main initiatives of the QEP. Task Force members were once again divided into breakout groups, each having a theme/initiative that evolved from the first two meetings. Each group was asked to complete a template for their initiative that included a detailed description, the audience, assessment methods, and resources needed.

Following this activity, the Task Force members were asked to complete a survey form on their expertise and interest so that they could be assigned to groups for the next phase of the QEP. Refinement activities focused the QEP initiatives to five. Five respective initiative groups were formed: 1) Creation of an AI Academic Initiative Center; 2) Curriculum Development; 3) Certificate Programs; 4) AI Scholars Program; and 5) Career Center and Workforce Development. During the spring semester the initiative groups met (with each group leading one initiative) between Task Force meetings with assignments as follows:

DATES	TASK FORCE ASSIGNMENTS
February 2022	Identify programs at UF (university wide, in colleges, or in departments/units) that already exist, could be expanded, or provide foundational structure for your group's initiative (could be a different application such as in international programs but the structure would be transferrable to an AI initiative).
March 2022	Identify what new or expanded programs, processes, and mechanisms are needed for your initiative to be successful at UF. This would provide a 'map' to show how the initiative would exist at UF, consider what might be needed from a faculty perspective, student perspective, and administrative perspective.
April 2022	Review the student success measurement/assessment ideas generated from the exercise at the March 22 Task Force meeting. Select the top 3 your group believes provides a good indication of success for your initiative and that the data could be collected.
May 2022	Develop a goal(s) for your initiative.

Task Force members were assigned to each group but had the opportunity to switch groups or participate in multiple groups as aligned with their interests. A QEP Task Force website was created and maintained by UF administration. Regular meetings between UF leadership and the QEP leaders occurred to ensure vision alignment and to incorporate developing ideas across campus on AI and data science. Specifically, meetings were held with the provost, associate provost for strategic initiatives, associate provost for undergraduate affairs, advancement, and institutional assessment leaders.

Former Provost Glover committed resources to initiate the new AI^2 Center and appointed Associate Provost David Reed as its director on March 14, 2022. This fulfilled an essential initiative proposed by the Task Force and provided organizational structure for the remaining initiatives, and all further QEP Task Force efforts were conducted in coordination with the AI^2 Center. The AI^2 Center will oversee the implementation of the QEP and other programs across UF related to AI – including programs for faculty development, graduate students, and others. Once established, the AI^2 Center was no longer a QEP initiative but an organizational entity overseeing its implementation and assessment.

The QEP Assessment Subcommittee was appointed March 31, 2022, by Dr. Tim Brophy to work specifically on SLOs, goal refinement, and student success metrics. This group met every two weeks, approximately from May 2022 to March 2023. The group was composed of UF experts in assessment and QEP development. The subcommittee provided a final report with SLOs, rubrics, and goals in March of 2023.

The QEP Task Force Co-chairs presented the QEP theme to the Faculty Senate Steering Committee on April 7, 2022, and the Faculty Senate on April 14, 2022, to ensure full faculty support for the program.

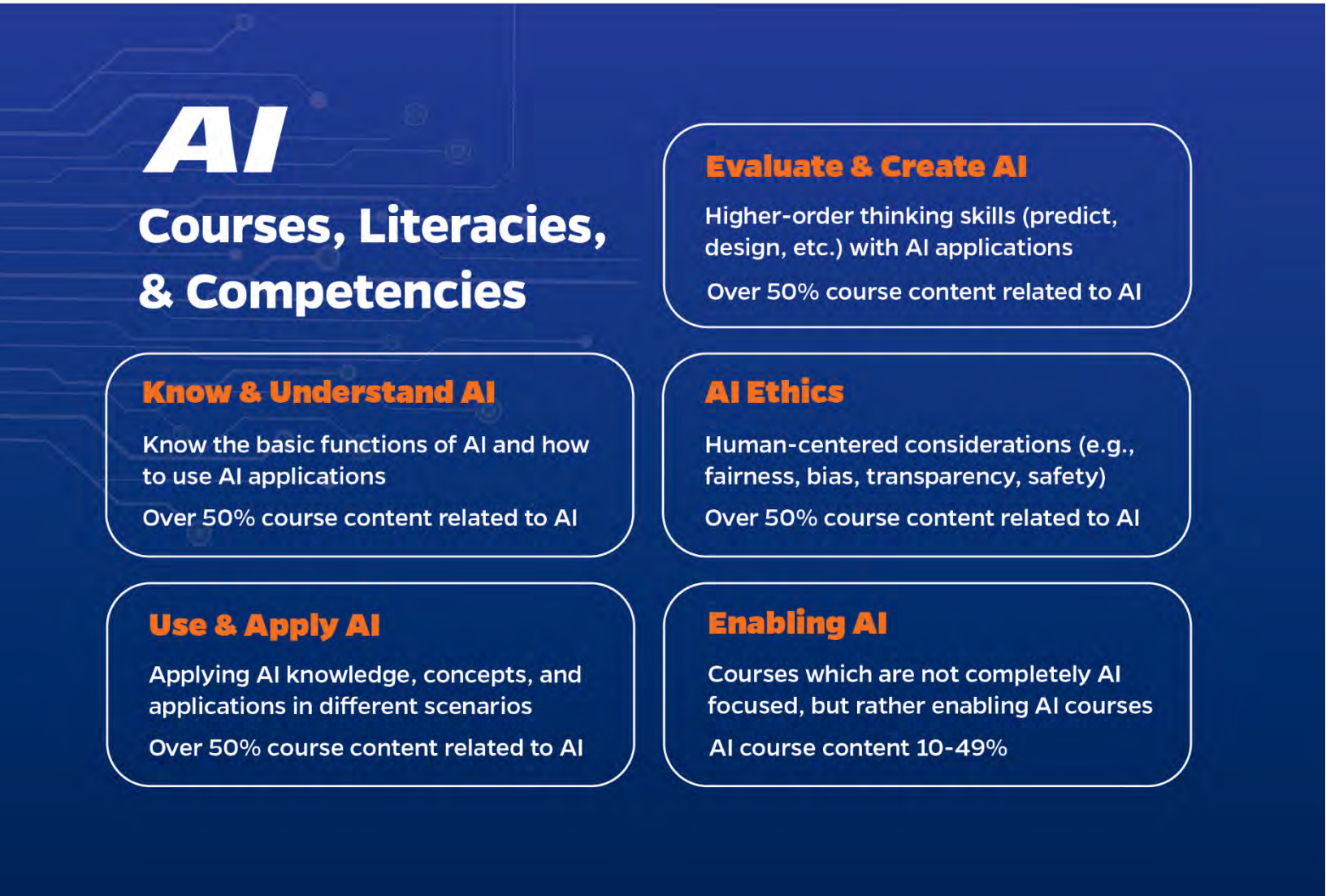
The AI^2 Center and the QEP Task Force co-hosted a workshop on May 9, 2022, to consider the process of linking existing and future AI courses to the following AI literacy topics, as outlined by Ng et al. (2021):

1. Know & Understand AI
2. Use & Apply AI
3. Evaluate & Create AI
4. AI Ethics

The four core AI literacy topics (explained in detail in Chapter 2) are used to categorize the type of knowledge and skills students are gaining through learning experiences. A fifth category, "AI Enabled", was also identified to capture academic courses that support AI through related knowledge and skill development and/or contain a lower total AI content of one of the four core AI literacy topics.

This workshop integrated members of the QEP Task Force, QEP subcommittee on assessment, and the UF AI Curriculum Working Group. Output from this event was used by the QEP Assessment Subcommittee to draft an AI Literacy Topic framework for reviewing and identifying AI courses, and to develop SLOs (Figure 2). This process is explained in detail in Chapter 4.

Figure 2. AI Literacy Topic Framework for developing student learning outcomes and reviewing and identifying AI courses (Developed based on Ng et al., 2021).



Starting on September 8, 2022, the AI^2 Center began a new AI Curriculum Workgroup comprised of UF faculty representatives from all colleges and led by Dr. David Reed. This group was charged by Dr. Reed to become the initial committee of the University Curriculum Committee (UCC) to review courses for AI identification by literacy topic. This workgroup began monthly meetings to create a course designation approval process and will start reviewing identified UF AI courses in the fall of 2023 (approval process is described in detail in chapter 4). A new AI^2 Center Project Manager joined the team to provide support for this process. A workshop was held on November 10, 2022, focused on the AI curriculum portion.

The QEP Task Force resumed fall meetings on September 28, 2022. The first meeting reviewed progress made by the assessment subcommittee on SLOs and goals for the QEP. This meeting was moved to email correspondence due to Hurricane Ian. On November 2, 2022, a QEP Task Force meeting was held to review assessment team progress, review with the task force updates from the summer assessment meetings, review initiative text in the QEP document, and discuss the path forward.

The AI^2 Center facilitated an AI Curriculum Workgroup workshop on November 28, 2022, focused on the submittal process for AI course designation. In preparation for the workshop, the co-chairs of the QEP Task Force, along with the AI^2 Center Project Manager, crafted a preliminary online form for AI course designations (refer to Appendix C). This form will be integrated into the UF course approval process and is required when proposing a course for consideration within any of the five AI course categories: Know-AI, Use-AI, Build-AI, Ethical-AI, and Enable-AI. The workshop attendees, members of the AI Curriculum Workgroup, provided and integrated input into the form.

We anticipate that members of the AI Curriculum Workgroup will form the inaugural AI Curriculum Committee (AICC), to be established in the Fall of 2023. The form and associated documents (e.g., syllabi) will be uploaded for review by the AI Curriculum Committee (AICC). Meetings continued through 2023 to refine the process for AI designation curriculum review.

The co-chairs presented the QEP initiatives and AI literacies to the UF Board of Trustees on December 8, 2022. On January 20, 2023, the AI^2 Center Director met with the Associate Provost for Undergraduate Affairs to integrate the AI course designation approval process with the established UF course approval process (see Approval Flow Process for AI-Designated Courses in Chapter 4). Throughout Spring 2023, the Assessment subcommittee, led by Dr. David Miller, continued to meet and develop the assessment tools for the QEP (see Chapter 5 for description).

BROAD-BASED INVOLVEMENT

Additional review and feedback of the Task Force initiatives were collected by targeting UF employee and student audiences and others engaged in the UF AI effort. A QEP Task Force presentation template was created and shared with all Task Force members. In addition, the co-chairs recorded a presentation that was distributed widely via a media site link. Task Force members presented a PowerPoint presentation or used the pre-recorded content to share information about the QEP and the proposed initiatives for AI Across the Curriculum. A Qualtrics survey was created to collect feedback from students, faculty, staff, and others for further refinement of the initiatives after receiving the presentation content (see Appendix B for survey questions and data). The presentation was delivered to at least 16 groups between May 20, 2022, and February 9, 2023.

Very few students completed the survey, only 22. The students were from the College of Agricultural and Life Sciences, College of Liberal Arts and Sciences, College of Medicine, College of Public Health and Health Professionals, and College of the Arts. The majority indicated that being more knowledgeable about AI would benefit them as a graduate of UF. Students indicated that curriculum development and certificate programs would benefit them most in terms of AI initiatives. One suggestion for additional AI focus from students was to include 'unintended consequences of AI'. For advertising the QEP initiatives to students, the top method selected was email, closely followed by social media (See Appendix B.1.b for survey results).

The faculty and staff survey was completed by 50 individuals. The majority of people who completed the survey did not teach or conduct research related to AI. However, of those that did describe AI as part of the program, the majority reported to alignment with the use and application of AI. The faculty and staff were most interested in the certificate programs and curriculum development related to AI. They were also interested in the AI^2 Center and its role. Faculty and staff indicated the certificate programs, Career Connections Center (C3)

workforce development, and AI Scholars would most benefit students. They acknowledged that additional training, collaboration events, and communication about AI programs would help support the success of QEP initiatives. Those surveyed also felt that social media was the best way to advertise these opportunities to students, followed by email. They also recommended educating academic advisors about the AI initiative and related AI opportunities for students (See Appendix B.2.b for survey results).

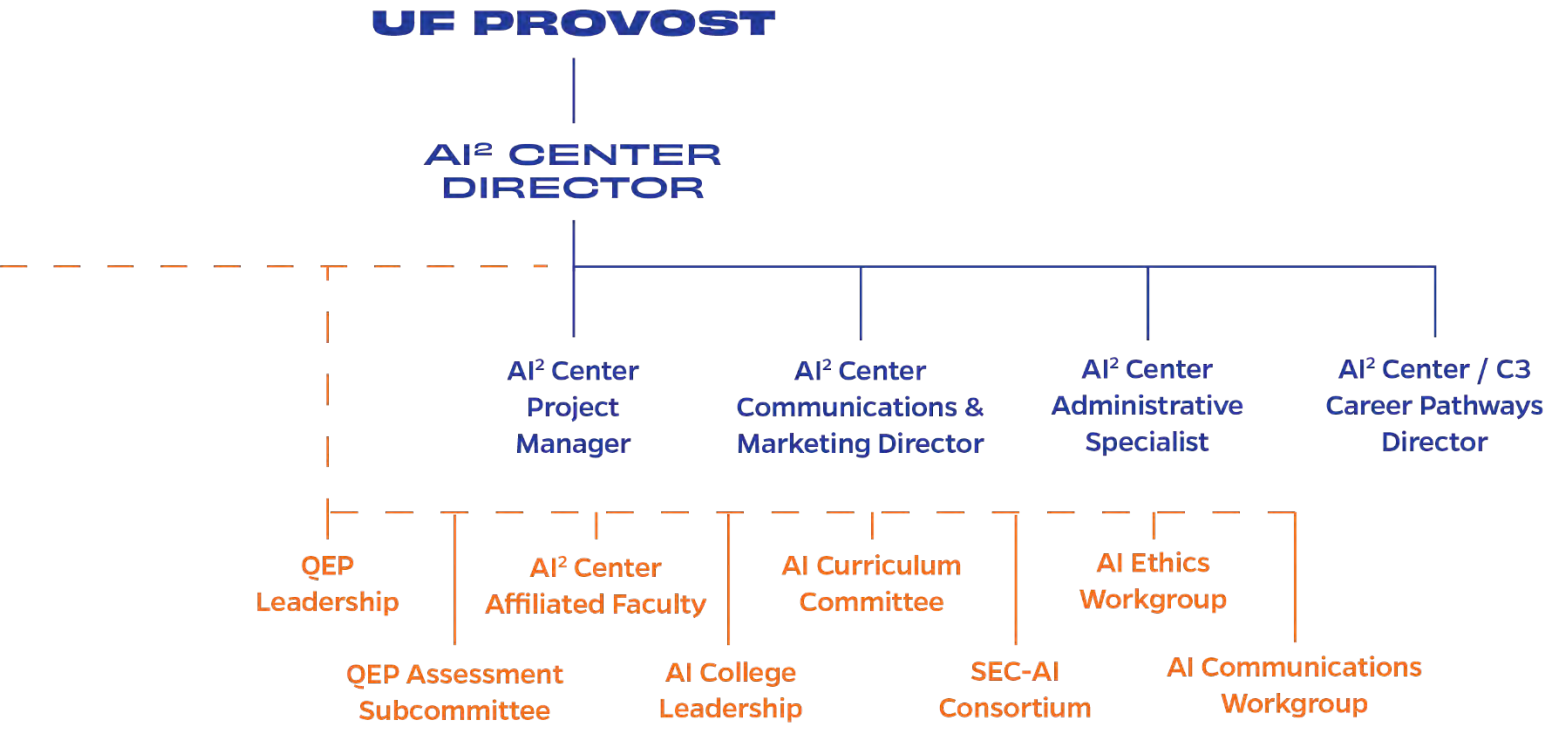
Results from these surveys provided valuable feedback that will be integrated into the implementation of the QEP. In addition to the group presentations, individual requests were made to the co-chairs to present the QEP *AI Across the Curriculum* information and to participate in Q&A. These include:

DATE	QEP AI ACROSS THE CURRICULUM PRESENTATIONS
February 10, 2022	Presentation to UF AI Curriculum Committee
February 21, 2022	K-12 Education Programs with Kim Jacobs (HWCOE)
February 24, 2022	QEP Meeting regarding undergraduate curriculum with Angela Lindner and David Reed.
March 7, 2022	UF Executive Committee meeting
March 16, 2022	QEP meeting with FIU regarding their recently implemented QEP
April 7, 2022	Faculty Senate Steering Committee Meeting to introduce QEP Initiatives
April 14, 2022	Faculty Senate Meeting to introduce QEP Initiatives and Name
May 11, 2022	Presentation to HWCOE Assoc Dean Curtis Taylor
May 11, 2022	Presentation to CLAS Chairs and Directors
May 23, 2022	Presentation to IFAS Chairs meeting
July 25, 2022	Presentation at UF's 'AI Communications Summit'
August 15, 2022	Presentation to CLAS Staff AI Discussion
September 23, 2022	Presentation to SEC Information Technology Group
November 4, 2022	Presentation to UF Alumni, Grand Guard Faculty Speaker
December 8, 2022	Presentation to UF BOT, AI in the Curriculum and the QEP
January 6, 2023	Presentation to University of Albany, AI Across the Curriculum
April 17-19, 2023	AI in Agriculture: Innovation and Discovery to Equitably Meet Producer Needs and Perceptions Conference
May 16, 2023	Testimony to House Future Forum Caucus regarding AI across the Curriculum
July 26, 2023	Presentation to AI College Leadership at UF

At the initial Task Force meetings, brainstorming of innovative and novel ideas was undertaken, and this process was then guided through more detailed discussions to develop a series of initiatives the Task Force determined to be appropriate for further development.

The initiatives in the QEP will be coordinated and assessed by the AI² Center. The Center Director reports to the UF Provost and the AI² Center has the following structure (Figure 3).

Figure 3. Proposed organizational chart structure



Leadership and guidance for the AI² Center is provided by various QEP AI workgroups and committees, consisting of faculty and university leaders who bring a diverse, multidisciplinary representation from across the university. The most comprehensive of these collectives are the AI² Center Affiliated Faculty. AI² Center Affiliates are faculty and administrators that span all UF colleges and programs with an interest in engaging with the AI² Center and all campus-wide AI-focused opportunities. Interested parties must be UF faculty or administrators and complete an online form to be reviewed by the AI² Center Project Manager, see submission form in (provided in Appendix C).

The initiatives to be implemented and a brief description of activities involved in each initiative are outlined below. As the QEP is implemented and assessed, initiatives and their activities will continually be updated to reflect new information and opportunities.

CURRICULUM DEVELOPMENT

The AI² Center will work with a new **AI Curriculum Committee (AICC)** specifically assigned to review AI courses and to identify courses by category and Core AI Literacy (described in Chapters 2 & 4). The subcommittee will be composed of faculty from different colleges and experiences and assigned by the Director of the AI² Center. Identifying AI courses and respective AI category will be used to assess the prevalence of different AI topics in the curriculum.

Faculty will submit courses for review to the AICC via the UF course approval system online form. The **AI course designation form** was developed based on standard course review forms with additional AI informational points. The online form is available within the UF course approval system (Appendix C). The AICC will review courses, approve, or disapprove faculty AI category designation, and provide feedback to faculty.

An **AICC course review checklist and guide** were created to help the AICC in their review process (provided in Appendix C)

Seed Grants will be available for course **development of new courses on AI** or existing courses to add an AI component. Seed grant call for proposals will be released annually from the AI² Center. The Director of the AI² Center will organize a subcommittee of the AI² Center Affiliated Faculty to review proposals submitted and select as funding allows.

The **Seed Grant Program** will also **encourage faculty pairing** – novice with AI mentor/expert to team teach and develop materials. Course types would include UF Online and UF Quest.

Courses designated as AI and courses benefiting from Seed Grants will be identified on the AI² Center website.

ACADEMIC PROGRAMS

AI-based academic programs (e.g., certificates, minors, majors, tracks) from across the university that include a variety of topics, domains, audiences, and levels of expertise will be **designated as an AI program by the AI² Center**.

The **academic programs** will be **catalogued for students** to easily find, advertised, and managed though the UF AI² Center, taking advantage of the established ai.ufl.edu website.

The **AI² Center website** will include a form to be completed by UF faculty to add an academic program to this list. The AI² Center Project Manager will **review submitted academic programs to determine their relevancy**. If needed, the AI² Center Project Manager will convey a group of **AI² Center Affiliated Faculty** to help develop this process and further define criteria for UF AI programs.

AI UNDERGRADUATE SCHOLARS AND MEDALLION PROGRAMS

The **AI Undergraduate Scholars program** will be based on the existing programs offered through the **UF Center for Undergraduate Research (CUR)**, including research opportunities directly between undergraduates and AI faculty programs and **course-based undergraduate research experience (CURE)**. The AI Scholars program and CURE will be coordinated with the UF CUR as offerings that specifically include AI. Students apply for these programs directly with the department or college, and processes are outlined on the UF CUR website by college. The AI^2 Center will coordinate with CURE and colleges to designate undergraduate research and CURE courses as AI through an approval process. Information on the approval process and an online form to seek approval will be available on the AI^2 Center website.
AI Scholars will be showcased during conferences and other professional events held by the AI^2 Center.

In addition to CURE, which is research-focused, team-based courses focused on an **industry presented challenge, will also be part of this program (I-CURE)**. Teams will be composed of students from different disciplines to solve a particular AI industry need. These I-CURE courses will be facilitated through the AI^2 Center and led by AI^2 Center Affiliated Faculty. The AI^2 Center Project Manager, in partnership with the **UF Career Connections Center** team, will manage industry connections and coordination with courses. Mentors for the AI Undergraduate Scholars program will be affiliates of the AI^2 Center.

AI Medallion Programs. Undergraduate AI Scholars will complete a series of courses, experiences, and other AI-related activities as designated by the AI^2 Center. Students meeting the minimum requirements will receive an AI Graduation Medallion to recognize them as AI Undergraduate Scholars during graduation. Additional activities and courses will include experiential learning in the form of internships and research for credit hours. To be **eligible** for the AI Medallion, **students must complete four of the following items**:

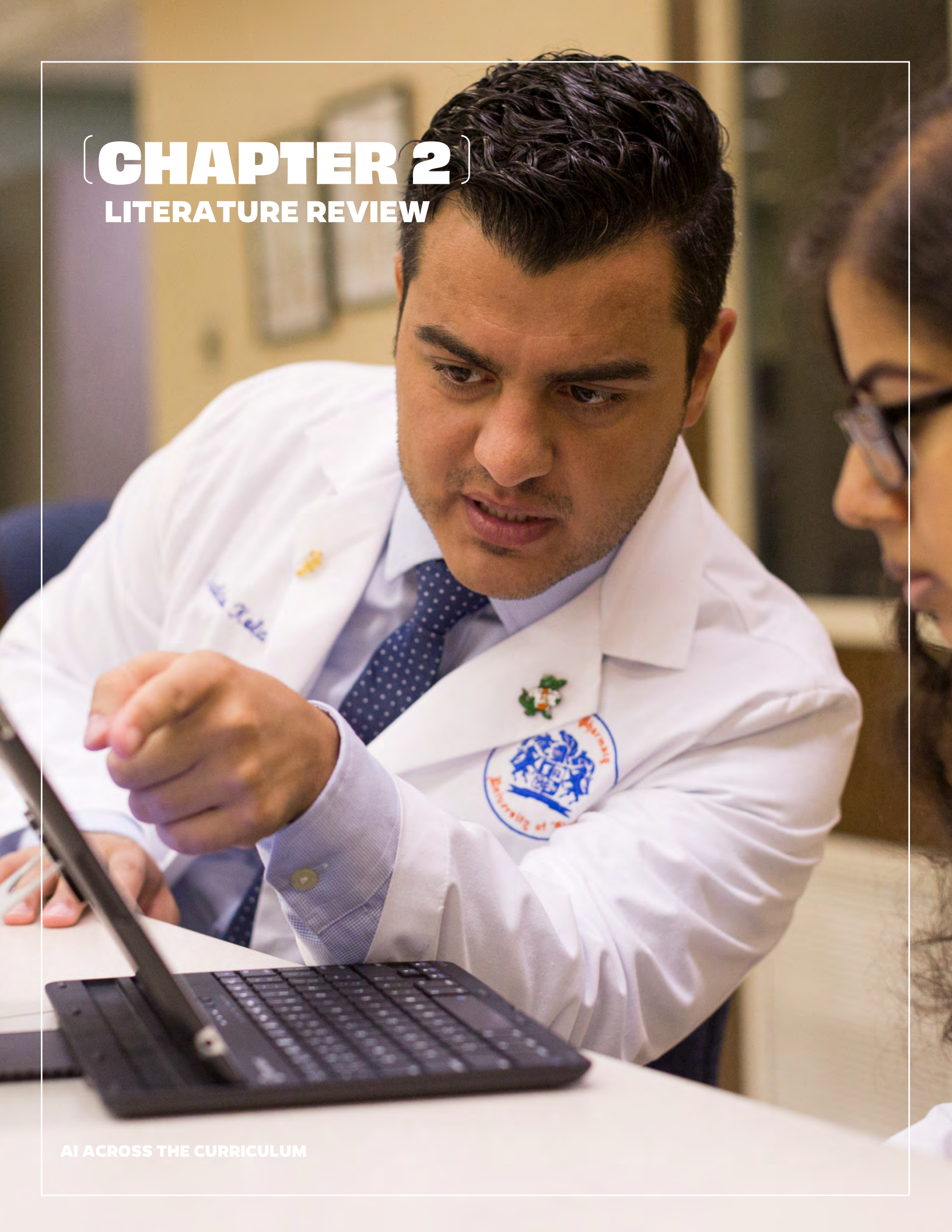
- AI Scholar
- AI CURE
- AI I-CURE
- Earn the UF Undergraduate AI Certificate in AI Fundamentals and Applications
- Present at a university AI^2 event (3MT, Poster, or Oral Presentation)
- Attend two AI^2 center events
- Complete an AI-based internship
- Complete nine credits of AI coursework with any of the AI literacies

Information on this program and how to apply for the AI Medallion will be provided on the AI^2 Center website. Applications and completion of required activities must be submitted by students at least one month prior to graduation. Applications will be reviewed by a **five-member subcommittee composed of AI^2 Center Affiliated Faculty**. The subcommittee will be appointed by the Director of the AI^2 Center. The activities for review will be organized by the AI^2 Center Project Manager. Once subcommittee reviews student AI Medallion applications, the AI^2 Center Project Manager will notify the AI Medallion students of application status. AI^2 Center Project Manager to source, order, and distribute AI Medallions, pickup or delivery, from the AI^2 Center.

CAREER CONNECTIONS CENTER AND WORKFORCE

The **Career Connections Center (C3)** will prioritize equipping students with the knowledge and connections needed for the AI-enabled workforce and will advance the university's AI initiative, as we partner with industry to create pathways for career development for students by:

- Providing education for students in preparation for the future of work: Educating students, ourselves, and campus about AI use in recruiting practices and changing workforce needs; Aiding students to articulate the AI competencies (skills, abilities, and personal attributes) they have developed at UF.
- Facilitating opportunities for AI to be applied in internships and experiential learning: Expose students to career pathways available in AI through internships and other experiential learning experience related to AI; To provide experiential learning opportunities for students; Working with faculty to showcase AI in the curriculum to address need for an AI ready workforce.
- The C3 will work with others across campus to launch the Comprehensive Learning Record (CLR) that highlights workforce skills acquired by undergraduate students related to AI.
- Employer input is conducted through C3, the AI^2 Center has a team member embedded within C3 to directly develop and track industry goals to fill the needed AI workforce.



CHAPTER 2
LITERATURE REVIEW

CHAPTER 2:
LITERATURE REVIEW

The literature related to the QEP on *AI Across the Curriculum* provides support for the topic and shows the innovation in the QEP proposal (Southworth et al., 2022). One of the more complex questions to answer when discussing AI is, "what is AI?" AI is a phrase used broadly and we provide some context for its changing meaning over time and its broad application which is relevant given the UF QEP across all disciplines approach. Next, literature exploring AI related pedagogy from a programmatic standpoint considering applications around the world is presented. Lastly, review of other QEPs with an AI or related component are summarized.

DEFINING AI

Artificial Intelligence (AI) has been part of science and technology for over 70 years with different terms, phrases and interpretations. Today, the concept of AI is still evolving but common ideas can be observed amongst the different definitions (Table 1). First, AI definitions often include a link to computers – or the non-human brain. The 'artificial' part of AI implies that the thinking is not done by a biological process (as humans think) but rather by machines or computers. Another commonality amongst definitions of AI is the idea that the computers/machines are problem solving or performing a task through a process that requires decision making. Lastly, definitions often include the word 'learn' or 'learning' showing that the computer creates something new from data or other information provided. These three elements appear central to most current AI definitions.

Table 1. Example definitions for Artificial Intelligence (AI)

DEFINITION	SOURCE
AI leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind.	IBM
AI is the capability of a computer program or a machine to think and learn and take actions without being explicitly encoded with commands. AI can be thought of as the development of computer systems that can perform tasks autonomously, ingesting and analyzing enormous volumes of data then recognizing patterns in that data.	NVIDIA
The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.	The Oxford English Dictionary

Another aspect often associated with AI is data, particularly large datasets or 'big data'. No matter the AI application, for example, smart cities (Allam & Dhunny, 2019), infectious diseases (Wong et al, 2019), and tourism (Samara et al., 2020), data is often an essential element to AI development and use. Datasets are used with AI to identify patterns for learning and make an AI algorithm 'smarter'. Generally, the greater the dataset represents the system in question, the more accurate the AI algorithm will be.

As technology continues to advance, how we define AI will likely also shift depending on the referenced application or discipline and the new innovations we have yet to create. However, for now we consider these definitions and a very broad approach to AI to encompass how it is applied and used across our daily lives (e.g.,

entertainment, shopping, traveling) and as a component of most sectors in the workforce (e.g., business, investments, legal industry, medical industry, technology industry). The infusion of AI across so many aspects of human life has created a need for us to not only be able to use AI (even when we do not realize it) but to also have a greater understanding of its broad applications, usefulness, limitations, and biases. Thus, there is a need for a concerted effort to educate across all sectors on AI to create a population better prepared to live and thrive in an AI enabled world, such as the one in which we now live, and which is rapidly evolving.

AI IN SOCIETY

The 21st century has brought with it unprecedented changes in our personal and professional lives. While advances in Artificial Intelligence (AI), which can be broadly understood as computational systems and toolsets which think and act rationally or in some cases like humans (Russell & Noruig, 1995), continue to expand across diverse fields from medicine to medieval literature, higher institutions are in a unique position to expand student competence in and awareness of AI. To stay relevant, higher education must adapt to meet the needs of this rapidly changing world. One area of particular importance is AI literacy (Kandlhofer et al., 2016; Luckin et al., 2022; Ng et al., 2021). AI is no longer just a concept from science fiction; it is increasingly becoming a part of our everyday activities and is changing the way we interact with the world around us (Cantú-Ortiz et al., 2020; Dai et al., 2020). As such, it is crucial that future generations have an accurate understanding of AI and its implications (Zimmerman, 2018). Despite AI expanding within the world-at large, the diffusion of AI across the curriculum for both undergraduates and graduates is sparse and inconsistent outside of the traditional Science, Technology, Engineering, and Math (STEM) fields (Cantú-Ortiz et al., 2020; Dai et al., 2020; Ma & Siau, 2018). In addition, recent educational researchers have argued that AI literacy is a minimum learning outcome for all post-secondary and K12 students (Kandlhofer et al., 2016; Luckin et al., 2022; Ng et al., 2021; Su et al., 2022). Incorporating AI into the curriculum can help to achieve this goal (Dai et al., 2020; Ng et al., 2021; Su et al., 2022). By providing all students with AI learning opportunities, we can empower them with the knowledge and skills needed to thrive in a world that is increasingly shaped by AI. Additionally, AI literacy can help to prepare students for jobs of the future (Kandlhofer et al., 2016; Long & Megerko, 2020; Ng et al., 2021). As AI becomes more prevalent in the workplace, those who understand and interface with AI will have a distinct advantage over those with less developed AI skills. Integrating AI into higher education is therefore essential for preparing students for the 21st-century workplace (Cantú-Ortiz et al., 2020; Ng et al., 2021; Southworth et al., 2022).

AI has been used for decades to assist with tasks such as voice recognition, handwriting analysis, image recognition, and natural language processing. AI is also becoming ubiquitous across society, from self-driving cars to smart homes and voice assistants; AI is changing how we interact with the world around us (Cantú-Ortiz et al., 2020; Hu et al., 2019; Ng et al., 2021). This means that AI is not something that will happen in the future but rather something that we are living through today (Cantú-Ortiz et al., 2020; Dai et al., 2020; Hu et al., 2019; Kandlhofer et al., 2016; Luckin et al., 2022). One study showed that only 33% of consumers surveyed claimed to have used AI for a specific task, which is shockingly low given that already 77% of devices we use feature some form of AI (PEGA, 2022). The most common of these tasks were making purchases, searching for information, and conducting research. The technological development of AI has had a significant impact on our society in work, education, and other aspects of daily life. Though there are many opinions about the implications of AI for society now and in the future, one thing is certain: AI's presence cannot be ignored (Cantú-Ortiz et al., 2020; Kandlhofer et al., 2016; Ng et al., 2021). Our society is more digitalized and automated than ever before. We will have to understand what AI is, and how it works to succeed in this new digital paradigm.

Thoughtful incorporation of AI into a curriculum is one approach for providing AI knowledge and skills to the next generation (Ng et al., 2021; Southworth et al., 2022). With a better understanding of what AI is and how it can be used, we can provide students with knowledge and skills that are needed for the 21st century (Buckingham Shum & Deakin Crick, 2016; Cantú-Ortiz et al., 2020; Dai et al., 2020; Luckin et al., 2022; Markauskaite et al., 2022; St Louis et al., 2021; Su et al., 2022). To meet this goal, higher education needs to integrate theories and applications of AI across the curriculum and disciplines, and not consider it as an 'add on' requirement that becomes a check box instead of an essential element to the curriculum. UF's new model was designed to create a

curriculum for students to succeed in acquiring their AI knowledge and skills related to identified AI literacy topics (Southworth et al., 2022).

The next generation of students requires competency in AI literacy to recast a new societal norm embracing AI and integrating it into daily tasks. Additionally, students need competency to interpret AI for success in their personal and professional lives (Kandlhofer et al., 2016; Ng et al., 2021). Learning about AI can provide students with insight into new career paths as well as potential mentors to further develop their credentials and workforce readiness. Thus, the AI literacy model we propose encourages interdisciplinary engagement, further expanding student experiences and career readiness skills (Zimmerman, 2018). The AI curriculum at UF, as well as other universities, does not exist independently from university research. Research activities are often integrated with teaching activities and each benefits from the other. The investment of universities in research to remain innovative and relevant in the technological race contributes to the quality of student learning and its ability to create translational career skills. AI is already being used in many different disciplines, and there is no question that it will be part of students' lives. Thus, greater AI competency in students will provide them with a greater potential for achievement (Borenstein & Howard, 2021; Cantú-Ortiz et al., 2020; Kandlhofer et al., 2016; Long & Megerko, 2020; Ng et al., 2021).

IDENTIFYING THE GAP - WHY DO WE NEED AI EDUCATION?

The technological innovations of the 21st century have created a world that fundamentally operates differently. These innovations have also generated new expertise and workforce needs that did not previously exist (Buckingham Shum & Deakin Crick, 2016; Cantú-Ortiz et al., 2020; Kandlhofer et al., 2016; St Louis et al., 2021). Some have referred to this as the Fourth Industrial Revolution and have identified the impact of these innovations on how we live and work (Ahmad, 2019; Ng et al., 2021). For example, the World Economic Forum (2022) described the Fourth Industrial Revolution as "merging the physical, digital, and biological worlds and fusing technologies in ways that create both promise and peril." Additionally, the Forum highlighted the need to integrate ethics when developing and using new innovations. This includes engaging public and private sectors to create recommendations for policies that embrace ethical practices in innovation and thus increase the benefits of AI innovations more broadly. The Forum also identified AI as a cross-disciplinary concept and as an intricate and developing component of our world in the 21st century (World Economic Forum, 2022). Likewise, governments have recognized the AI expertise needed to ensure future growth and stability. The 2021 National Security Commission on Artificial Intelligence (NSCAI) Final Report noted that "big decisions need to be made now to accelerate AI innovation to benefit the United States and to defend against the malign uses of AI." The report also identifies human talent in AI-enabled technology as the greatest barrier for the United States national security sector. The report further outlines the need to develop a digitally literate workforce with AI readiness by 2025 (NSCAI, 2021).

Not only has there been global and government recognition of AI as a topic to be explored across disciplines, the National Academies of Sciences, Engineering, and Medicine (NASEM) published a report titled "Data Science for Undergraduates: Opportunities and Options". This report outlined the importance for students of all backgrounds, disciplines, and professional goals to have the opportunity to learn data science. They identify different elements of data science including "the availability to understand data, making good judgements about and good decisions with data, and using data analysis tools responsibly and effectively" (NASEM, 2018, p. 138). Data science has an important role with AI. The two topics are often used together given that data science is the first step to creating or implementing AI methods, and the limitations or biases present in data will appear in the AI created solution (Borenstein & Howard, 2021; Long & Megerko, 2020). The acknowledged need by the NASEM (2018, p. 138) for all students to have this opportunity further emphasizes the necessity to educate and provide experiences across disciplines instead of focusing on a narrow subset of students having the opportunity to learn about data science. In a similar fashion, universities and colleges have embraced the importance of speaking and communication skills across all disciplines. Thus, precedent exists where a topic or skill has been shown to have broad need and therefore was integrated across college and university campus disciplines to benefit students and future employers (Cantú-Ortiz et al., 2020; Kandlhofer et al., 2016; St Louis et al., 2021). For our purposes, we consider AI to be inclusive of related data science.

Higher educational systems in the United States have evolved to prepare students to enter the workforce as a primary mission. As such, colleges and universities continually adapt the curriculum to align with employer

needs (Ahmad, 2019; Cantú-Ortiz et al., 2020; St Louis et al., 2021). One need clearly identified globally, and also specifically in the United States, is for individuals entering the workforce with greater AI knowledge and skills to meet 21st-century challenges (Buckingham Shum & Deakin Crick, 2016; Cantú-Ortiz et al., 2020; Kandlhofer et al., 2016). The NSCAI Report (2021), along with the NASEM report (2018) and the World Economic Forum (2022), all provide a consistent mandate for modifying university curricula to meet the knowledge and skills workforce needs (Southworth et al., 2022).

AI IN HIGHER EDUCATION

The infusion of AI across so many aspects of human life has created a need for us to not only be able to use AI (even when we do not realize it) but to also have a greater understanding of its broad applications, usefulness, limitations, and biases. Thus, there is a need for a concerted effort to educate across all sectors to create a population better prepared to thrive in our rapidly evolving AI-enabled world (Cantú-Ortiz et al., 2020; Dai et al., 2020; Zimmerman, 2018). Even as some AI specialists openly speculate that a fundamental understanding of AI is not necessary, we believe it is critical to provide everyone with fundamental knowledge related to AI and its diverse and ever-increasing applications (Borenstein & Howard, 2021; Dai et al., 2020; Kandlhofer et al., 2016; Long & Megerko, 2020; Ng et al., 2021). This includes creating greater opportunities for scientists, engineers, medical professionals, and everyone who deals with data and information to understand the basics of machine learning, deep learning, and the various AI techniques that are impacting our lives. Note, we are not suggesting that every student needs to have a Ph.D. in AI or machine learning. We are, however, suggesting that there is a need for greater education across the spectrum of societal needs (Ng et al., 2021). It is particularly the responsibility of educators – who are generally reflective practitioners – to understand the ramifications of implementing AI in the educational system and to take active steps to prepare students for their roles as stakeholders and citizens in a world defined by the interaction of technologies (Zimmerman, 2018; Southworth et al., 2022).

At the time this plan was developed, the incorporation of AI within the curriculum has been restricted to certain STEM disciplines and fields, such as data science, computer science, and engineering (Cantú-Ortiz et al., 2020; Kandlhofer et al., 2016). While these are important disciplines and are clearly those where programming and AI development expertise often reside, it has also become apparent that there is a critical need for broader AI education campus-wide (Ng et al., 2021). Looking at existing programs in AI education, institutions of higher education currently have very limited campus-wide AI initiatives. AI is not simply a set of tools that can be considered in isolation, as technologies often are. Instead, it is a comprehensive set of skills or approaches for transdisciplinary inquiry, and it encompasses, or should encompass, the full life experience and education of a learner. AI should be built into the fundamental curriculum goals of a university. Some programs have embraced this cross-disciplinary idea such as

University of California, San Diego, the University of Washington, and the University of California, Berkeley. However, a considerable lack of depth and breadth still exists when it comes to AI education, which is a critical issue since AI is not simply a computational discipline. Rather, AI is a pedagogical challenge as it represents a broad array of fundamental skills and approaches, as well as significant and important questions of ethics and bias, and as such, should be an important part of any quality higher education curriculum (Cantú-Ortiz et al., 2020; Ng et al., 2021).

To consider how AI Across the Curriculum initiatives could be developed, we can learn from K-12 curricula that have some experience incorporating the rapid expansion of technology, and specifically AI, into education (Chiu & Chai, 2020; Kandlhofer et al., 2016; Xia et al., 2022). This formal incorporation of AI into the K-12 curricula has been occurring both nationally and internationally. United States entities including Google for Education, Microsoft K-12 Education Transformation Framework, the National Science Foundation, and a whole suite of computer-based special interest and education groups have been part of the development and call for technology integration in K-12 student curricula. This process is ongoing, and while they are currently at the beginning stages of developing such programs, institutions of higher education can certainly learn from these guidelines, curricula, tools, and resources (Lee et al., 2021).

The movement to incorporate AI in education has arisen in various countries in recent years (Cantú-Ortiz et al., 2020). For example, in 2017, China's State Council announced its intention to include an AI curriculum in primary and secondary education and set the goal of becoming a world leader in AI by 2030. In 2018, AI was officially introduced into the curriculum by the Education Ministry, and the first AI textbook was utilized (Chiu & Chai, 2020; Dai et al., 2020; Su et al., 2022). Singapore has developed AI education opportunities for both teachers and students, with the creation of two AI programs: “AI for Students,” which looks at facilitating AI formal and informal learning for secondary school students, and the “AI for Kids” (AI4K) program, which trains both schoolteachers and parents to become AI Bootcamp instructors for primary students. At the same time, in 2018 the government announced “AI Singapore” to develop students' capabilities in AI (Su et al., 2022). Likewise, programs in K-12 in Hong Kong, Japan, and Korea were developed from 2017 to 2019, all aimed at incorporating AI education into school curricula, although some of these are focused more on technology skills and development, more than a holistic understanding of AI (Xia et al., 2022). In 2020, the European Union developed a white paper on “Artificial Intelligence—a European approach to excellence and trust” and now plans to incorporate AI at all levels of education. However, even with all these national-level developments, there is still a lack of consistent approaches or even agreement on AI curricula and content to be covered (Chiu & Chai, 2020; Dai et al., 2020; Kandlhofer et al., 2016; Ng et al., 2021; Su et al., 2022; Xia et al., 2022).

There are currently a few university-level resources that represent a more comprehensive approach to incorporating AI into the curriculum. Stanford University launched a new institute for Human Centered Artificial Intelligence (HAI, announced in 2019). Their institute includes building partnerships with a wide range of entities with a goal of a better future for humanity through AI and a specific focus on becoming an interdisciplinary global

hub for AI (https://hai.stanford.edu/). Likewise, Northwestern University focuses on curriculum availability for educating university students and workforce professionals on AI theory, practice, and impact (https://ai.northwestern.edu/education/index.html). However, these programs are found only in their computer science and electrical and computer engineering departments. Other universities such as Harvard, Massachusetts Institute of Technology, and Carnegie Mellon have created courses or programs that are centered around the study of the ethics and implications of AI. All of these initiatives, whether at lower school (or elementary), upper school (middle and high schools), or within select programs and higher education, lead us to ask, 'What are the most effective and useful programs that infuse AI concepts across a curriculum and within all disciplines within higher education?' From a simple review of the literature and the ubiquitous nature of AI already within society, evidence shows we are at a critical moment in which we must educate all students with basic concepts and knowledge of AI. How then will institutions of higher education build AI curricula ready to face the challenges of the 21st-century and ensure our students graduate with the knowledge and skills to not only survive but thrive in the 21st-century workplace? (Ahmad, 2019; Borenstein & Howard, 2021; Cantú-Ortiz et al., 2020; Dai et al., 2020; Kandlhofer et al., 2016; Long & Megerko, 2020; Ng et al., 2021; St Louis et al., 2021). The lack of comparable case studies at other institutions in the United States or more globally, highlights the relevancy and timeliness of this academically inclusive model of AI Across the Curriculum. While this program is currently in development and implementation at UF, future evaluation and assessment of the model outcomes and goals will be of critical importance. Laupichler et al. (2022) reported on 30 studies (from 902 initial records) describing how AI literacy was being taught in higher and adult education. They found the research to be in its infancy and identified the need for refinement of concepts and materials. In addition, none of these reviewed studies portrayed campus wide initiatives, again highlighting the novelty of the proposed QEP and current lack of comparable case-studies for this model of AI Across the Curriculum instituted at a major university of higher education (Southworth et al., 2022).

The University has already invested in AI development and engagement across campus, built a world-class faculty well-versed in the concepts, and assembled a technical staff of AI specialists to assist faculty and students in using the latest AI supercomputer. Educators are forward-thinking visionaries who are creating a curriculum for the 21st-century. UF will enable students to be ready for that future and engage with it. An investment has been made in the fundamentals that are necessary to infuse AI across all disciplines and to build a curriculum that will empower students to be at the forefront of the wave of technology (Southworth et al., 2022).

| AI ACROSS THE CURRICULUM AT UF

AI PEDAGOGY

AI pedagogy refers to the methods and strategies used to teach artificial intelligence (AI) to students. It encompasses not only technical skills related to AI programming and algorithms, but also the broader concepts and principles of AI, such as machine learning, natural language processing, and robotics. One important aspect of AI pedagogy is the emphasis on hands-on, experiential learning. This can include working on projects that apply AI techniques to real-world problems, participating in hackathons or coding competitions, and engaging with open-source AI communities. These activities not only help students learn technical skills, but also foster creativity, critical thinking, and problem-solving skills that are essential for success in the field of AI.

AI literacy, on the other hand, which was first coined as a term in 2015 by Konishi (2015), refers to the knowledge and understanding of AI that is necessary for individuals to participate in the broader discourse around AI and make informed decisions about its use and implications (Laupichler et al., 2022). This includes an understanding of the capabilities and limitations of AI, as well as its potential impact on society and the ethical considerations involved in its development and deployment. Developing AI literacy is important for a number of reasons, most already discussed above. For one, AI is increasingly being integrated into various aspects of our lives, from self-driving cars to virtual assistants, and technology users should have the knowledge and understanding to make informed decisions about the use of these innovations (Lee et al., 2021). In addition, as AI continues to advance, it will likely have a significant impact on the job market and the nature of work, and thus, our students benefit when graduating with the knowledge and skills to adapt and thrive in this changing landscape (Laupichler et al., 2022). In a review by Laupichler et al. (2022) the authors note that research on AI literacy is still very young and as such there is little literature available on this topic. Li (2021) discusses how definitions of AI literacy are currently lacking. Again, this highlights the necessity for building a strong model of AI literacy within higher education, that is potentially transformative of how we incorporate AI pedagogy across the curriculum. It also serves to highlight the importance of future assessment and reporting on UF's AI Across the Curriculum initiative in terms of its successes and failures as a program focused on addressing AI literacy needs campus wide.

UF AI LITERACY MODEL

In higher education, AI is currently used to enhance the learning experience and improve student outcomes and is collectively referred to as Artificial Intelligence in Education (AIED). There are several approaches to using AI in higher education, including using AI to personalize learning, facilitate communication, and enhance assessment (Chen et al., 2020; Hwang et al., 2020). AI can be used to create customized learning experiences based on the individual needs and abilities of each student. This can be accomplished through adaptive learning algorithms, which adjust the content and pace of the learning material based on the student's progress. Personalized learning can help students stay engaged in the material, leading to better outcomes. Another approach to using AI in higher education is to facilitate communication. It can be used to create virtual assistants or chatbots that help students communicate with their instructors and classmates. These assistants provide support and answer questions, freeing up instructors to focus on more complex tasks. AI can also be used to create virtual reality environments where students practice skills and interact with others in a simulated setting. Finally, AI can be used to enhance assessment in higher education. AI algorithms can be used to grade essays and other written assignments, freeing up instructors to focus on providing feedback and helping students improve. Likewise, it can assist in creating adaptive tests that adjust the difficulty of the questions based on the student's progress, allowing for more accurate assessment of their knowledge. More recently, the metaverse concept (think of a fully or partially virtual world where social activities such as discussions, collaborations, games etc. can occur) has been introduced to expand the use of AIED and it is expected that more research and case studies related to such metaverse-based education will be reported in the future (Hwang & Chien, 2022). Overall, AI has the potential to significantly improve the learning experience in higher education. By personalizing learning, facilitating communication, and enhancing assessment, AI can help students learn more effectively and achieve better outcomes. While AIED has been

established as a field for over 30 years, this paper deals with a different emphasis of AI in Education – that of training students and our future workforce in AI pedagogy such that graduating students are AI literate.

AI literacy is the ability to understand, use, evaluate, and ethically navigate AI (Long & Megerko, 2020; Laupichler et al., 2022). There are four key areas of AI literacy. 1) Knowing and understanding AI involves understanding the basics of what AI is and how it works. This includes knowledge of machine learning algorithms, the data that is used to train them, and the limitations and biases that can be present in AI systems. 2) Using and applying AI involves the ability to use AI tools and platforms to solve problems and accomplish tasks. This may involve coding and programming skills, as well as the ability to understand and work with large datasets. 3) Evaluating and creating AI involves the ability to assess the quality and reliability of AI systems, as well as the ability to design and build AI systems that are ethical and fair. This requires a deep understanding of the technical aspects of AI as well as an understanding of the social and ethical implications of AI. 4) AI ethics involves understanding the moral and ethical implications of AI and being able to make informed decisions about the use of AI in various contexts. This includes considerations of fairness, transparency, accountability, and the potential impacts of AI on society and individuals. Overall, being literate in AI requires a combination of technical knowledge and understanding of the social and ethical implications of AI (Yi, 2021). Individuals and society as a whole benefit from being aware of the capabilities and limitations of AI which allows for responsible and ethical use (Borenstein & Howard, 2021; Dai et al., 2020; Kandlhofer et al., 2016; Long & Megerko, 2020; Ng et al., 2021; Zimmerman, 2018).

The foundation of the UF model is based on these four AI literacies as outlined in the previous paragraph and discussed in more detail by Ng et al. (2021). A fifth category, "Enabling AI", was also identified to capture academic courses that support AI through related knowledge and skill development (e.g., programming, statistics) and/or contain a lower total AI content of one of the four Core AI literacy topics. Each of these categories contains a variety of knowledge and skills that students can learn through different types of experiences. For example, students might learn about AI through reading texts, watching videos, or attending lectures. Alternatively, students might learn about AI through hands-on experiences, such as coding projects or data analysis. The UF model is designed to first clarify the different AI literacies presented in different academic activities (Dai et al., 2020; Kandlhofer et al., 2016; Long & Megerko, 2020; Ng et al., 2021). This allows students to build their expertise by selecting courses focused on literacies of their interest. Second, the UF model provides students with identified AI literacies by course that can be packaged to showcase student AI skills and 21st century competencies (Buckingham Shum & Deakin Crick, 2016; Cantú-Ortiz et al., 2020; Ng et al., 2021). Lastly, the course AI identification approach allows review of course offerings to identify gaps or needs to ensure AI learning opportunities are available for all undergraduate students.

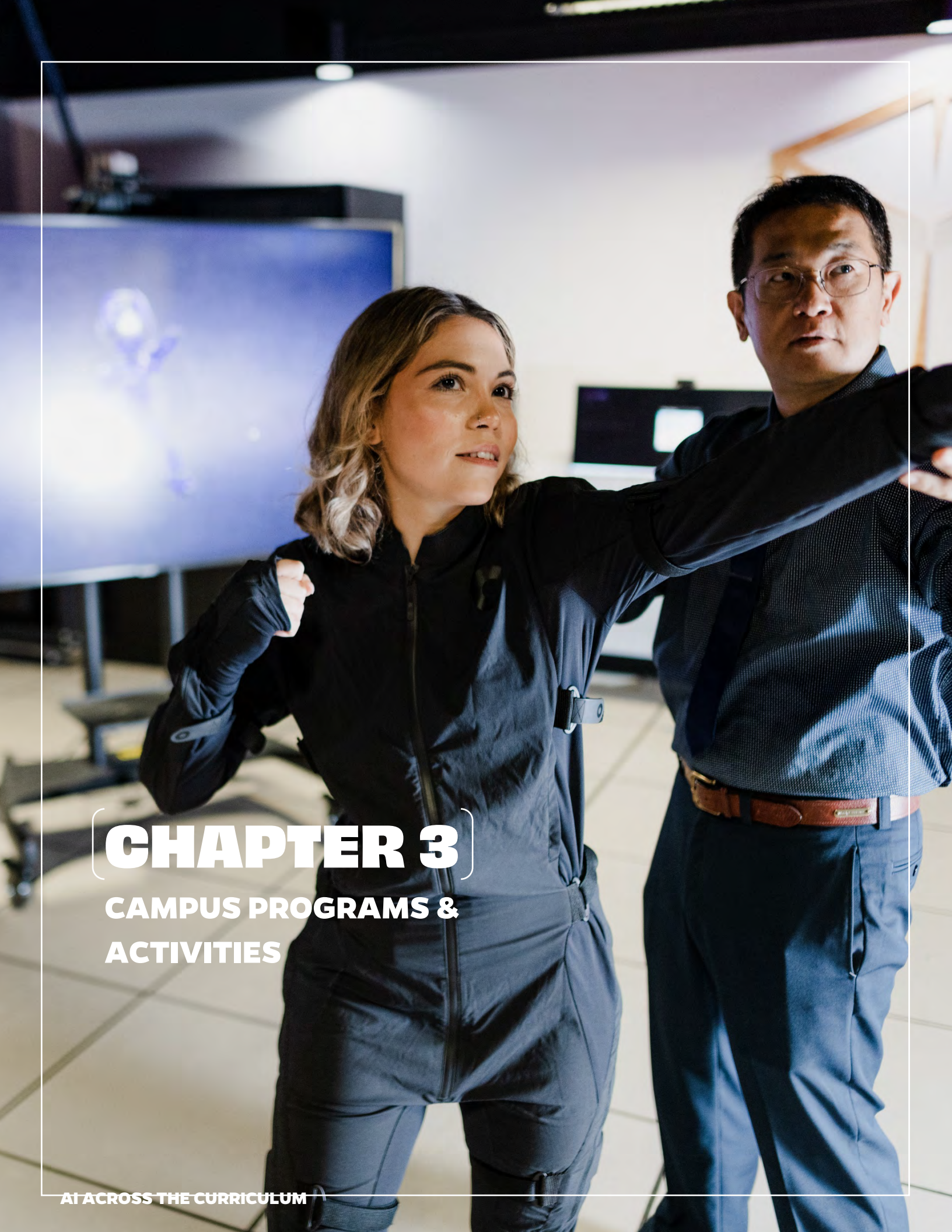
AI AND RELATED QEPS

Other institutions accredited by SACSCOC have proposed similar QEP topics. They are summarized here. The most recent and similar QEP to the one proposed by UF for 2024 is the Florida International University (FIU) 2021 Critical Skills for the 21st Century QEP. Their QEP goal was to align curriculum with career needs to ensure employment readiness, post-graduate success, and workforce and industry advancement. To achieve this, the FIU QEP proposed three micro-credentials that focus on critical skills for the 21st-century workforce:
(1) Artificial Intelligence: How it Works and Its Impact, (2) Thinking and Communicating with Data, and (3) Understanding Emotional Intelligence. The micro-credentials were delivered online with student learning outcomes.
Other recent QEPs that relate less directly to the proposed UF QEP include:

- *I-Know Digital Information Literacy* (Texas A&M University-Corpus Christi)
- *College to Career: Career Readiness through Everyday Competencies* (Georgia State University)
- *Connect the Dots: Quantitative Reasoning* (Texas A&M University – San Antonio)
- *Connect the DOTS: Digital, Online, and Technology Skills* (River Parishese Community College)
- *Think 2 Impact: Developing Critical Thinking Skills* (Montreat College)

The limited focus of advanced technology (or AI) and its application in previous QEPs further highlights the opportunity and novelty proposed in the UF QEP. Florida International University (FIU) is one institution with a similar topic. The UF QEP differs from the FIU one substantially but does include overlapping themes of data science and AI. Thus, not only will the UF QEP for 2024 bring opportunities to UF students but also an example pedagogy that can be reproduced or borrowed from by other institutions (Southworth et al., 2022). The pedagogy we propose removes barriers often present at universities due to a silo structure and provides a more direct link between student learning and professional employment experiences; this pedagogy uses AI as the vehicle to create this cross-cutting and inclusive learning environment.

The UF QEP AI Across the Curriculum has received global interest. UF's AI Across the Curriculum QEP plan was presented to the Southeastern Conference Chief Information Officers IT Meeting in Fall 2022. In addition, other universities are reaching out directly to UF and arranging campus visits to learn more about the QEP and Broader AI Program at UF. Examples include the University of Albany (January 2023) and Shiga University, Japan (February 2023).



CHAPTER 3

CAMPUS PROGRAMS & ACTIVITIES

CHAPTER 3:
CAMPUS PROGRAMS AND ACTIVITIES

This chapter provides a more detailed description of current programs and activities at UF that include AI or provide a similar structure to a proposed program or activity within the QEP *AI Across the Curriculum*. The QEP *AI Across the Curriculum* will expand programs and activities already under way at UF. Plans for expanding the four initiatives are included in this chapter.

The AI^2 Center provides leadership, organizational structure, and a programmatic home for the proposed QEP initiatives. The Center Director reports to the UF Provost, which ensures that QEP activities are implemented across all university colleges and stakeholders instead of being housed in one college that might give an image of being less broadly implemented. The AI^2 Center will not only oversee QEP initiatives, but also other academic-related AI activities providing for additional synergy amongst these groups.

Many courses at UF already include an AI component. And, with the new >100 faculty hires in AI expertise – more courses will be developed. Resources have also been provided to encourage AI incorporation into courses such as the free use of HiPerGator and faculty workshops and trainings. UF Research Computing provides information and support on using the HiPerGator. The UF Informatics Institute has organized and hosted many of the workshops on AI.

To better track AI curriculum, UF started to identify courses and enrollment in AI-designated courses in 2021 at the undergraduate and graduate levels. This effort was led by the UF AI Curriculum Working Group that was established to jump start AI Across the Curriculum and led by Associate Provost David Reed. The process being used was simplistic and consisted of a college indicating a course should be considered an AI course. This method is a good elementary start but does not provide the details and learning outcomes desired to assess the impact of AI content in courses on student learning and post-graduate success. A number of programs have incorporated AI into their curriculum already, with required courses introducing AI to all majors. Two examples of this are in the Business and Geography areas, where new required courses on AI have been added to the degrees, and AI modules interspersed across courses have been developed. Many other programs plan to follow suit by adding required courses on AI to their curriculum, and these will be monitored over the duration of the QEP.

Currently, several AI course-based certificates are available, but most are not distinguished formally as AI. An exception is the UF Undergraduate Certificate in AI Fundamentals and Applications. This certificate consists of two required courses, one in fundamentals and one in ethics, and a college-specific course. The certificate is open to all undergraduate students and housed in the Department of Engineering Education. The certificate was launched in 2021 as truly a cross-disciplinary certificate. Other certificates are being developed across campus that are more discipline specific or college specific. To date, these have not been catalogued and/or reviewed to be identified as an AI certificate. Several different scholar programs currently exist at UF.

UF also has a broader UF undergraduate research program that is organized by the Center for Undergraduate Research (CUR). The CUR program facilitates undergraduate research across the university that is mentored by faculty. The mission of CUR is "to foster a culture of research that encourages all students to include a research component as a critical part of their undergraduate experience." Students register for undergraduate research credit when participating in CUR, have the opportunity to apply for scholarships, present their research, and publish their research. The UF CUR oversees Course-Based Undergraduate Research experience (CURE) courses.

The general education program for undergraduates at UF also has launched UF Quest, a series of courses from Quest 1 to 4 that focus students on the big pressing issues and questions of our time. Quest 3 is focused on 'Engagement in the World' and includes internships or co-ops, research, public service, study abroad, community

service, and design and competition. Students enroll in this experience for 0 to 3 credit hours. Quest 3 provides a framework for AI Undergraduate Scholars and for AI Undergraduate Medallion programs through AI specific engagement in the previously mentioned activities. In 2022, UF provided $3,000 for faculty to develop a Quest course, and the AI^2 Center provided an additional $3,000 if the course was an AI course for Quest 1 and Quest 2.

The Career Connections Center (C3) at UF has actively implemented programs for improving AI-related career development. The C3 has developed and hosted educational workshops on "AI and the Job Search". These workshops focus on practical strategies for students to understand how employers might be using AI in their recruitment process, as well as how students can leverage their job search using AI strategies. It is now a part of C3 regularly scheduled workshops hosted each semester. In the 2021-2022 academic year, C3 hosted at least six educational workshops for students related to AI. C3 also hosted a Faculty and Staff Symposium in July of 2022 to provide a space for conversations focused on emerging trends that impact students' workforce readiness and the role faculty and staff play in preparing UF students for the future of work. The keynote topic was "The Importance of AI Literacy for Students Entering the Workforce" and a breakout session titled "Artificial Intelligence in Recruiting – Best Practices for Beating the Algorithm."

The C3 launched Quinncia in the fall of 2022. Quinncia is an interactive artificial intelligence-based solution that provides students with 24/7 access to resume reviews and customized AI practice interviews. The Quinncia system is based on Applicant Tracking Systems (ATS) and artificial intelligence interview systems used by employers, ensuring feedback provided to students is relevant to current industry processes. This platform aids the C3 in fulfilling the vision for each UF student to have a meaningful career experience while pursuing their degree. It also allows the C3 to provide experience in AI to all students, helping to secure UF's mission to become a leader in artificial intelligence in higher education.

The Assistant Director for AI Career Pathways is a career services professional serving as an embedded liaison between the university's AI^2 Center and the C3. The position proactively engages and collaborates with campus partners, employers, faculty, and alumni to support and assist in the development, direction, administration, and promotion of customized career development services for UF students with an emphasis in artificial intelligence. The director supports undergraduate and graduate students' post-graduation plans by developing, implementing, and assessing programs and resources to foster career exploration, experiential learning, and workplace readiness.

The C3 also has been training staff (including student assistants) to educate students about AI considerations through career coaching appointments, peer-to-peer engagement, and Express Drop-In or open hours for prompt support. Career coaches and student employee peer ambassadors discuss how UF students should customize their application materials to stand out within the Applicant Tracking System. In addition, the C3

staff are trained to support students in AI-supported interviewing systems. The C3 has added these considerations to our updated handouts and websites for student education and campus awareness.

The AI2 Center Team will partner with the Career Connection Center (C3) to create a targeted and widespread campaign to ensure all undergraduate students at UF, regardless of background or major, have awareness and access to AI educational programs and opportunities. This effort will be led by the AI2 Center team member embedded within C3 utilizing the following databases and communication tools available to them:

- **CareerHub powered by UConnect**: a student database with communities and social identities for various student populations.
- **Gator CareerLink**: an integrated platform to communicate directly with various students and student groups.
- **C3 staff**: Many C3 staff liaise with departments such as Disability Resource Center, Center for Inclusion and Multicultural Engagement, Office of Academic Support, and more.
- **UF AI Student Club and AI Student Engagement Work Group**: these student and faculty/staff entities are newly created and led by the AI2 Center.

UF has a requirement that students entering the university must be able to earn nationally recognized digital credentials (such as badges) for competencies within the general education core courses that demonstrate career readiness. UF created a Task Force in 2022 dedicated to the effort of developing the process for such credentials. The second phase of this effort plans to explore the development and launch of a Comprehensive Learner Record (CLR) as a complementary skills-based document for students to use with their transcripts. This effort is led by the Vice President for Enrollment Management and Associate Provost.

The Center for Instructional Technology & Training (CITT) is available to assist instructors for AI courses with their instructional design needs. Services include instructional design consultations, accessibility consultations, and course development. They also have committed to providing services to AI faculty specifically related to assessing SLOs in Canvas structure. The CITT also creates training materials and conducts webinars to facilitate their services. They are committed to assisting in this capacity with the AI courses and the SLO assessments for the QEP.

CHAPTER 4

STUDENT LEARNING OUTCOMES

CHAPTER 4:
STUDENT LEARNING OUTCOMES

The 2018 National Academies of Sciences, Engineering, and Medicine (NASEM) published a report titled *Data Science for Undergraduates: Opportunities and Options*. This report outlines the importance for students of all backgrounds, disciplines, and professional goals to have the opportunity to learn data science. They identify different elements of data science including "the availability to understand data, making good judgements about and good decision with data, and using data analysis tools responsibly and effectively" (p. 12). Data science has an intricate role with AI.

The 2021 National Security Commission on Artificial Intelligence (NSCAI) Final Report noted that "big decisions need to be made now to accelerate AI innovation to benefit the United States and to defend against the malign uses of AI" (p. 1). The report also identifies human talent as the "most conspicuous AI deficit and the single greatest inhibitor to.... AI-enabled technologies for national security purposes" (p. 3). The report further outlines the need to develop a digitally literate workforce with AI readiness by 2025 (NSCAI, 2021).

The World Economic Forum has identified a mission focused on AI and machine learning. "The World Economic Forum is committed to helping ensure that these systems emphasize privacy and accountability, and foster equity and inclusion. We aim to bring together the public and private sectors to co-design, test, and implement policies that increase the benefits of artificial intelligence and machine learning – while developing projects to protect the vulnerable and address issues like facial-recognition technology." The Forum has identified AI as cross disciplinary and as an intricate and developing component of our world (Figure 4).

As with national and global priorities focusing on workforce needs in AI and data science, the state of Florida also has recognized career readiness competencies as outlined by the National Association of Colleges and Employers. These competencies include career and self-development, communication, critical thinking, equity and inclusion, leadership, professionalism, teamwork, and technology. The competencies align with the AI academic initiatives proposed and with the developed student learning outcomes (SLOs).

| CONCEPTUALIZING AI LITERACY

Higher education pedagogy focuses on the refinement of knowledge and skills as a student studies a topic or pursues a degree, such as engineering, geography, medicine, or economics. While this traditional pedagogy is useful in many regards, limitations are evident; specifically, the lack of student engagement across interdisciplinary teams more reflective of a workplace environment or with industry partners, and students gain little exposure to time-sensitive, real-world challenges. While some programs may require teamwork, activities, and industry linkages, the interdisciplinary cross college focus is rare. UF has also tried to encompass the focus on real world challenges with such requirements as Quest courses, which are designed to engage students to "examine questions about the human condition that are difficult to answer and hard to ignore" UF Quest - UF Quest - University of Florida (ufl.edu). However, we hold that higher education curricula can be improved by identifying a mechanism to link disciplines and address these limitations. AI offers a timely and relevant mechanism that faculty can engage within their courses to bridge this gap. Not only does AI provide this unique opportunity for faculty to develop transformative pedagogy, but there is a global and national need for a workforce trained in AI. The problems society faces are truly complex, and viable solutions often depend on integration of domain expertise with powerful tools such as those found in AI. Developing these solutions requires investment in faculty time and resources to develop courses and experiences in which students have the opportunity to develop such convergent thinking.

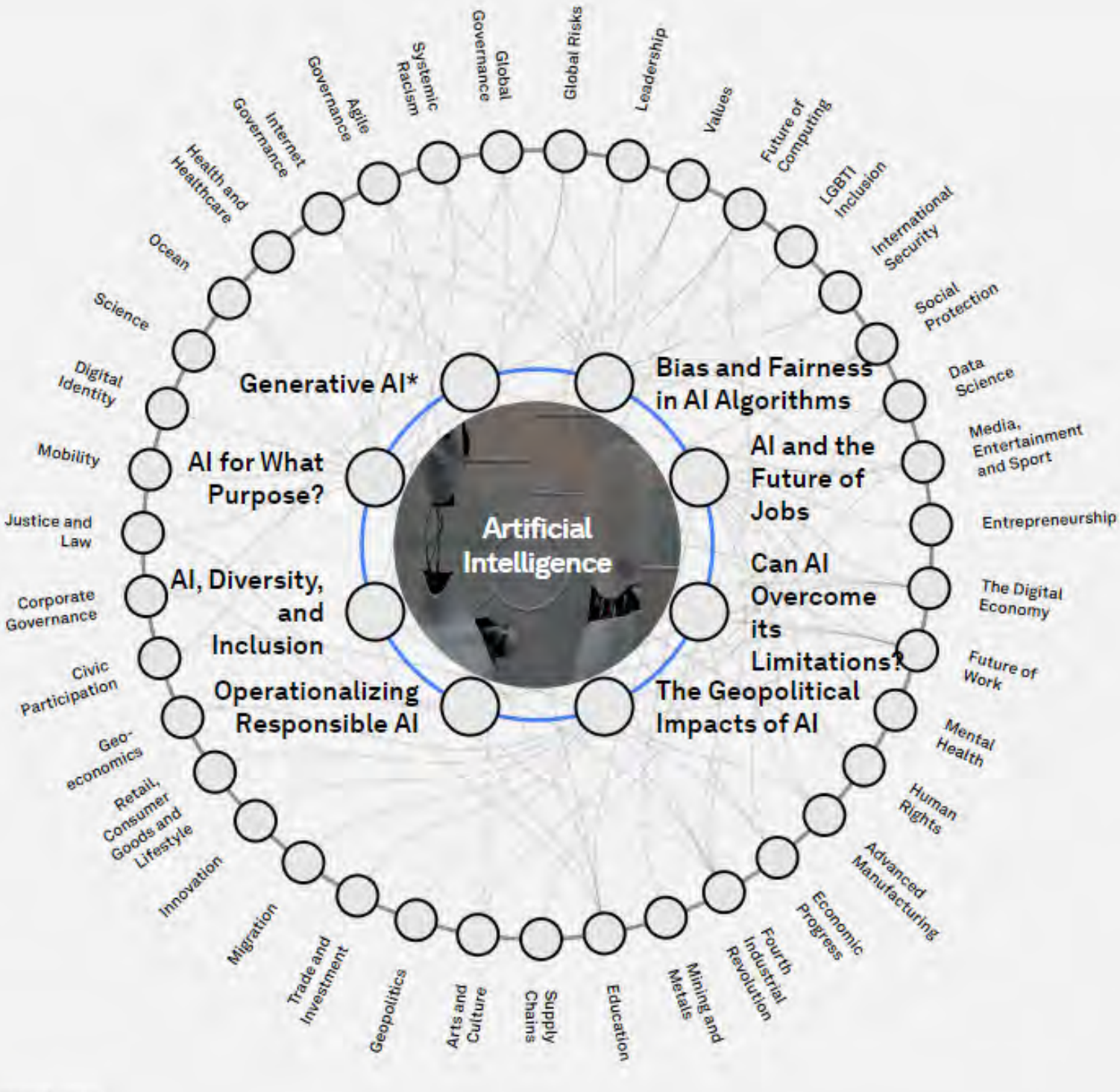


Figure 4. Diagram from the World Economic Forum showing the connection of AI across topics and disciplines and its potential to help solve complex challenges *Strategic Intelligence (weforum.org)*

The foundation of the UF artificial intelligence course categorization model is based on the four AI literacies outlined by Ng et al., (2021). These are: 1) know and understand AI, 2) use and apply AI, 3) evaluate and create AI, and 4) AI ethics. These four core AI literacies categorize the types of knowledge, skills, and competencies that students gain through their higher education learning experiences. For example, to demonstrate they "know and understand AI", students need to explain what AI is and its potential implications in formats appropriate to the discipline. To "use and apply AI", students must gain the requisite skills and experience to select and use AI tools for problem-solving. To "evaluate and create AI", students must know the processes and procedures to assess the impact of AI and be provided a supportive environment that enables them to create new AI applications. Finally, to be AI literate, students must know the ethical implications of AI, known as "AI ethics" (Borenstein & Howard, 2021; Dai et al., 2020; Kandlhofer et al., 2016; Long & Magerko, 2020; Ng et al., 2021; Zimmerman, 2018). We added a fifth literacy category, "AI Enabled", which identifies academic courses that support student AI learning through related knowledge, skill, and competency development and/or contain minimum AI content in one of the four core AI literacy topics.

Each of these categories requires that students acquire and apply a variety of knowledge and skills through different types of experiences (Figure 2). For example, students might read texts, watch videos, or attend lectures that focus on artificial intelligence in their discipline or program. Alternatively, students might engage in hands-on experiences, such as coding projects or data analysis. The UF model is designed to identify the AI literacies addressed through different academic activities and courses (Dai et al., 2020; Kandlhofer et al., 2016; Long & Magerko, 2020; Ng et al., 2021) so that students can select courses focused on their areas of interest and build their expertise meaningfully. The UF model also provides students with such course specific identified AI literacies that can be identified by employers, and in association with the C3 Center on campus, and thus packaged to showcase student AI skill sets (built across multiple courses and AI competency types) and thus clearly identified 21st century competencies (Buckingham Shum & Deakin Crick, 2016; Cantú-Ortiz et al., 2020; Ng et al., 2021). In the context of higher education and student development, the 21st century has ushered in a series of competencies that educators and institutions are encouraged to foster within their students. These competencies are not just about subject-specific knowledge but are geared toward producing holistic individuals who can navigate a rapidly changing global landscape. While the list of 21st century competencies is long and varies by discussion, some that link to the goals of our AI Across the Curriculum Initiative at UF are: (1) Critical Thinking and Problem Solving: The ability to think critically, analyze situations, and solve problems is invaluable in all fields and facets of life. (2) Collaboration and Teamwork: Working effectively with others, appreciating diverse perspectives, and navigating group dynamics are essential in today's interconnected world. (3) Creativity and Innovation: Encouraging students to think outside the box and come up with new solutions and ideas. (4) Digital Literacy: Beyond just using technology, students should understand the implications, opportunities, and risks in the digital age. (5) Systems Thinking: Understanding how parts of a whole interact with each other and understanding complex systems. (6) Data Literacy: The ability to read, work with, analyze, and argue with data. (7) Ethical Use of Technology: Recognizing the implications of technology on privacy, security, and society. (8) Interdisciplinary Mindset: Appreciating how different fields interconnect and enrich one another. Incorporating these competencies into curricula, co-curricular activities, and experiential learning opportunities can better prepare students for the diverse challenges and opportunities they'll face in the 21st century. Institutions can also support these competencies by fostering a culture of inclusion, innovation, and continuous improvement. Lastly, the course AI category designation process allows review of course offerings to identify gaps or needs to ensure AI learning opportunities are available for all undergraduate students. The five categories of the UF AI Literacy Model are described in Table 2.

Table 2. The UF AI Literacy Model

AI LITERACY CATEGORIES	DESCRIPTION	AI CONTENT*
Know & Understand AI	Know the basic functions of AI and to use AI applications	>50%
Use & Apply AI	Applying AI knowledge, concepts and applications in different scenarios	>50%
AI Ethics	Human-centered considerations (e.g., fairness, accountability, transparency, ethics, safety)	>50%
Evaluate and Create AI	Higher-order thinking skills (e.g., evaluate, appraise, predict, design) with AI applications	>50%
AI Enabled	Support AI through related knowledge and skill development (e.g., programming, statistics) and/or contain a lower total AI content of one of the four Core AI Literacy topics.	10-49%

Note. AI Literacy types are based on the model from Ng et al., 2021. Qualifying AI content percentages may change once more courses are evaluated and managed through this process.

STUDENT LEARNING OUTCOMES

The Task Force and the Assessment Subcommittee identified QEP SLOs for the AI literacy topics proposed. The State of Florida Board of Governors has mandated that all baccalaureate programs in the state public universities develop Academic Learning Compacts (ALCs) for each degree program that include SLOs in three areas: content knowledge, critical thinking, and communication. SLOs were developed to align with the AI Literacies and FL BOG requirements (See BOG Regulation 8.016 in Appendix D). These AI SLOs by literacy are listed below:

Know and Understand AI

- SLO1. Identify, describe, and explain the components, requirements, and/or characteristics of AI. (Content knowledge and communication)
- SLO2. Identify, describe, define and/or explain applications of AI in multiple domains. (Critical thinking and communication)

Use and Apply AI

- SLO3. Select and/or utilize AI tools and techniques appropriate to a specific context and application. (Critical thinking and content knowledge)

AI Ethics

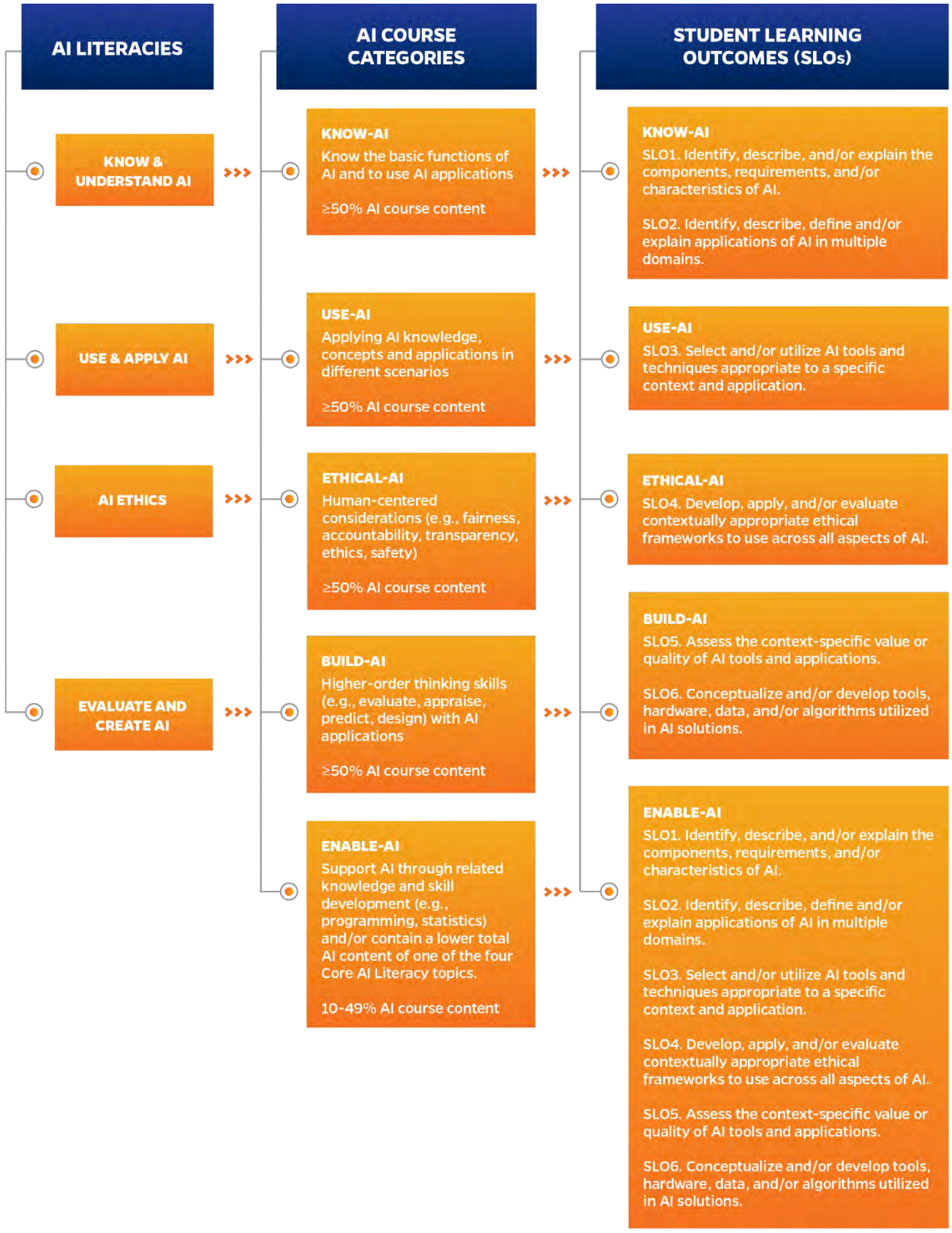
- SLO4. Develop, apply, and/or evaluate contextually appropriate ethical frameworks to use across all aspects of AI. (Critical thinking and content knowledge)

Evaluate and Create AI

- SLO5. Assess the context-specific value or quality of AI tools and applications. (Critical thinking)
- SLO6. Conceptualize and/or develop tools, hardware, data, and/or algorithms utilized in AI solutions. (Critical thinking)

The alignment of SLOs with the AI literacies and categories is summarized in figure 5 and serves as the foundation for the AI Course Category Designation Process.

Figure 5. AI Literacies, Course Categories, and Student Learning Outcomes

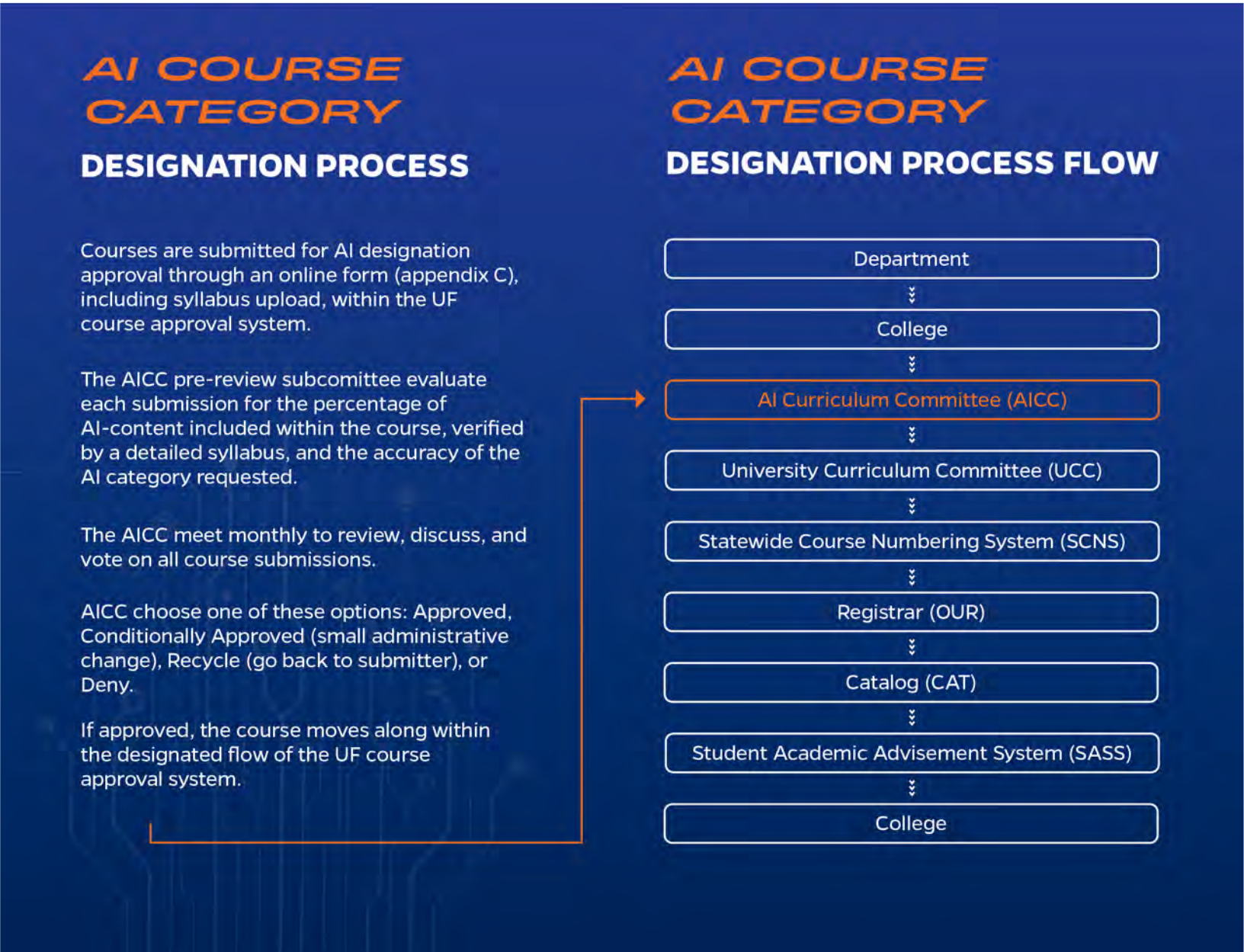


AI COURSE CATEGORY DESIGNATION PROCESS

UF AI category course designation has been approved and will be incorporated into the established UF course approval system; courses will be reviewed by the AI Curriculum Committee (AICC). The AICC is comprised of leading UF AI faculty representing all colleges at UF and supported by the staff of the AI^2 Center.

Through the AI category designation process, AI courses will be reviewed and vetted to assure they meet UF AI course content requirements as well as receiving one of the five AI categories. The AI categories Use-AI, Know-AI, Build-AI, Ethical-AI, and Enable-AI (Figure 5) allow students to consistently identify AI courses across campus and the type/level of AI content to expect in a course. The AI designated courses include assignments that directly address SLOs aligned with the five AI Literacy categories (Table 2). The AI category designation process and AI course approval system flow are summarized in Figure 6.

Figure 6. AI Course Designation Process Summary and Flow



CHAPTER 5
ASSESSMENT

CHAPTER 5:
ASSESSMENT

The University of Florida's Institutional Assessment and Effectiveness System engages all campus academic programs, administrative units, and institution-wide initiatives in ongoing and integrated institution-wide evaluation processes that focus on institutional quality and effectiveness through the systematic evaluation of institutional goals and outcomes to advance the university's mission. The assessment of the QEP goals and SLOs has been intentionally designed to integrate into our existing system in order to generate annual impact evaluation reports that provide substantial data for analysis and review by relevant campus constituencies and to facilitate the use of these data for improvement. In this chapter, we describe in detail how we plan to accomplish this.

DIRECT ASSESSMENT OF STUDENT LEARNING OUTCOMES

Building upon the established processes in UF's institutional assessment and evaluation system and our experience with previous and current institutional initiatives, QEP leadership engaged multiple faculty and staff to develop goals, SLOs, and data collection, analysis, and reporting processes to support its implementation. The QEP leadership designated a sub-committee of Task Force members to develop a process to assess outcomes achievement and goal attainment that integrated seamlessly into our existing system. As the central administrative unit for all artificial intelligence initiatives on campus, the AI^2 Center is responsible for operationalizing, sustaining, and improving the QEP evaluation processes, and modifying goals and outcomes as the initiative progresses. Other campus units that coordinate with the AI^2 center to advance the QEP include the Center for Instructional Technology and Training (CITT), The Center for Online Innovation & Production (COIP), UF Information Technology (IT), and the Office of Institutional Assessment (OIA).

The QEP goals and SLO assessment data collection, analysis, and use of results for improvement takes place in three broad, adaptable steps:

(a) **Set Up and Data Collection** - Instructional designers from UF IT, staff from the CITT and the COIP assist faculty with the preparation of a Canvas *Learning Management Gradebook* to facilitate student achievement data collection. The AI^2 center and the OIA staff assist with the collection of SLO and goal data.

(b) **Data Analysis, Review, and Reporting** – Once the SLO and goal data are collected, UF IT and AI^2 Center staff will download and analyze the data and present it to the AI^2 Center College Leadership Committee for review. The AI College Leadership Committee then compiles SLO achievement and goal attainment data into an effectiveness report that follows UF's established system format and presents its recommendations for improvement. The report then goes to the AI^2 Center Director and Project Manager.

(c) **Annual Impact Report** - The AI^2 Center administrators use the report's information to develop the QEP Annual Impact Report. This report will be disseminated to the college administrators for actions for improvement.

After the college administrators receive and review the annual impact report, they will meet with their AI faculty to address recommendations from the report to modify/improve student learning achievement and goal attainment as appropriate.

RUBRIC DESIGN AND IMPLEMENTATION

Due to the multifaceted nature and variability of AI applications within various disciplines across the university, the assessment sub-committee members agreed to develop a four-scale, holistic rubric for each SLO. In this rubric, each SLO is measured using four broadly described achievement levels. This allows faculty sufficient autonomy in rating, accommodates the variety of applications and discipline-specific skills in UF's over 200 unique programs, and provides actionable data for institutional review and use for improvement.

The six rubrics in Table 3 define the performance indicators established for each SLO. Each rubric is based on a four-point scale where three (3) is the Target. A score of four (4) shows performance that exceeds the Target, and scores of two (2) or one (1) are below the Target.

Table 3. The Six SLO Rubrics

SLO	4	3 (TARGET)	2	1
SLO1. Identify, describe, and/or explain the components, requirements, and/or characteristics of AI.	The student identifies, describes and/or explains all of the components, requirements, and/or characteristics of AI.	The student identifies, describes and/or explains most of the components, requirements, and/or characteristics of AI.	The student identifies, describes and/or explains a few of the components, requirements, and/or characteristics of AI but does not identify, describe and/or explain many.	The student does not identify, describe and/or explain any of the components, requirements, and characteristics of AI.
SLO2. Identify, describe, define and/or explain applications of AI in multiple domains.	The student identifies, describes, defines and/or explains all of the applications of AI in multiple domains.	The student identifies, describes, defines and/or explains most of the applications of AI in multiple domains.	The student identifies, describes, defines and/or explains few of the applications of AI in multiple domains but does not identify, describe and/or explain many.	The student does not, identify, describe, define and/or explain any of the applications of AI in multiple domains.
SLO3. Select and/or utilize AI tools and techniques appropriate to a specific context and application.	The student selects and/or utilizes all of the AI tools and techniques appropriate to a specific context and application.	The student selects and/or utilizes most of the AI tools and techniques appropriate to a specific context and application.	The student selects and/or utilizes few of the AI tools and techniques appropriate to a specific context and application but does not select and/or utilize many.	The student does not select and/or utilize any of the AI tools and techniques appropriate to a specific context and application.
SLO4. Develop, apply, and/or evaluate contextually appropriate ethical frameworks to use across all aspects of AI.	The student develops, applies, and/or evaluates all of the contextually appropriate ethical frameworks to use within AI.	The student develops, applies, and/or evaluates most of the contextually appropriate ethical frameworks to use within AI.	The student develops, applies, and/or evaluates a few of the contextually appropriate ethical frameworks to use within AI.	The student does not develop, apply, and/or evaluate any of the contextually appropriate ethical frameworks to use within AI.
SLO5. Assess the context-specific value or quality of AI tools and applications.	The student assesses all of the context-specific value or quality of AI tools and applications.	The student assesses most of the context-specific value or quality of AI tools and applications.	The student assesses a few of the context-specific value or quality of AI tools and applications.	The student does not assess any of the context-specific value or quality of AI tools and applications.
SLO6. Conceptualize and/or develop tools, hardware, data, and/or algorithms utilized in AI solutions.	The student conceptualizes and/or develops all tools, hardware, data, and/or algorithms utilized in AI solutions.	The student conceptualizes and/or develops most of the tools, hardware, data, and/or algorithms utilized in AI solutions.	The student conceptualizes and/or develops a few of the tools, hardware, data, and/or algorithms utilized in AI solutions.	The student does not conceptualize or develop any of the tools, hardware, data, and/or algorithms utilized in AI solutions.

MITIGATING ERROR VARIANCE

As we accommodate the complexities of this process and seek to mitigate potential sources of error, we aim to work with faculty to address the limitations of this model and to establish data collection and analysis processes that center on the specific rubric constructs (SLOs), rather than on various assessment methods. Although the QEP assessment subcommittee members who developed this instrument agreed there is enough distinction among the levels of achievement, we acknowledge the following sources of error variance that arise from the use of a single measurement instrument:

a. Different assessment methods
b. Multiple instructors
c. Various content areas
d. Distinct delivery mode or campus location

To support faculty to develop a common understanding of the levels of performance in each AI SLO rubric, and to mitigate sources of error variance, we plan to conduct a three-phase pilot in the Fall 24/Spring 25 semesters to gather baseline data using the first batch of AI designated courses approved by the AICC. As a result of the first phase of the pilot, we hope to produce some examples that will serve to illustrate what is expected for each performance level in the rubric (Phase 1). In Phase 2 of the pilot, we aim to employ the rubric and use the produced artifacts as examples of each level to initiate a "training" with the faculty members who will score the rubric. At this point, we should have more courses to be included. Therefore, more artifacts will be produced that will be part of a possible rubric calibration exercise to be determined (Phase 3 – Spring 2025). The three-phase pilot results should inform the QEP 2024-25 annual report (First Year Report), which will mostly include the QEP submitted in 2024, adjustments made after the 2024 reaffirmation visit, rationale for changes, baseline data, and reflections.

PROCEDURES FOR DIRECT ASSESSMENT OF SLOS

The QEP Director and AI2 Center staff are responsible for the QEP assessment administration. The OIA and OIPR will provide support.

1. Random selection of a sample of 20% of the students in each section of courses with AI designation. The 20% sample provides sufficient assessment information for inference, maintains confidentiality, and minimizes scoring time for faculty.
2. Train instructional designers on the assessment system and arrange for instructional designers to work with faculty to understand the assessment system and faculty responsibilities.
3. Develop Learning Management System (LMS) in Canvas for data collection.
4. Develop QEP AI Assessment Guide for faculty (Appendix E).
5. Data management, analysis, coordination of review retreats, and dissemination of annual impact report among colleges.

Faculty are responsible for the following:

1. Identify course assignment(s) to measure AI SLOs.
2. Review the QEP AI Assessment Guide and rubrics.
3. Work with instructional designers to associate AI SLO rubrics with course assignments (CITT and COIP).
4. Score the 20% sample selected for the course using the AI SLO rubrics as part of their regular grading in their course.
5. Continuously improve the process by making changes based on results when appropriate.
6. Provide feedback on the process so that it can be modified and improved.

The QEP assessment cycle will be implemented fully by the third year. The preliminary timeframe for implementation is shown in Table 5.

Table 5. QEP Assessment Implementation Timeline

YEAR	ACTIONS
1st Year 2024-2025	› Implementation of assessment system across AI courses › Pilot rubrics and scoring procedure in all AI courses after receiving AI course designation. Randomized 20% of course students are graded in each course. The number of courses and students surveyed will increase each year as courses continue to receive AI Course designation. › Data collection › Data analysis and dissemination › Annual Impact Report in Campus Labs (Results from Fall 2024-Spring 2025 are reported in Fall 2025)
2nd Year 2025-2026	› Data from pilot informs adjustments prior to year 2 › Implement scoring procedure in all UF AI courses as a required final step in receiving AI course designation. Randomized 20% of course students are graded in each course. › Data collection › Data analysis and dissemination › Annual Impact Report in Campus Labs (Results from Fall 2025-Spring 2026 are reported in Fall 2026)
3rd Year 2026-2027 **4th Year 2027-2028**	› Data analysis - from years 1 and 2 courses informs years 3 and 4 › Implement scoring procedure in **all AI courses** in years 3-4 (20% sample students are graded in each course) › Data collection › Data analysis and dissemination › Annual Impact Report in Campus Labs (Results from Fall 2026-Spring 2027 reported in Fall 2027) › Annual Impact Report in Campus Labs (Results from Fall 2027-Spring 2028 reported in Fall 2028)
5th Year 2028-2029	› Implement scoring procedure in all AI courses (Fall and Spring) (20% sample students are graded in each course) › Data analysis for all courses › Fifth Year Impact Report (Synthesizes Annual Impact Reports from 2024-2028)

ANNUAL ASSESSMENT AND EVALUATION CYCLE

The QEP assessment annual data review cycle will be incorporated into UF's institutional assessment and effectiveness reporting cycle. The academic program assessment cycle starts in the fall of each year when academic programs within each college report their previous year assessment data to the OIA via Campus Labs. The QEP Director and AI^2 Center staff will report to the OIA via Campus Labs on the progress of the QEP each year within the same existing cycle. Figure 7 presents a graphic representation of this cycle and subsequent description of each stage, including the respective roles and responsibilities.

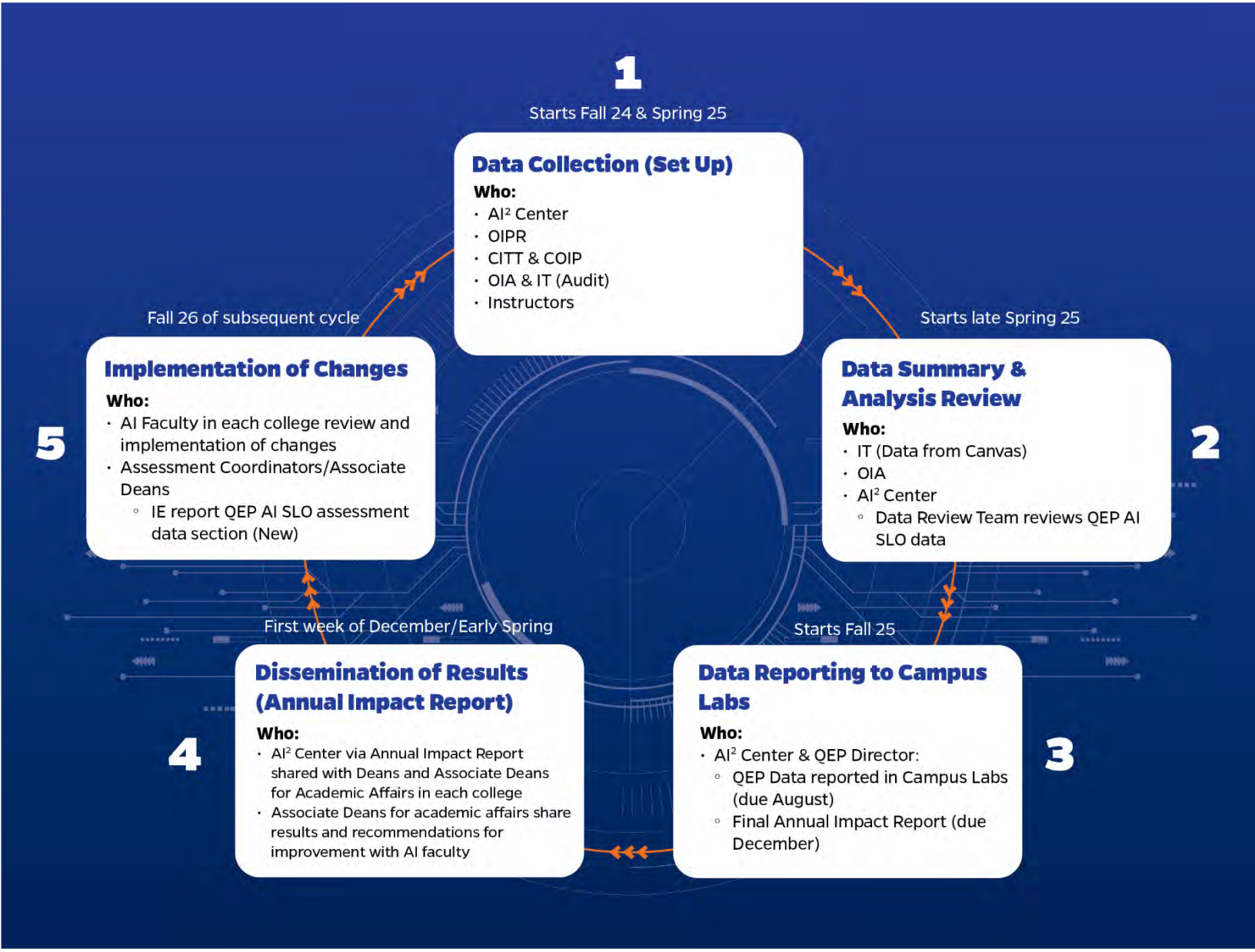


Figure 7. QEP Annual Assessment Cycle

The next section describes the cycle in detail.

1. **Data Collection (Fall & Spring)** – Each year—Fall and Spring Terms
    a. **AI² Center** provides a list of AI Designated Courses including the following information:
        i. Course name and section number
        ii. Instructor name and e-mail address
        iii. Delivery mode and/or location (i.e., Online or Residential; On-Campus or Off-Campus)
    b. **OIPR** receives this list and determine a random sample of 20% students for each section. This should be completed after drop/add period each fall and spring. This sample file is shared with the OIA and the AI² Center.
    c. **CITT** and **COIP** participate in AI SLO Assessment Orientation for Faculty. AI faculty who teach courses (already designated as AI or AI Enabled courses – See Chapter 4) go through the AI SLO Orientation to become familiar with the QEP SLO assessment process. In this orientation, faculty will:
        i. Learn about the QEP AI SLOs assessment process.
        ii. Be introduced to the QEP AI SLOs Rubrics.

iii. Be informed about their roles and responsibilities in properly assessing and continuously evaluating the effectiveness of assessment methods (assignments) associated with QEP AI SLOs.
iv. Receive preliminary guidance from CITT and COIP on how to connect one (or more) existing assessment methods (assignments) with the QEP AI SLOs rubrics.

d. AI^2 Center sends the 20% sample list to each instructor of AI courses.
e. **OIA** collaborates with **IT** in monitoring full implementation of rubrics in AI courses (IT Audit). The OIA staff send one e-mail to all instructors of courses that are pending this step and encourage instructors to contact CITT and COIP instructional designers for assistance in associating course assignments with QEP AI SLOs.
f. **Instructors** score the QEP AI SLO rubrics using Speed Grader in Canvas*
**This step is crucial for the proper record of data in Canvas.*

2. Data Summary and Analysis (Late Spring)

a. At the end of each Spring, **IT** creates a summary data report with the preliminary analysis of the QEP AI SLO assessment data collected via Canvas.
b. This report is sent to the **OIA** and to the **AI^2 Center**.
c. **AI^2 Center** completes the following (Collaboration with **OIA**):
i. Work with the OIA to form an AI College Leadership Committee. This team's main duty is to review the QEP AI SLO assessment data and make recommendations for improvement based on results from the latest cycle. Members of this team should include Associate Deans for Academic Affairs and/or AI leadership in each college
ii. Offer annual Data Review Retreat or similar event late Spring or early Summer.
iii. AI College Leadership Committee review QEP AI SLO data and make recommendations for improvement based on results.

3. Data Review & Reporting to Campus Labs (Fall)

a. Each fall (August), the **AI^2 Center** and the **QEP Director** report on QEP Goals and SLO assessment results in Campus Labs. After review from the OIA, a version of this report, prepared by the **QEP Director,** will serve as the Annual Impact Report (due first week of December).

4. Dissemination of Results (First week of December/Early Spring)

a. The AI2 Center will share the Annual Impact Report with Deans and Associate Deans for Academic Affairs in each college, as well as the AI College Leadership Committee (First week of December). Feedback on the results and process are expected.
b. AI2 Center will offer a retreat for faculty teaching AI courses, early Spring 2025. This retreat will be attended by the AI2 Center, the AI College Leadership Committee, OIA, and AI faculty. The goal is to provide an opportunity for faculty to discuss additional aspects that are pertinent to goals, SLOs, and the assessment of the QEP. A preliminary structure for the retreat includes three parts:
i. Part 1. Overall discussion of AI course alignment with SLOs (i.e., AI designation and AI SLO assessment processes). Guiding questions: Do the AI SLOs assessed in your course accurately reflect the curriculum? If not, what should be changed?
ii. Part 2: Technical aspects of Canvas and detailed demonstration of AI SLOs associated with existing assessments in Canvas. Guiding Question: Are the AI SLOs assessed in your course properly associated with your assessment in Canvas?
iii. Part 3: Practical activity involving analysis and discussion of aggregated data. Guiding questions: Based on the aggregated data, what action or change would you recommend for the improvement of the QEP as we move forward? These changes may include changes in the curriculum at the course level, changes in instruction, and/or changes in assessment methods.
c. Results of the first retreat should generate preliminary insight on subsequent actions. Focus groups, surveys, or other approaches will continue to be employed in year 2 (2025-2026) to support improvements in teaching and learning.

5. **Implementation of Changes (Fall of subsequent cycle)**
    a. **AI Faculty** in each college review courses to incorporate changes associated with the impact report recommendations when/if applicable (review during the Spring, implementation of changes in Fall).
    b. **Assessment Coordinators/Associate Deans** - IE report QEP AI SLO assessment data section (*New*) – IE Report for each college includes a new section associated with AI SLOs assessment in each college (Fall). In this section of the IE report, assessment coordinators will report on the following:
        i. *How many courses in your college are AI Designated or AI Enabled?* (Numerical field)
        ii. *AI SLO Assessment Map* – Each college will provide a list of existing AI courses that have been through the AI designation process via approval system and were "officially" designated as AI courses through a rigorous review conducted by the AICC. A Template for the Assessment Map will be provided (OIA Website page "Resources & Information"). See example below:

AI Course/AI SLOs	AI SLO 1	AI SLO 2	AI SLO 3	AI SLO 4	AI SLO 5	AI SLO 6
XXX3000	X	X				
XXX4000			X			
XXX3300				X		
XXX4400					X	X

        iii. *QEP Annual Impact Report Recommendations* – Please provide the overall recommendations included in the QEP Annual Impact Report that were implemented across all or some courses in your college. Please provide one or more examples.

ANNUAL REPORTS

The AI^2 Center will report the QEP data annually via Campus Labs. The OIA will work closely with the AI^2 Center to prepare the annual impact reports (Table 6) that will serve to monitor progress and ensure the continuous improvement of the QEP. These reports will be shared with each college for recommendations for improvement (to be implemented in subsequent Fall).

Table 6. Annual Impact Reports per Year

YEAR	REPORTS AND DEADLINES
2024-25	Year 1 Annual Report (Due first week of December 2025)
2025-26	Year 2 Annual Report (Due first week of December 2026)
2026-27	Year 3 Annual Report (Due first week of December 2027)
2027-28	Year 4 Annual Report (Due first week of December 2028)
2028-29	Year 5 – Fifth-Year Report (Due prior to Fifth-Year Review)

Data will be reported annually in Campus Labs starting fall 2025. Campus Labs reports will serve as a repository of data for the QEP Annual Impact Reports. QEP Annual Impact reports are shared with college Deans with recommendations for improvement. AI^2 Center will disseminate the QEP Annual Impact Reports.

The QEP Annual Impact Reports will be crucial in ensuring the proper advancement of the QEP stages and in determining actions for improvement. The structure of the annual impact reports and the reporting process is similar to the institutional academic assessment data review. The AI^2 Center staff and the QEP Director will be responsible for reporting the annual progress in Campus Labs. The OIA will collaborate with the QEP Director to complete the QEP Annual Impact Report each year. The report will consistently include the following elements:

1. Mission Statement – How the QEP aligns with the institutional mission
2. Goals – QEP Goals
3. Evaluation methods – How goals are measured
4. Results – Are goals being met?
5. Student Learning Outcomes – What students are expected to know and do
6. Assessment Methods – How are students being assessed?
7. Results – Are SLOs being met? Are assessment methods effective?
8. AI SLO Assessment Map – Distribution of SLO assessments methods across courses (Same used as a template by colleges in the IE Report)
9. Methods and Procedures – Description of assessment methods and procedures
10. Impact and Use of Results for Improvement – Impact from results and necessary changes for improvement (from AI College Leadership Committee recommendations during the Annual Data Review Retreat)

INDIRECT ASSESSMENT

An indirect assessment tool (survey) was developed by the QEP Assessment subcommittee to measure the following: (1) engagement with UF AI initiatives, (2) perceptions on AI course content, programs and research, and (3) perceptions of how students effectively meet SLOs. The three-part survey presents 25 questions (Appendix F) and is organized as follows:

- **Part 1-Engagement with UF AI Initiatives.**
  - Data results from this part of the survey will be utilized to inform actions for improvement in the following areas:
    - Engagement with AI
    - AI Career related activities
    - AI course content
- **Part 2-AI Courses, programs, and research**
  - Results from this part of the survey should generate baseline data associated with the AI QEP Goals. Data from the first administration should inform specific targets to be included in each goal. This part of the survey is centered on student access to information about AI courses, programs, and research activities.
- **Part 3-Student Learning Outcomes**
  - Results from this part of the survey will serve to inform students' perceptions of their own learning as they complete AI courses and in alignment with the four AI Literacies and respective learning outcomes. Data generated from students' responses will be analyzed in conjunction with direct assessment data to inform actions and/or changes that should promote more effective support of students' learning. The main areas of focus in this part are:
    - Basic functions and use of AI applications
    - Use and application of AI in specific contexts
    - Ethics and AI
    - Evaluating and creating AI

The initial instrument was developed to be disseminated among students who complete the courses receiving AI designation. The main purpose of this instrument is to provide data on the indirect assessment of the QEP Goals, AI initiatives, and QEP SLOs. The question structure and scales were adapted from the SERU survey last administered in 2017. Assessment criteria items were developed to reflect the QEP Logic Model (Figure 8), QEP Goals, and QEP SLOs.

The indirect assessment tool was piloted in Spring 2024. The survey was emailed to all students enrolled in the Artificial Intelligence Fundamentals course on April 23rd, 2024. This course is available to all undergraduate students and is the first required course in the UF Undergraduate AI Certificate in AI Fundamentals and Applications program.

Data from the pilot will be used to adjust the tool and prepare for full implementation in the Fall 2024. All

students completing courses that received AI designation will complete this indirect assessment starting 2024-2025. The AI2 Center will administer the survey each Fall and Spring terms.

ASSESSMENT OF QEP GOALS AND OUTPUTS

The QEP goals and outputs focus on the curricular activities (e.g., courses and academic programs) as well as other AI learning opportunities such as AI research and internships. Professional development and workforce preparedness are beyond the scope of the QEP but will be part of the AI^2 Center. QEP Goals will be reported by the AI^2 Center and QEP Director each year via Campus Labs as part of the institutional effectiveness (IE) annual cycle. The IE report will serve as the foundation for the QEP Annual Impact Report.

The first goal and associated outputs are based on establishing an AI curriculum that allows all students the opportunity to take AI courses based in each of the five AI categories. These five course categories are: (a) *know and understand AI*, (b) *use and apply AI*, (c) *AI ethics*, (d) *evaluate and create AI*, (e) and *enabling AI*. Goal 1 establishes the AI courses available to all students. The outputs are the number of courses available and student completion of the AI courses.

Goal 1: Develop AI courses in all five AI categories that are accessible to all undergraduate students in all colleges.

Some AI courses are already accessible to students in some colleges. The QEP will facilitate new course development for courses of general interest (university-wide) as well as those that are specific to a given college. The assessment of Goal 1 will monitor changes in the AI curriculum and the impact on students' completion of courses. The assessment of Goal 1 will be conducted annually to include the following:

a. A count of the curricular offerings for each college by AI category and aggregated for UF.
b. A count of undergraduate students' successful completion of AI courses for each AI category by college and aggregated for UF.
c. The number of AI courses (all categories) completed by graduating students will also be monitored by college and aggregated for UF.

In addition to the accessibility of courses to all students, AI academic programs and other pathways (e.g., majors, co-majors, minors, certificates, and concentrations) will be accessible to undergraduate students in all colleges. Certificates, majors, minors, and concentrations would be approved in the standard ways with a focus on AI. The goal for AI academic programs (goal 2) will be parallel to the AI curriculum goal 1.

Goal 2: Develop AI academic programs that are accessible to all undergraduate students.

The assessment of Goal 2 will be conducted annually to include counts of the programs and the students completing the programs. The assessment includes the following:

a. AI academic programs within each college such as majors, minors, and certificates. (Note: AI academic programs may be accessible to students across colleges and some options already are available across all colleges).
b. A count of undergraduate students' successful completion of AI academic programs by college and for UF.

Goal 3: Develop the AI scholar program and the AI Medallion Scholars program for undergraduate students.

The assessment of Goal 3 will be:

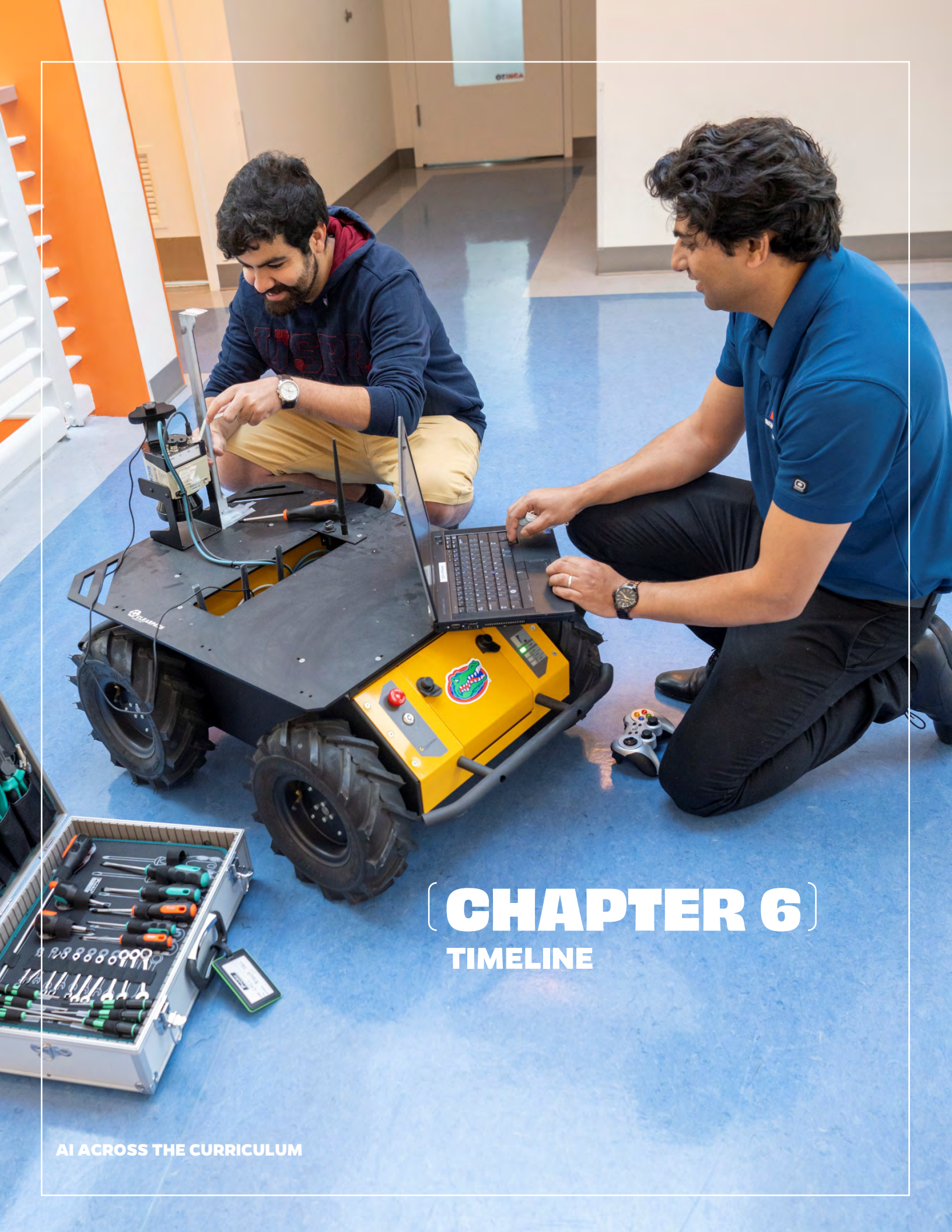
d. A count of the number of undergraduate students successfully completing the AI scholar program by college for graduating students.
e. A count of the number of undergraduate students receiving the AI Medallion Scholar upon graduation by college.

The AI Undergraduate Scholar program will include traditional undergraduate research conducted with an AI faculty researcher (and affiliates of the AI^2 Center) as well as Course-based Undergraduate Research Experience

(CURE) courses within the framework established by the UF Center for Undergraduate Research. Opportunities will not only be available for AI research-oriented courses but also cross-college team-based courses designed to work with an AI industry partner and a real-world industry-based challenge, I-CURE. AI Undergraduate Medallion Scholars will be undergraduate students who must complete four of the following items:

- AI Scholar
- AI CURE
- AI I-CURE
- Present at a university AI^2 event (3MT, Poster, or Oral Presentation)
- Attend two AI^2 center events
- Complete an AI-based internship
- Complete nine credits of AI coursework with any of the AI literacies

We expect the first year's QEP Annual Report (Due first week of Dec. 2025) will provide us with baseline data that will be helpful in determining more specific targets for each goal in subsequent years (Years 2-5). Data from AI^2 Center regarding AI course numbers approved by the AICC, the number of AI programs offered in each college, and the AI Medallions awarded to students who completed requirements (Table 7), in addition to results from the indirect assessment instrument (Appendix F) will serve as the foundation for the analysis of the progress on QEP goals and outputs.



CHAPTER 6

TIMELINE

CHAPTER 6:
TIMELINE

The UF QEP timeline begins prior to Fall 2024 and continues through Summer 2029. The timeline for the full implementation of the QEP activities is presented by academic year on the following pages (Tables 7 and 8).

Table 7: Activities prior to Fall 2024

ACTIVITY NAME	ACTIVITY DESCRIPTION	DATE
AI^2 Center Personnel and Support Staff	In preparation for the QEP/UF AI initiatives, AI^2 Center Director hire and onboard team members. Once core team is onboard, determine need for student assistance and other OPS part-time support.	8/2022-1/2023
Website development to highlight all QEP AI programs and initiatives.	AI^2 Center Communications and Marketing Director develop the ai.ufl.edu website to feature AI programs, events, initiatives, resources, and student engagement and experiential opportunities.	1/2023 – 1/2024
AI^2 Center – develop criteria process for faculty affiliation	AI^2 Center Project Manager work with team and taskforce co-chairs to define AI^2 Center Faculty Affiliate criteria and application/approval process.	4/2023
Review and designation of AI undergraduate courses with AI literacy topics covered	AI^2 Center Project Manager work with AI Curriculum Committee and the Associate Provost for Undergraduate Affairs to integrate the AICC into the UF course approval process.	1/2023-1/2024
Identification of existing certificates and programs	AI^2 Center Communications and Marketing Director baseline analysis and cataloging, list on website	5/2023
Determine how to track courses and certificate/academic program enrolments campuswide	AI^2 Center Director and Project Manager work with Registrar, Undergraduate Affairs, and UFIT teams to identify and track identified data.	1/2023 – 1/2024
Develop canvas pilot program for data collection and extraction of SLO assessment in courses	Director of Institutional Assessment and AI^2 Center Project Manager work with CITT to develop SLO data collection process.	1/2023 – 1/2024

Launch of AI undergraduate scholars	AI^2 Center Director and Project Manager work with the Center for Undergraduate Research to develop and pilot 1st year of the AI Scholars program.	11/2022 – 5/2024
Development of marketing and communication materials / promotion	AI^2 Center Communications and Marketing Director create and disseminate collateral to inform UF students, staff, faculty, and stakeholders of QEP/UP AI programs and initiatives.	11/2022 – 5/2024
Creating the AICC	AI^2 Center Director and Project Manager invite AI Curriculum Work Group members to join inaugural AICC and name a AICC Chair to lead.	8/2023
Develop criteria for and program for CURE courses	AI^2 Center Director and Project Manager work with QEP Taskforce Chairs and Center for Undergraduate Research team to develop criteria and program for AI CURE courses.	5/2023-5/2024
Develop criteria for and program for ICURE courses	Continuation of above CURE course efforts with select UF AI faculty already working with industry partners to develop best practices, infrastructure, criteria, and program of AI ICURE courses.	8/2023-8/2024
Develop medallion program	AI^2 Center Project Manager develop criteria, procedure, and monitoring for the medallion program.	1/2024-7/2024

Table 8. Assessment activities and related QEP activities occurring annually once QEP begins: 2024 Fall

YEAR	2024-25			2025-26			2026-27			2027-28			2028-29		
TERM	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su	F	Sp	Su
Indirect assessment	x	x		x	x		x	x		x	x		x	x	
Direct assessment	x	x		x	x		x	x		x	x		x	x	
AI^2 Center reports to the OIA as part of the existing IE reporting process*				x			x			x			x		
IE Review/Feedback			x			x			x			x			x
Annual Impact Reports	x			x			x			x			x		
Data Review Retreats		x			x			x			x			x	
Actions for improvement are implemented				x			x			x			x		

*First Year Annual Report – Fall 2025 (See Table 6)

CHAPTER 7
ORGANIZATIONAL STRUCTURE

CHAPTER 7:
ORGANIZATIONAL STRUCTURE

Figure 3 shows the AI^2 Center organizational chart. The Director of Institutional Assessment, the university's SACSCOC Liaison, and the Director of the AI^2 Center will be responsible for reporting the implementation and results of the QEP to the Provost and Senior Vice President for Academic Affairs.

The Leadership Team holds decision-making authority regarding all matters related to funding and implementation of the QEP. The Leadership Team consists of the AI^2 Center Director, the Project Manager who is responsible for the operational management of the QEP, the Director of Institutional Assessment, and representatives from the Office of Student Affairs.

The AI^2 Center Director leads QEP Implementation and will work with a full-time Project Manager who manages the daily operations of the QEP. The Project Manager will be supported by the resources of the Office of Institutional Assessment (OIA). The major responsibilities of the Project Manager are:

- Design university-wide projects and programs related to the QEP.
- Track university-wide projects and programs related to the QEP.
- Monitor and report metrics outlined in the QEP to relevant parties including information needed for accreditation.
- Provide updates to the AI^2 Center Director on QEP modifications and progress.
- Coordinate with others across campus on QEP programs, including UF Strategic Communications and Marketing, UF Career Connections Center, the Center for Teaching Excellence, and more.
- Coordinate with UF VP on data collection needs for QEP.

BUDGET

A summary of the QEP budget provided by UF shows the financial backing of this plan, with a total of $800,000. This is an annual budget allocated for 5 years.

AI² CENTER ANNUAL ALLOCATED BUDGET

FY 2025 BUDGET	AI² CENTER QEP 5-YEAR REOCCURRING ANNUAL BUDGET	$800,000
Budget line item	**Notes**	**Allocation**
STAFF:		
AI² Center Personnel	See Figure 3 organizational chart, center director salary not included, covered by Office of the Provost	$412,000
Part-time Student Assistant(s)	One part-time student admin assistant and one part-time marketing/social media student assistant, one graphic design assistant (8k + 8k + 20k)	$36,000
Faculty Fellows	Expert AI faculty member(s) salary stipend working on QEP projects	$20,000
C3 Student Engagement Budget	Professional development training for C3-embedded team member	$10,000
EVENTS:		
Sponsorships	AI² Center event sponsorship funds available for four college/faculty run AI events across campus, can include speaker series (4x$2,500)	$10,000
AI Days	Signature annual AI event to educate the UF community about all things AI at UF. Five-day event of UF AI: one day of student competitions, two days of faculty speakers, trainings, and panels with topics ranging from all programs across UF, one day of work force readiness led by C3, one day of college-hosted events across campus	$50,000
AI Ethics Symposium	Annual Spring AI Ethics symposium hosted by the AI² Center and led by the AI Ethics Workgroup covering a range of topics and disciplines through panel discussion. Open to all UF community to promote ethically focused education in AI	$5,000
PROGRAMS:		
AI Scholars	Fund 25 undergraduate students participating in AI-related research with a UF faculty member are invited to apply for the AI Scholars Program through the Center for Undergraduate Research. (25x$2,250)	$56,250
Quest 1 and 2 Courses	Incentivize the development and teaching of six new AI Quest 1 & 2 courses - early undergraduate courses (6x$3,000)	$18,000
Quest 3 Courses	Incentivize the development and teaching of six new AI Quest 3 courses - experiential undergraduate courses (6x$3,000)	$18,000

Undergrad AI Certificate Courses	Incentivize the development and teaching of six new AI courses from diverse disciplines to increase the courses available within the Undergraduate AI Certificate in AI Fundamentals and Applications - available to all undergraduates (6x$3,000)	$18,000
AI CURE and AI I-Courses	Incentivize the development, teaching, participation in a faculty learning community, and participation in training the next year's cohort of AI CURE faculty.	$20,000
AI Medallion Program	Medallion program and ordering of medallions	$5,000
Developing AI modules	Incentivizing development of AI modules and infostructure of AI module repository	$15,000
Publishing on AI Pedagogy	Incentivizing publishing of AI pedagogy (2,500 each)	$20,000
Faculty Professional Development	Fall and Spring AI module trainings for non-AI faculty to embed AI education within existing courses - trainers and facility (2x$2,500)	$5,000
OPERATIONAL:		
General operating expenses	AI^2 Center general operating expenses	$30,000
Marketing	AI programs and events marketing materials/expenses	$25,000
Travel	QEP team - SAC COC trainings/conferences and other conference/training expenses	$10,000

GRAND TOTAL	**$783,250**
Carryover	$11,750

In the summer of 2025, the AI^2 Center Director and Project Manager will review the fiscal year (FY) 2025 budget and expenditures, make revisions based on their evaluation, and subsequently update the budget for FY2026. This assessment and budget refinement process will be repeated for FY2027 and FY2028.

During the summer of 2029, the AI^2 Center Director and Project Manager will collaborate with members of an updated QEP taskforce to formulate the FY2029 budget for the final year of QEP implementation. This final year budget will make use of the annual budget allocation for the QEP/AI^2 Center, including any carryover funds, to bolster the ongoing initiatives aimed at institutionalizing and integrating AI throughout the curriculum within the UF's established processes and programs.

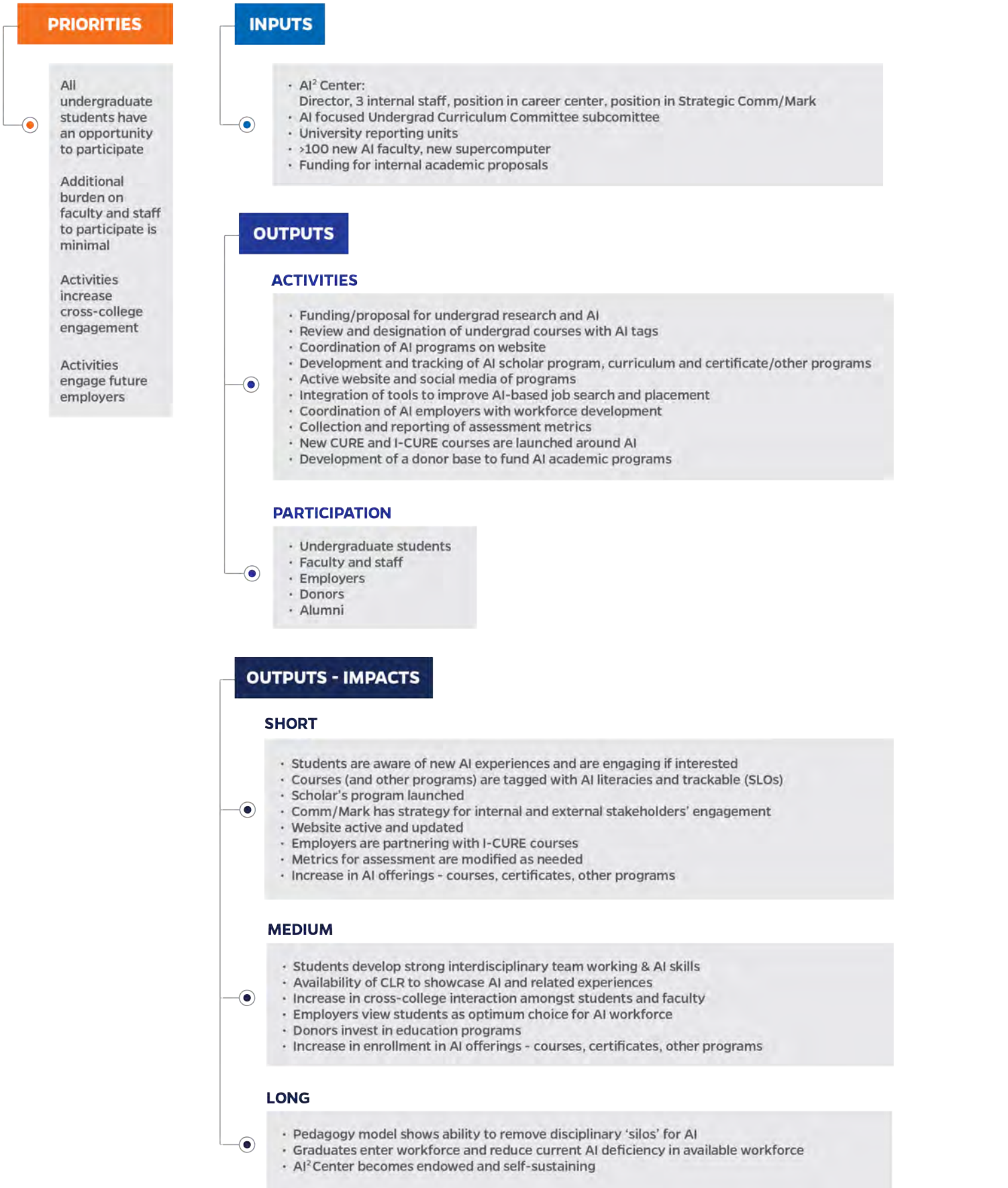
SUMMARY

The University of Florida (UF) constituents identified *Artificial Intelligence (AI) Across the Curriculum* as the topic for its five-year Quality Enhancement Plan (QEP). The QEP topic selection effort was conducted through strategic and integrated work of faculty, staff, students, and administrators to maximize the institution-wide impact of significant donor support and NVIDIA's gift of higher education's supercomputer, called HiPerGator. The topic directly relates to the institution's strategic planning, as it aligns with the university's mission to enable our students "to lead and influence the next generation" and addresses the need for an AI-literate workforce. Thus, the QEP offers a terrific opportunity to create an organizational structure and intentional processes to foster AI in the curriculum and other complementary academic programs.

A QEP Task Force of diverse individuals across campus was appointed in November 2021. The task force was charged by the former Director of Institutional Assessment to develop a five-year plan (2024-2029) that would offer all undergraduate students at UF the opportunity to acquire knowledge, skills, and applications in AI. *AI Across the Curriculum* is focused on providing students with the resources and skills to become successful digital citizens and global collaborators. A sub-committee, composed of members of the task force, developed the assessment plan for the QEP.

The QEP assessment plan includes student learning outcomes that are specific, measurable, and support student learning in the four AI literacy topics: 1) know and understand AI, 2) use and apply AI, 3) evaluate and create AI, and 4) AI ethics (as fully described in Chapter 5). The assessment of the QEP relies on direct and indirect assessment of the student learning outcomes associated with the QEP/AI courses, and the assessment of the goals of the program. The institution's commitment to ensuring the successful implementation of the QEP is demonstrated through the formation of the Artificial Intelligence Academic Initiatives Center (AI^2 Center), established in 2022 by former Provost, Dr. Joseph Glover. The AI^2 Center fulfills an essential initiative proposed by the QEP Task Force and offers an organizational structure for the QEP and other AI initiatives. Since its initial conceptualization, the QEP *AI Across the Curriculum* has been creating valuable campus-wide opportunities for exploring AI, considering AI awareness and general knowledge, discovering AI application and use in different disciplines, and supporting AI foundational development and expertise.

Figure 8. QEP Logic Model



REFERENCES

Ahmad, T., (2019). Scenario based approach to re-imagining the future of higher education which prepares students for the future of work. Higher Education, Skills and Work-Based Learning, 10(1), 217-238.

Allam, Z. & Dhunny, Z.A. (2019). On big data, artificial intelligence and smart cities. Cities 89, 80-91. https://doi.org/10.1016/j.cities.2019.01.032

Borenstein, J., & Howard, A. (2021). Emerging challenges in AI and the need for AI ethics education. AI Ethics 1, 61–65. https://doi.org/10.1007/s43681-020-00002-7

Buckingham Shum, S., & Deakin Crick, R. (2016). Learning Analytics for 21st Century Competencies. Journal of Learning Analytics, 3(2), 6-21. https://doi.org/10.18608/jla.2016.32.2

Cantú-Ortiz, F. J., Galeano Sánchez, N., Garrido, L. Terashima-Marin, H., & Brena, R. F. (2020). An artificial intelligence educational strategy for the digital transformation. International Journal on Interactive Design and Manufacturing 14, 1195–1209. https://doi.org/10.1007/s12008-020-00702-8

Chen, X., Xie, H., & Hwang, G.-J. (2020). A multi-perspective study on artificial intelligence in education: Grants, conferences, journals, software tools, institutions, and researchers. Computers & Education: Artificial Intelligence, 1. https://doi.org/10.1016/j.caeai.2020.100005. Article 100005

Chiu, T. K. F., & Chai, C. (2020). Sustainable Curriculum Planning for Artificial Intelligence Education: A Self-Determination Theory Perspective. Sustainability, 12, 5568. https://doi.org/10.3390/su12145568

Dai, Y., Chai, C. S., Lin, P. Y., Jong, M. S. Y., Guo, Y., & Qin, J. (2020). Promoting Students' Well-Being by Developing Their Readiness for the Artificial Intelligence Age. Sustainability, 12(16) 6597. https://doi.org/10.3390/su12166597

Hu, Y., Li, W., Wright, D., Aydin, O., Wilson, D., Maher, O, and Raad, M. (2019). *Artificial Intelligence Approaches. The Geographic Information Science & Technology Body of Knowledge* (3rd Quarter 2019 Edition), John P. Wilson (ed.). DOI: https://doi.org/10.22224/gistbok/2019.3.4

Hwang, G.-J., & Chien, S.-Y. (2022). Definition, roles, and potential research issues of the metaverse in education: An artificial intelligence perspective. Computers & Education: Artificial Intelligence, 3. https://doi.org/10.1016/j.caeai.2022.100082

Hwang, G. J., Xie, H., Wah, B. W., & Ga˘sevi´c, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. Computers & Education: Artificial Intelligence, 1. https://doi.org/10.1016/j.caeai.2020.100001

Kandlhofer, M., Steinbauer, G., Hirschmugl-Gaisch, S., & Huber, P. (2016). Artificial intelligence and computer science in education: From kindergarten to university. IEEE Frontiers in Education Conference (FIE), 1-9, doi: 10.1109/FIE.2016.7757570

Konishi, Y., & Y. (2015). What is needed for AI literacy? Priorities for the Japanese economy in 2016.

Laupichler, M. C., Aster, A., Schirch, J., & Raupach, T. (2022). Artificial intelligence literacy in higher and adult education: A scoping literature review. Computers and Education: Artificial Intelligence, 3, Article 100101. https://doi.org/10.1016/j.caeai.2022.100101

Lee, I., Ali, S., Zhang, H., DiPaola, D., & Breazeal, C. (2021). Developing Middle School Students' AI Literacy. In Proceedings of the 52nd ACM Technical Symposium on Computer Science Education (SIGCSE '21), March 13–20, 2021, Virtual Event, USA. ACM, New York, NY, USA, 7 pages. https://doi.org/10.1145/3408877.3432513

Long, D., & Megerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. CHI '20: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, 1–16, https://doi.org/10.1145/3313831.3376727

Luckin, R., Cukurova, M., Kent, C., du Boulay, B. (2022). Empowering educators to be AI-ready, Computers and Education: Artificial Intelligence, 3, Article 100076, https://doi.org/10.1016/j.caeai.2022.100076.

Ma, Yizhi & Siau, Keng L. (2018). Artificial Intelligence Impacts on Higher Education. MWAIS 2018 Proceedings. 42. Proceedings of the Thirteenth Midwest Association for Information Systems Conference, Saint Louis, Missouri May 17-18, 2018

Markauskaite, L., Marrone, R., Poquet, O., Knight, S., Martinez-Maldonado, R., Howard, S., Tondeur, J., De Laat, M., Buckingham, S., Dragan Gašević, S., & Siemens, G. (2022). Rethinking the entwinement between artificial intelligence and human learning: What capabilities do learners need for a world with AI?, Computers and Education: Artificial Intelligence, 3, Article 100056, https://doi.org/10.1016/j.caeai.2022.100056.

Merrit, R., 2021. AI Vision guides University of Florida's rise in college rankings. Retrieved from: https://blogs.nvidia.com/blog/2021/09/14/university-of-florida-rankings-ai/. Accessed October 18, 2022

National Academies of Sciences, Engineering, and Medicine (NASEM) (2018). *Data Science for Undergraduates: Opportunities and Options.* Washington, DC: The National Academies Press, pp 138, https://doi.org/10.17226/25104.

National Security Commission on Artificial Intelligence (NSCAI) (2021). Final Report. Retrieved from: https://www.nscai.gov/2021-final-report/. Accessed October 18, 2022

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review, Computers and Education: Artificial Intelligence, 2, Article 100041, https://doi.org/10.1016/j.caeai.2021.100041.

PEGA. (2022). 101 Artificial Intelligence Statistics. Retrieved from: https://techjury.net/blog/ai-statistics/#gref. Accessed October 18, 2022

Russell, S. J., & Norvig, P. (1995). *Artificial intelligence - a modern approach: the intelligent agent book.* Englewood Cliffs, N.J., Prentice Hall.

Samara, D., Magnisalis, I., & Peristeras, V. (2020). Artificial intelligence and big data in tourism: A systematic literature review. Journal of Hospitality and Tourism Technology, 11(2), 343-367. https://doi.org/10.1108/JHTT-12-2018-0118

Southworth, J., K.W. Migliaccio, J. Glover, J. Glover, D. Reed, C. McCarty, J. Brendemuhl, and A. Thomas. 2023. Developing a model for AI Across the Curriculum: Transforming the Higher Education Landscape via Innovation in AI Literacy. Computers & Education: Artificial Intelligence. Volume 4, 100127, https://doi.org/10.1016/j.caeai.2023.100127.

St Louis, A. T., Thompson, P., Sulak, T. N., Harvill, M. L., & Moore, M. E. (2021). Infusing 21st Century Skill Development into the Undergraduate Curriculum: The Formation of the iBEARS Network. Journal of Microbiology & Biology Education, 22(2), Article e00180-21. doi: 10.1128/jmbe.00180-21.

Su, J., Zhong, Y., & Ng, D. T. K. (2022). A meta-review of literature on educational approaches for teaching AI at the K-12 levels in the Asia-Pacific region, Computers and Education: Artificial Intelligence, 3, Article 100065, https://doi.org/10.1016/j.caeai.2022.100065.

University of Florida. (2020). Accountability Plan. Retrieved from: https://www.flbog.edu/board/accountability-plans/. Accessed October 18, 2022

University of Florida. (2021a). Accountability Plan. Retrieved from: https://www.flbog.edu/board/accountability-plans/. Accessed October 18, 2022

University of Florida. (2021b). Your pathway to AI. Retrieved from: https://ai.ufl.edu/academics/. Accessed April 7, 2023

Wong, Z.S., Zhou, J., & Zhang, Q. (2019). Artificial Intelligence for Infectious Disease Big Data Analytics. Infect Dis Health 24(1), 44-48. 10.1016/j.idh.2018.10.002

World Economic Forum. (2022). Global Issue: Artificial Intelligence. Curation: Desautels Faculty of Management, McGill University. Retrieved from: Strategic Intelligence (weforum.org). Accessed October 18, 2022

Xia, Q., Chiu, T.K.F., Lee, M., Sanusi, I.T., Dai, Y., & Chai, C.S., (2022). A self-determination theory (SDT) design approach for inclusive and diverse artificial intelligence (AI) education, Computers & Education, 189, Article 104582, https://doi.org/10.1016/j.compedu.2022.104582.

Yi, Y. (2021). Establishing the concept of AI literacy: Focusing on competence and purpose. Jahr – European Journal of Bioethics, Artificial Intelligence Humanities (AIH special section, 12(2), 353–368. https://doi.org/10.21860/j.12.2.8

Zimmerman, M. (2018). *Teaching AI: Exploring New Frontiers for Learning.* Portland, OR: International Society for Technology in Education.

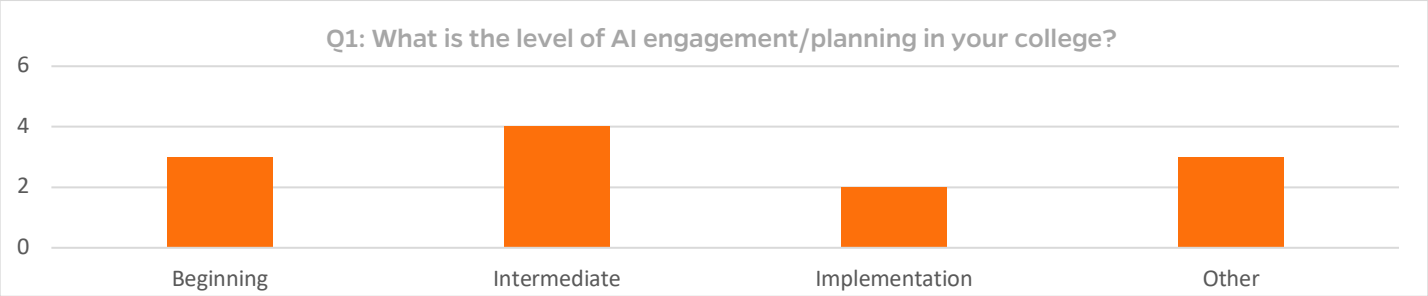
APPENDICES

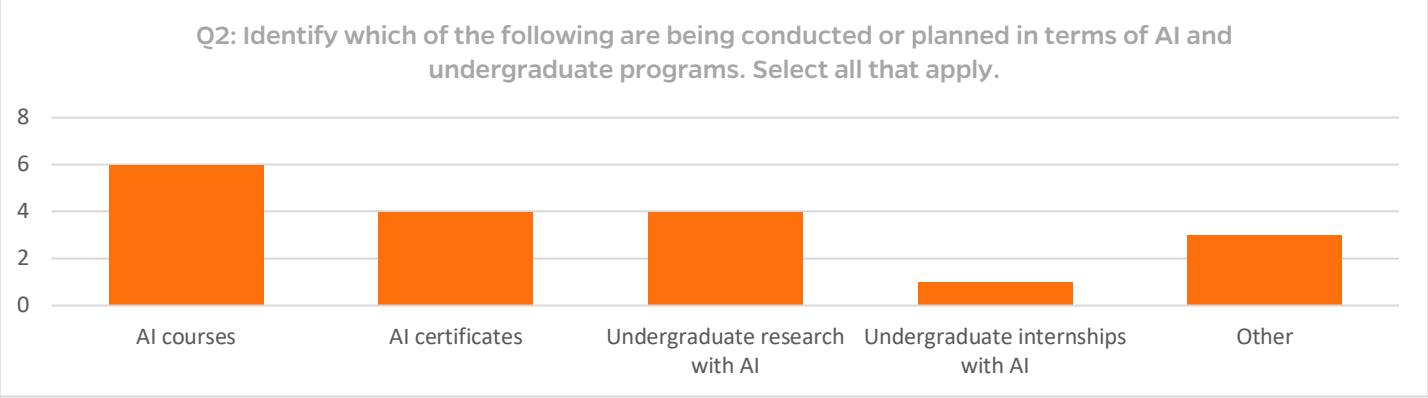
APPENDIX A: QUESTIONS FOR SURVEY OF UF COLLEGE DEANS

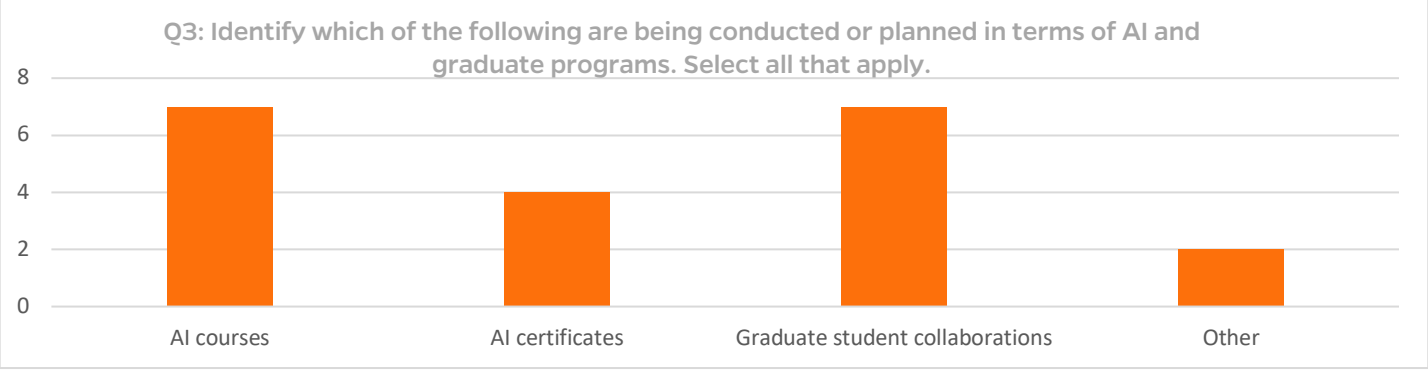
A.1.A. SURVEY FOR COLLEGE DEANS

1. What is the level of AI engagement/planning in your college?
2. Identify which of the following are being conducted or planned in terms of AI and undergraduate programs. Select all that apply. (All courses, AI certificates, undergraduate research with AI, undergraduate internships with AI, others)
3. Identify which of the following are being conducted or planned in terms of AI and graduate programs. Select all that apply. (AI courses, AI certificates, Graduate student collaborations –industry, internships, research, other)
4. Do you have a program/initiative focused on AI that you feel could have potential as a UF-wide program/initiative related to teaching and/or student learning?
5. If you were to identify a goal for your students in terms of AI for the next 5 years and the next 10 years, what would it be?
6. What is the biggest weakness you see in the AI initiative across curriculum and learning?
7. What is the biggest strength you see in the AI initiative across curriculum and learning?

A.1.B. SURVEY RESULTS FOR COLLEGE DEANS







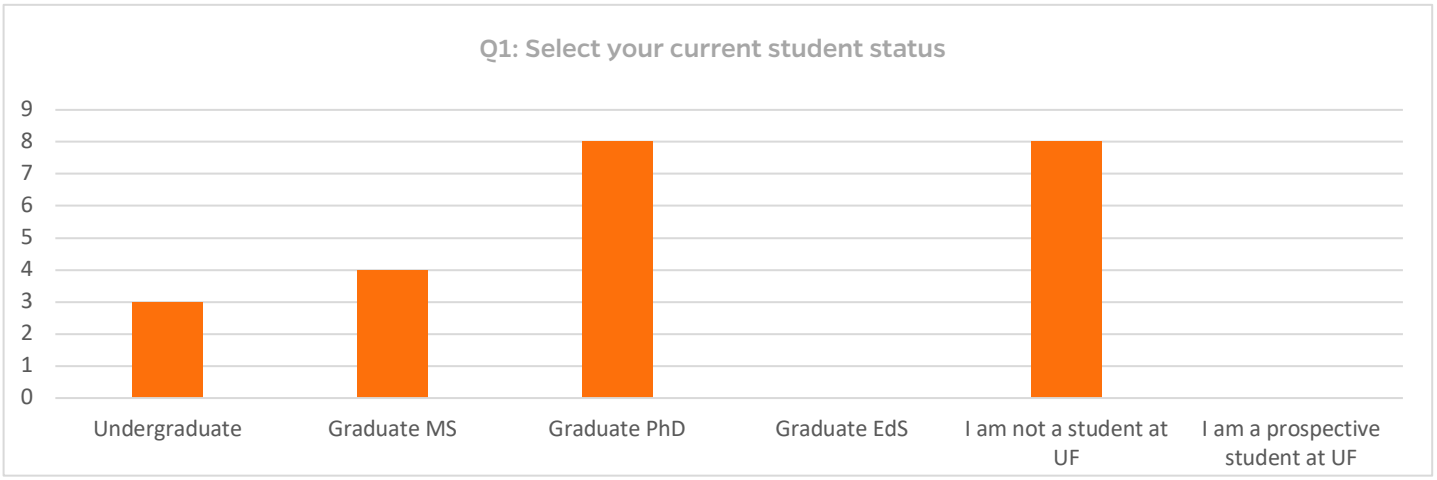
APPENDIX B: SURVEY OF UF FACULTY & STAFF AND STUDENTS

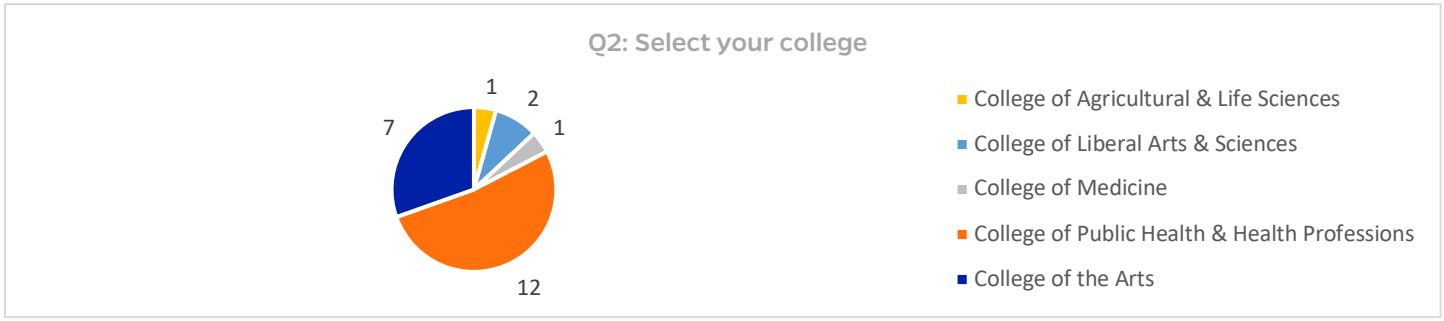
B.1.A. SURVEY FOR STUDENTS

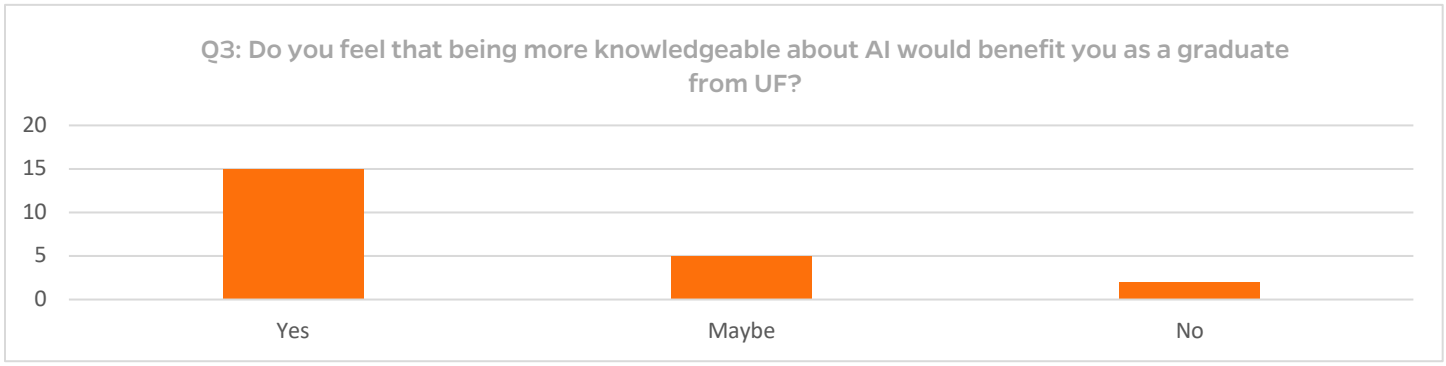
The UF Artificial Intelligence Across the Curriculum is a comprehensive, institution-wide project that is inclusive of all students and integrates initiatives in the Graduate School, professional colleges, and relevant institutes and centers. This effort is coordinated by the new AI Academic Initiatives Center. As part of this AI initiative, the UF QEP, or quality enhancement plan, is being developed which focuses on the undergraduate portion of AI Across the Curriculum at UF. The QEP is a requirement for accreditation of our academic programs and provides an opportunity to enhance student learning opportunities. The purpose of this survey is collecting additional information about the levels of interest in AI initiatives among members of the UF community. As students, your opinion is crucial as we advance our AI across the Curriculum efforts and finalize a QEP for UF. Please complete this survey after watching the QEP presentation.

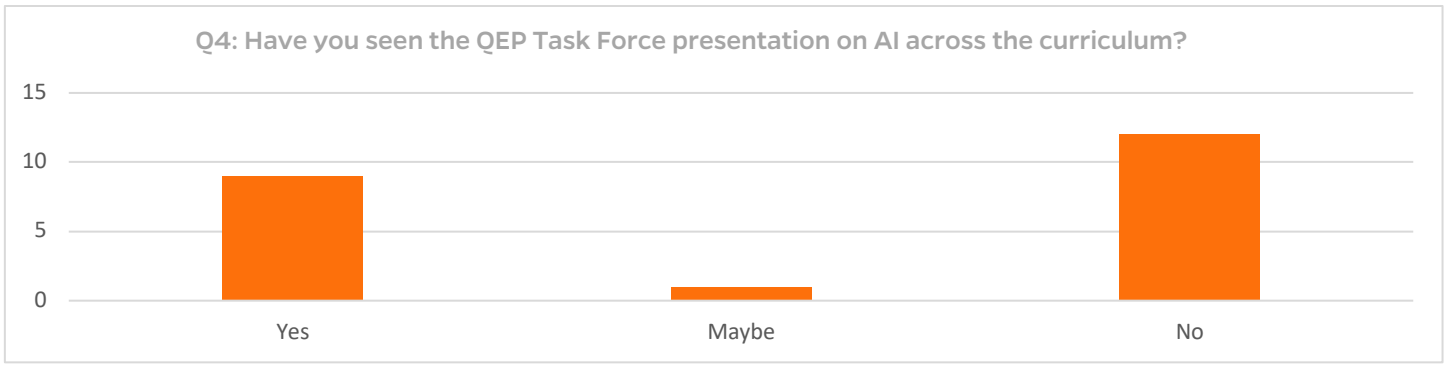
1. Select your current student status
2. Select your college
3. Do you feel that being more knowledgeable about AI would benefit you as a graduate from UF?
4. Have you seen the QEP Task Force presentation on AI across the curriculum?
5. The QEP Task Force has identified five initiatives that are being explored: AI Academic Initiatives Center, Curriculum Development, Certificate Programs, AI Scholars, Career Center and Workforce Development. For each initiative, can you indicate how likely you feel it would benefit students?
6. There are different topics to consider when thinking about developing AI skills. These include AI ethics, know and understand AI, use and apply AI, evaluate and create AI. Please indicate your interest level in developing knowledge and skills for each topic.
7. Do you feel there is an initiative or concept missing that would be critical to this QEP?
8. Please provide missing initiative or concept and any additional information.
9. Please provide missing initiative or concept and any additional information.
10. What do you think is the best way to advertise the QEP benefits to students? a. social media, b. tabling at union, c. videos, d. email, e. other
11. Please share additional venues to advertise the QEP benefits to students?
12. How you see AI in your discipline or profession?

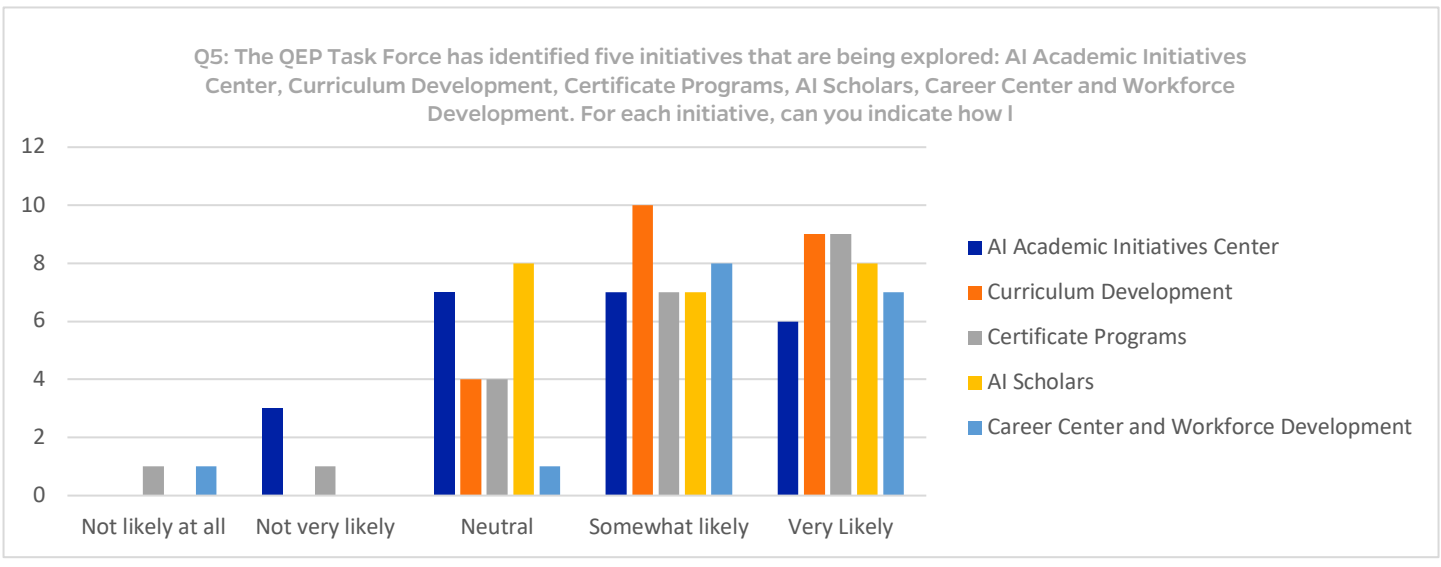
B.1.B. STUDENT SURVEY DATA

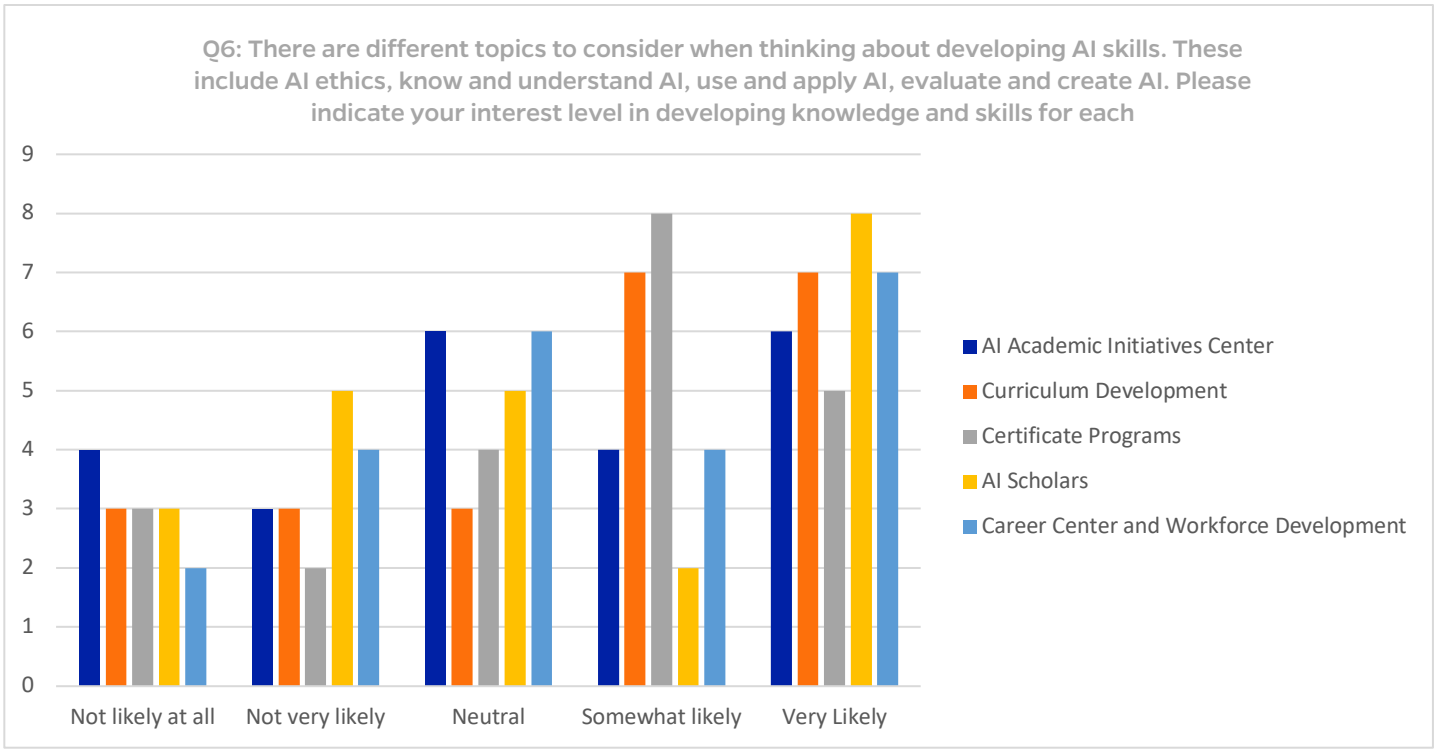


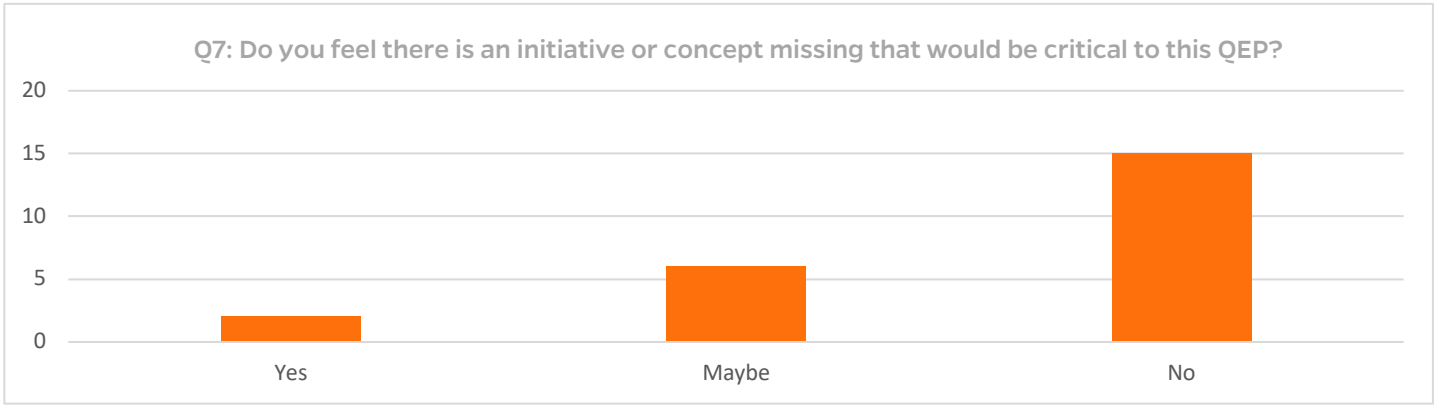

Q2: Select your college
1
2
1
7
12
College of Agricultural & Life Sciences
College of Liberal Arts & Sciences
College of Medicine
College of Public Health & Health Professions
College of the Arts

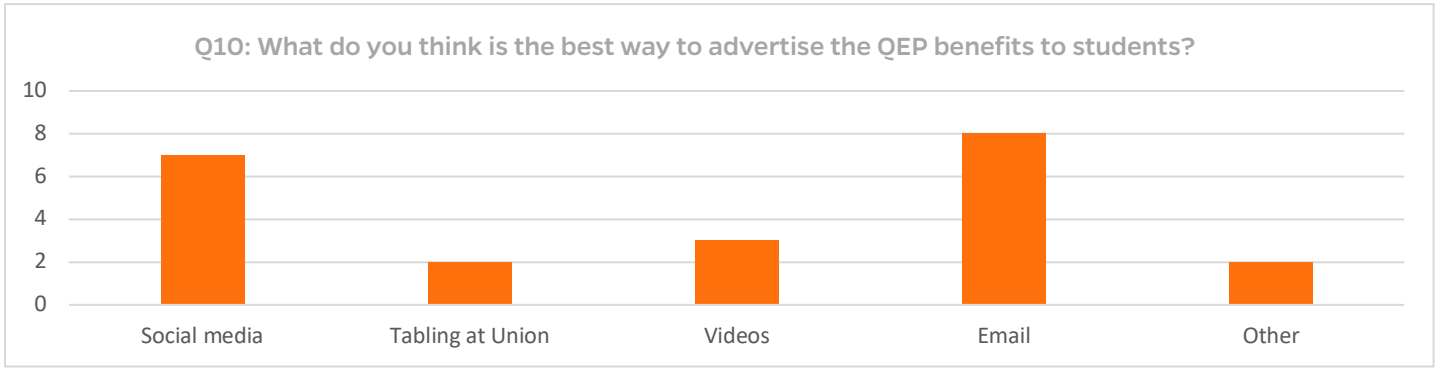

Q3: Do you feel that being more knowledgeable about AI would benefit you as a graduate from UF?
20
15
10
5
0
Yes
Maybe
No


Q4: Have you seen the QEP Task Force presentation on AI across the curriculum?
15
10
5
0
Yes
Maybe
No


Q5: The QEP Task Force has identified five initiatives that are being explored: AI Academic Initiatives Center, Curriculum Development, Certificate Programs, AI Scholars, Career Center and Workforce Development. For each initiative, can you indicate how l
12
10
8
6
4
2
0
Not likely at all
Not very likely
Neutral
Somewhat likely
Very Likely
AI Academic Initiatives Center
Curriculum Development
Certificate Programs
AI Scholars
Career Center and Workforce Development


Q6: There are different topics to consider when thinking about developing AI skills. These include AI ethics, know and understand AI, use and apply AI, evaluate and create AI. Please indicate your interest level in developing knowledge and skills for each
9
8
7
6
5
4
3
2
1
0
Not likely at all
Not very likely
Neutral
Somewhat likely
Very Likely
AI Academic Initiatives Center
Curriculum Development
Certificate Programs
AI Scholars
Career Center and Workforce Development


Q7: Do you feel there is an initiative or concept missing that would be critical to this QEP?
20
15
10
5
0
Yes
Maybe
No

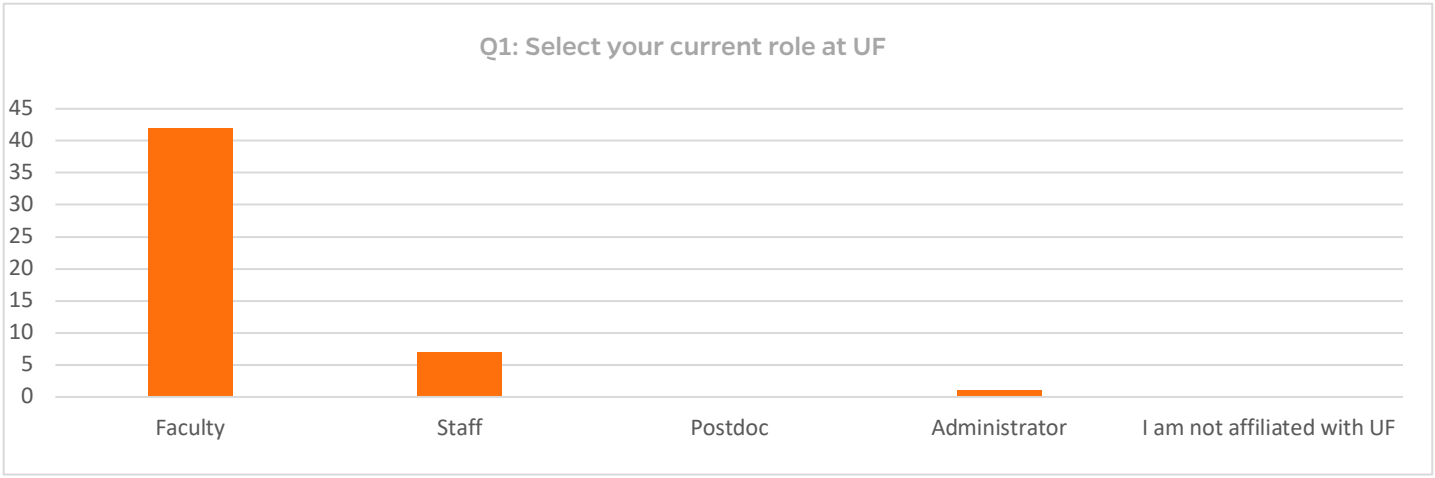

Q10: What do you think is the best way to advertise the QEP benefits to students?
10
8
6
4
2
0
Social media
Tabling at Union
Videos
Email
Other

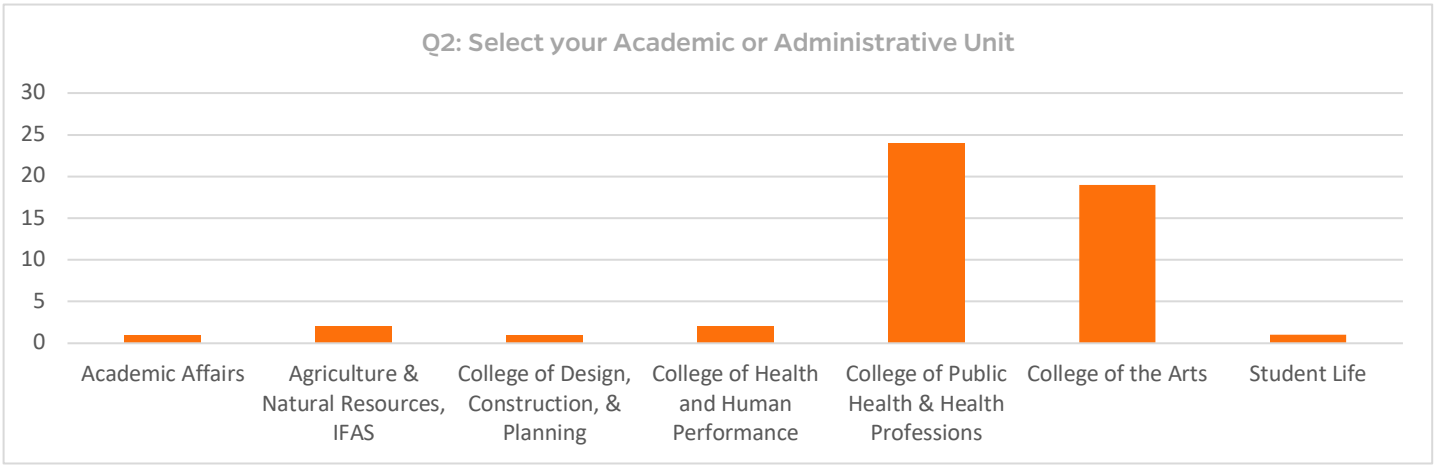
B.2.A SURVEY FOR FACULTY & STAFF

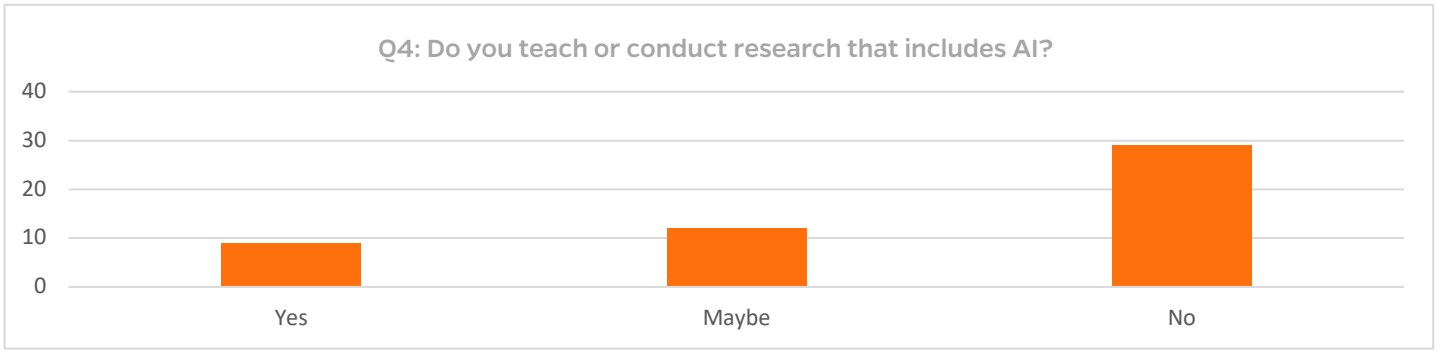
The UF Artificial Intelligence Across the Curriculum is a comprehensive, institution-wide project that is inclusive of all students and integrates initiatives in the Graduate School, professional colleges, and relevant institutes and centers. This effort is coordinated by the new AI Academic Initiatives Center. As part of this AI initiative, the UF QEP, or quality enhancement plan, is being developed which focuses on the undergraduate portion of AI Across the Curriculum at UF. The QEP is a requirement for accreditation of our academic programs and provides an opportunity to enhance student learning opportunities. The purpose of this survey is collecting additional information about the levels of interest in AI initiatives among members of the UF community. As faculty and staff, your opinion is crucial as we advance our AI across the Curriculum efforts and finalize a QEP for UF. Please complete this survey after watching the QEP presentation.

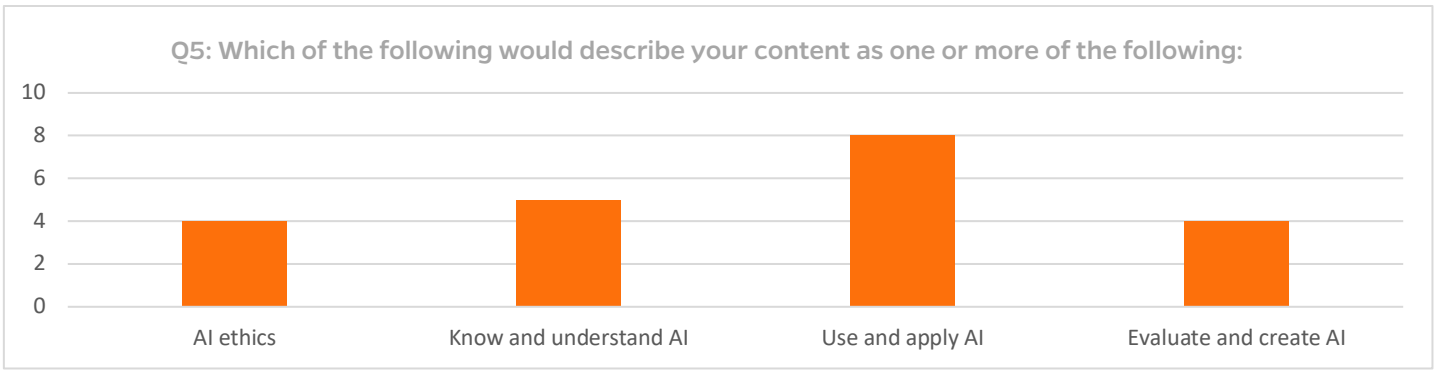
1. Select your current role at UF.
2. Select your Academic or Administrative Unit.
3. Do you teach or conduct research that includes AI?
4. Which of the following would describe your content as one or more of the following: a. AI ethics; b. Know and understand AI, c. Use and apply AI, d. Evaluate and create AI
5. Would you be interested in incorporating AI components into your teaching or research program?
6. Have you seen the QEP Task Force presentation on AI across the curriculum?
7. The QEP Task Force has identified five initiatives that it is developing: AI Academic Initiatives Center, Curriculum Development, Certificate Programs, AI Scholars, Career Center and Workforce Development. For each, indicate how interested you are in the particular initiatives?
8. For the same list of initiatives, can you indicate how likely you feel each would benefit students?
9. Do you feel there is an initiative or concept missing that would be critical to this QEP?
10. Please provide missing initiative or concept and any additional information.
11. Please provide missing initiative or concept and any additional information.
12. What do you think is the best way to advertise the QEP benefits to students? a. social media, b. tabling at union, c. videos, d. email, e. other
13. Please share additional venues to advertise the QEP benefits to students?
14. How do you see AI in your discipline or profession?

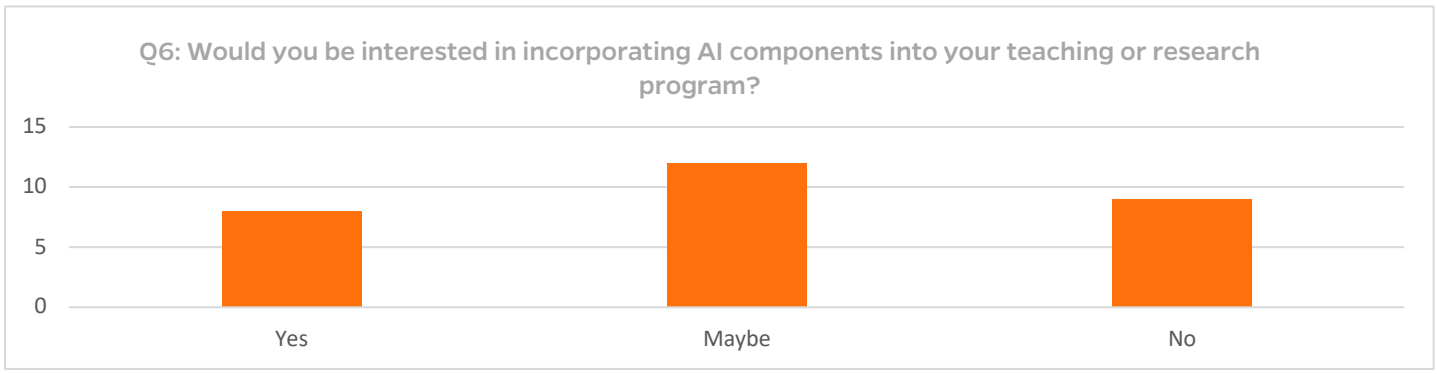
B.2.B. FACULTY & STAFF SURVEY DATA

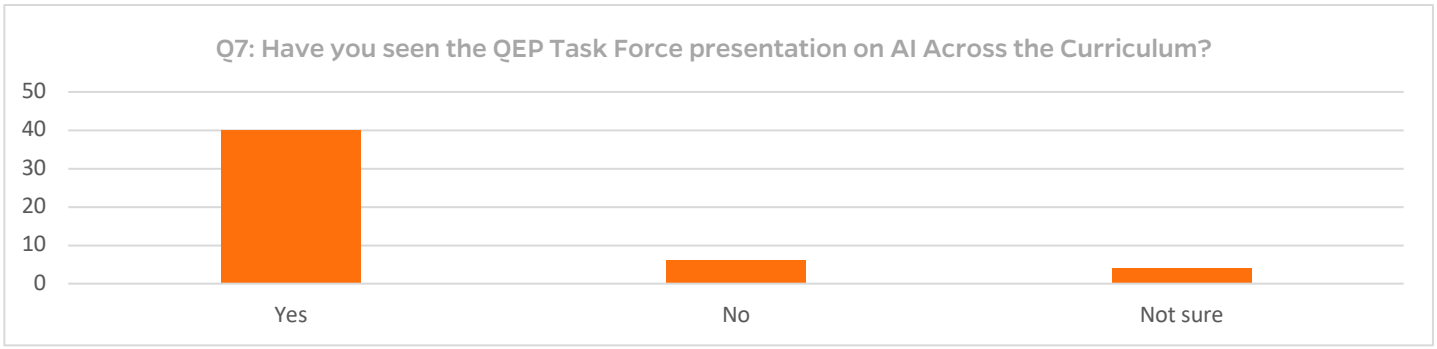


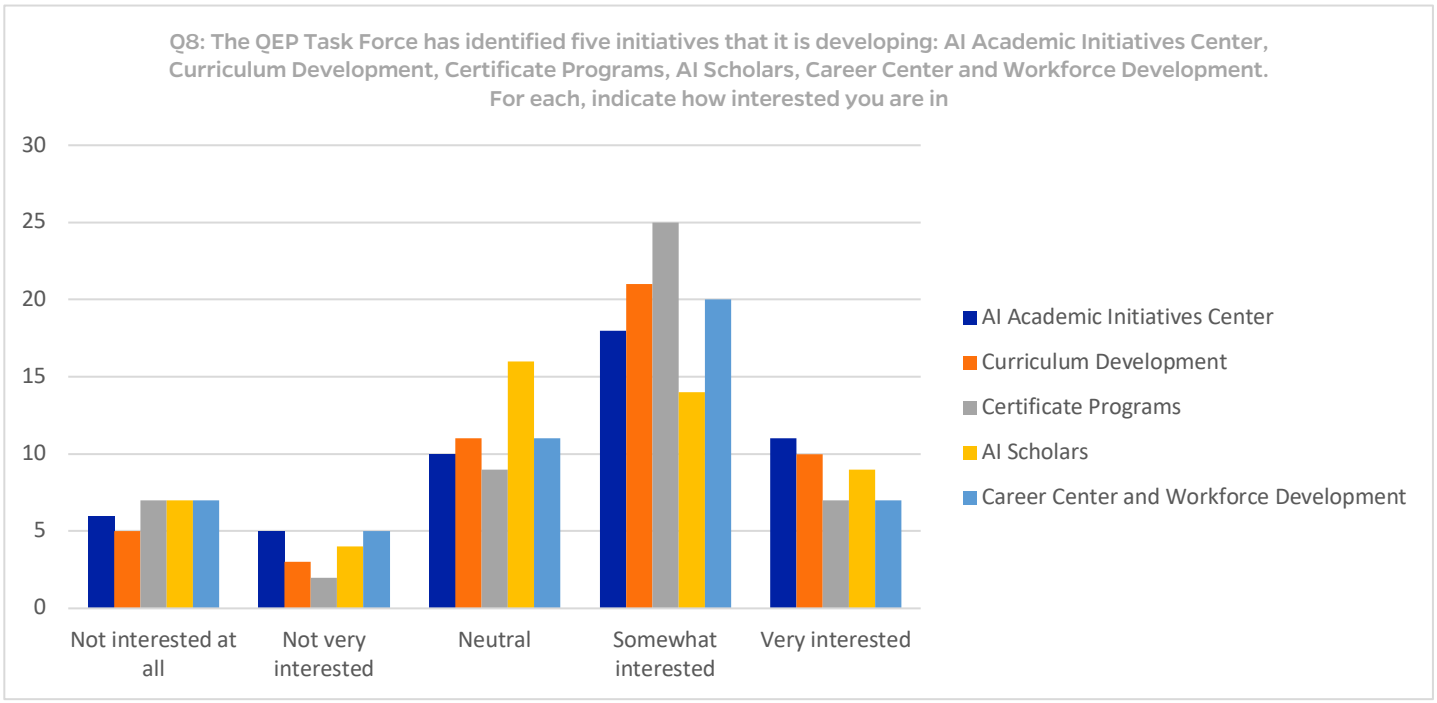

Q2: Select your Academic or Administrative Unit
30
25
20
15
10
5
0
Academic Affairs
Agriculture & Natural Resources, IFAS
College of Design, Construction, & Planning
College of Health and Human Performance
College of Public Health & Health Professions
College of the Arts
Student Life

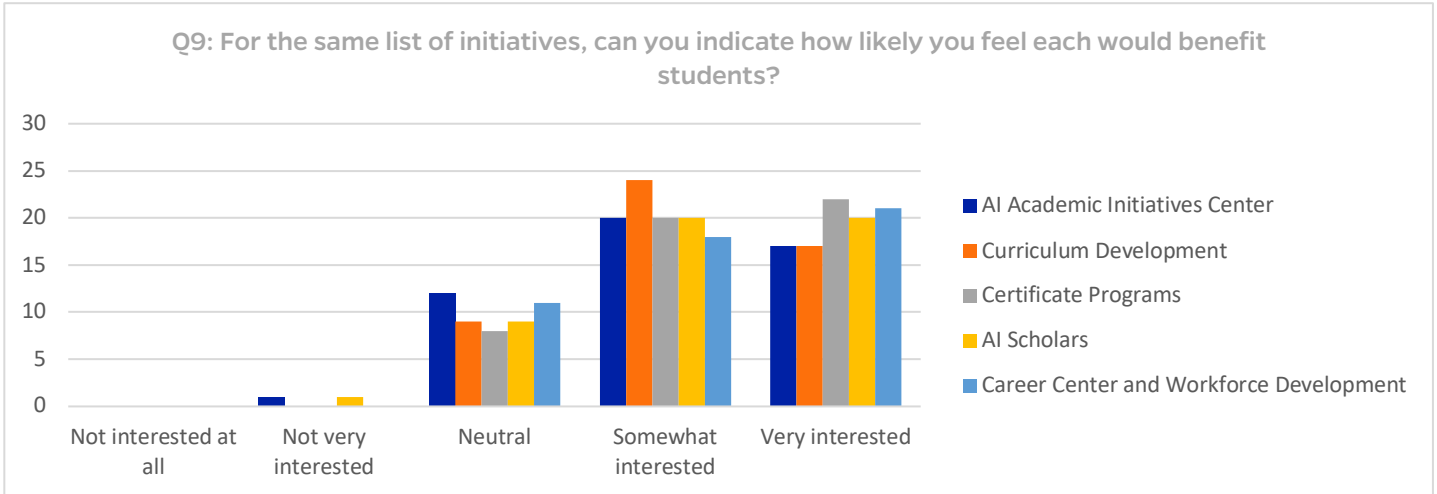

Q4: Do you teach or conduct research that includes AI?
40
30
20
10
0
Yes
Maybe
No

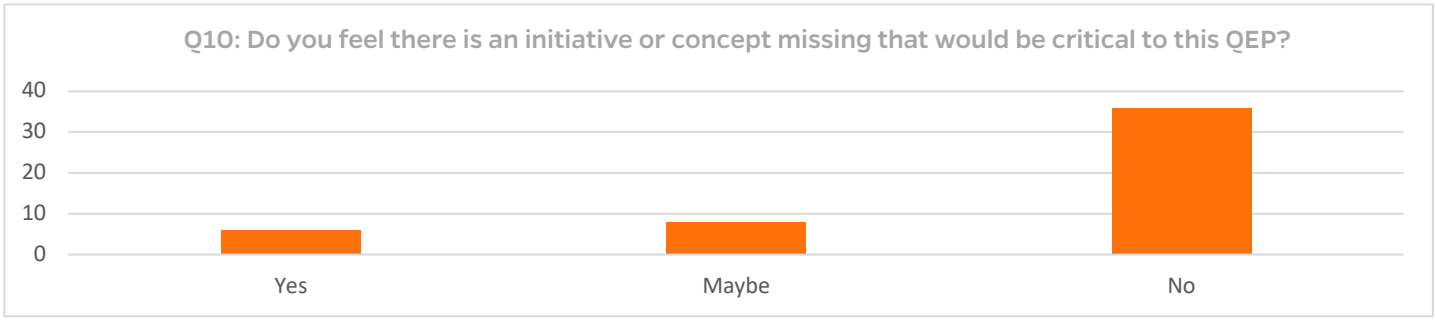

Q5: Which of the following would describe your content as one or more of the following:
10
8
6
4
2
0
AI ethics
Know and understand AI
Use and apply AI
Evaluate and create AI

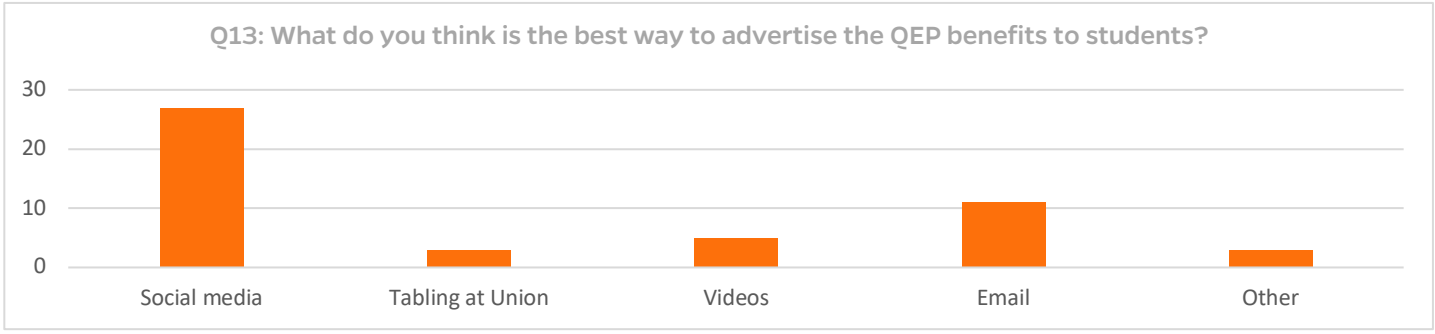

Q6: Would you be interested in incorporating AI components into your teaching or research program?
15
10
5
0
Yes
Maybe
No


Q7: Have you seen the QEP Task Force presentation on AI Across the Curriculum?
50
40
30
20
10
0
Yes
No
Not sure


Q8: The QEP Task Force has identified five initiatives that it is developing: AI Academic Initiatives Center, Curriculum Development, Certificate Programs, AI Scholars, Career Center and Workforce Development. For each, indicate how interested you are in
30
25
20
15
10
5
0
Not interested at all
Not very interested
Neutral
Somewhat interested
Very interested
AI Academic Initiatives Center
Curriculum Development
Certificate Programs
AI Scholars
Career Center and Workforce Development


Q9: For the same list of initiatives, can you indicate how likely you feel each would benefit students?
30
25
20
15
10
5
0
Not interested at all
Not very interested
Neutral
Somewhat interested
Very interested
AI Academic Initiatives Center
Curriculum Development
Certificate Programs
AI Scholars
Career Center and Workforce Development





APPENDIX C: AI COURSE DESIGNATION REQUEST FORM

UF | Academic Approval UNIVERSITY of FLORIDA

START NEW REQUEST | REPORTS | POLICIES | HELP | CONTACT

Course|New|Ugrad|AI

AI Course Designation Request Form

ARTIFICIAL INTELLIGENCE (AI)

The term "artificial intelligence" means a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations or decisions. One way to think of AI is as a computer system that can perform tasks that would typically require human intelligence, such as understanding natural language, recognizing objects in images, making decisions, and playing games. AI systems can be trained using large amounts of data and a process called machine learning and can improve over time as it is exposed to more data.

In a university course on AI, students will typically learn about topics including but not limited to:

- The history and foundations of AI
- Problem-solving techniques, such as search and planning
- Knowledge representation and reasoning, including formal logic and ontologies
- Machine learning, including supervised, unsupervised, and deep learning
- Natural language processing, including you understand and generate human language
- Perception, including computer vision and sensor-based AI
- Robotics, including robot planning and control
- Ethical, legal, policy, and other social implications of AI
- How to design and implement AI systems
- Theoretical and practical issues related to AI systems

If you teach a course that you are submitting for AI designation and do not see your course AI topic listed, please contact us at ai@ufl.edu.

A submitter must acknowledge the following requirements in order to request an AI designation for a course. Please check each box to acknowledge this requirement.

Canvas Availibility Required

Courses submitted for AI designation must be available in Canvas.

○ **Yes, I acknowledge this requirement.**

Assessment Data Required

Courses with AI designation must participate in assessment data collection by integrating specific SLO(s) based on the category designation chosen for the use of the UF AI Across the Curriculum Quality Enhancement Plan. (click link for more information and instructions - not yet developed) Check box to acknowledge this requirement.

○ **Yes, I acknowledge this requirement.**

Weekly schedule and Assignments Required

Courses submitted for AI designation must include a weekly schedule of topics and some description of each assignment. Topics and assignments that directly relate to meeting SLO(s) should be clearly noted with the specific SLO(s) in the syllabi.

○ **Yes, I acknowledge this requirement.**

Course Prefix and Number Required

Enter the three letter prefix, four-digit course number, and lab code (if applicable), as the course appears in the Academic Catalog (or as it has been approved by SCNS, if the course is not yet listed in the catalog).

If the course has been approved by the UCC but is still pending at SCNS, enter the proposed course prefix and level, but substitute XXX for the course number; e.g., POS2XXX.

Course Title Required

Enter the title of the course as it appears in the Academic Catalog (or as it has been approved by SCNS, if the course is not yet listed in the catalog, or as it was approved by the UCC, if the course has not yet been approved by SCNS). There is a 100 character limit for course titles.

Lab Code Required

Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

None

Saved

Delivery Method Required

Please indicate the delivery methods for this course (check all that apply). Please note that content and learning outcome assessment must be consistent regardless of delivery method.

- ☐ **Classroom**
- ☐ **Flexible Learning**
- ☐ **Hybrid**
- ☐ **Online**
- ☐ **UF Online Program**

Effective Term Required

Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Select...

Effective Year Required

Select...

Credit Hours Required

Select the number of credits awarded to the student upon successful completion. Note that variable credit courses are not eligible for GE or WR certification.

Select...

Prerequisites

Please list any prerequisites for this course.

AI Percentile Designation Required

- ○ **This course contains 50% or greater AI-related content and/or assignments.**
- ○ **This course contains greater than 10% and less than 50% AI-related content.**

Requested AI Categories Required

(choose only 1 category)

Indicate the requested AI category designation for this course. Categories Know-AI, Use-AI, Build-AI, and Ethical-AI require 50% of course content to be related to AI and faculty must indicate which category best fits the course content. Category Enable-AI would be selected if greater than 10% and less than 50% of the course content is related to AI.
(link to category description webpage, not created yet)

If you want to request multiple AI categories, contact the chair of the AI Curriculum Committee at ai@ufl.edu for guidance.

- ○ **Know-AI: Know and Understand AI**
- ○ **Use-AI: Use and Apply AI**
- ○ **Build-AI: Evaluate and Create AI**
- ○ **Ethical-AI: AI Ethics**
- ◉ **Enable-AI: AI Enabled**

Saved

AI Enabled
Courses which are not completely AI focused, but rather are enriching and enabling AI knowledge and skills through complementary skills and/or knowledge. AI course content is 10-49%.

AI Student Learning Outcomes

The AI SLOs describe the knowledge, skills and attitudes that students are expected to acquire while completing an AI course at the University of Florida.

Inclusion of the verbatim statements for the SLO(s) corresponding to the AI category is a required component of AI courses and syllabi.

FOR EACH SELECTED SLO, additional information is required including a proposed assessment of the SLO with a specific course assignment.

AI Enabled
Any of the six SLOs previously mentioned. The difference here is simply in the amount (%) of content covered in the course. Any of the above AI types can be covered under the AI Enabled category.

SLO Statement Requirement Required

Inclusion of the verbatim statements for the SLO(s) corresponding to the AI category is a required component of AI courses and syllabi.

- ○ **I understand and agree to include the required statements in the course syllabus.**

Rationale for the AI Category Required

Please provide a rationale for the AI category selected. Inclusion of this explanation is a required component of AI courses and syllabi.

Course Description Required

Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is **limited to 500 characters or less**. See course description guidelines. Please do not start the description with "This course.."

Course Objectives Required

Describe the core knowledge and skills that student should derive from the course. The objectives should be both observable and measurable.

Instructor(s) Required

Enter the name of the planned instructor or instructors. or "to be determined" if instructors are not yet identified.

Required Links and Policies

Please acknowledge that the following links and policies will be included in the course syllabus and all required University policies will be adhered too.

For more information please visit the following webpage: syllabus.ufl.edu

Attendance & Make-up Required

Please confirm that you have read and understand the University of Florida Attendance policy.

A required statement statement related to class attendance, make-up exams and other work will be included in the syllabus and adhered to in the course. Courses may not have any policies which conflict with the University of Florida policy. The following statement may be used directly in the syllabus.

- Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

○ Yes
○ No

Accomodations

Please confirm that you have read and understand the University of Florida Accommodations policy.

A statement related to accommodations for students with disabilities will be included in the syllabus and adhered to in the course. The following statement may be used directly in the syllabus:

- Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Select...

UF Grading Policies for assigning Grade Points Required

Please confirm that you have read and understand the University of Florida Grading policies.

Information on current UF grading policies for assigning grade points is require to be included in the course syllabus. The following link may be used directly in the syllabus:

- https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Select...

Course Evaluation Policy Required

Course Evaluation Policy

Please confirm that you have read and understand the University of Florida Course Evaluation Policy.

A statement related to course evaluations will be included in the syllabus. The following statement may be used directly in the syllabus:

- Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Select...

Please consider including the recommended content from section C of the UF syllabus policy in the course syllabus.

- Critical Dates
- Class Demeanor
- UF Honesty policy
- Campus Resources
  - Health and Wellness
  - Academic Resources

Continue

APPENDIX D: BOG REGULATION 8.016

8.016 STUDENT LEARNING OUTCOMES ASSESSMENT

1) Policies and Procedures
   a. Each board of trustees shall require its university to establish a process for certifying that each baccalaureate graduate has completed a program with clearly articulated expected core student learning outcomes.
   b. Each university shall develop processes to ensure that:
      i. program faculty develop and publish an Academic Learning Compact for each baccalaureate program that, at a minimum,
         1. outlines expected core student learning outcomes in the areas of content/discipline knowledge and skills, communication skills, and critical thinking skills;
         2. takes into consideration perspectives of appropriate constituencies (including but not limited to potential employers and graduate programs) regarding the knowledge and skills graduates need in the global marketplace and society; and
         3. lists the types of assessments students may encounter in the program (e.g., capstone projects, juried performances, standardized exams, common embedded exam questions, portfolio requirements, etc.);
      ii. program faculty develop methods for assessing student achievement of the expected core student learning outcomes within the context of the program;
      iii. university personnel use program evaluation systems (which may include sampling) to evaluate the program and related assessment practices to analyze their efficacy in determining whether program graduates have achieved the expected core student learning outcomes; and
      iv. university personnel use the evaluation results to improve student learning and program effectiveness.
   c. As appropriate, this regulation shall support and be supported by regional and specialized accreditation efforts, as well as the program review procedures in Regulation 8.015.
2) Products
   a. A current hard copy or a URL (Web link) to an electronic version of the university-wide regulation or policy and related procedures regarding Academic Learning Compacts, related assessment mechanisms, program evaluation, and continuous improvement expectations shall be provided to the Board of Governors Office.
   b. Each Academic Learning Compact shall be made available (using student-friendly, jargon-free language) on the university's Web site.
   c. As requested by the Chancellor or the Chancellor's designee, university personnel shall submit to the Board of Governors Office periodic status reports on Academic Learning Compacts, related assessment mechanisms, program evaluation, and continuous improvement processes. The articulation and assessment of expected core student learning outcomes, as well as program evaluation and improvement, shall occur on a continuous basis.

Authority: Section 7(d), Art IX, Fla. Const.; History: New 3-29-07, Amended 01- 19-12.

APPENDIX E: QEP ASSESSMENT GUIDE FOR FACULTY

UF QEP AI ACROSS THE CURRICULUM

Faculty Guide and Rubric for UF Quality Enhancement Plan

The UF QEP Task Force - Assessment Subcommittee & Office of Institutional Assessment (OIA)

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UF AI ACROSS THE CURRICULUM: 2024-2029 QEP

Artificial Intelligence (AI) Across the Curriculum is a five-year Quality Enhancement Plan (QEP) focused on providing students with the resources and skills to become successful digital citizens and global collaborators (Zimmerman, 2018). This QEP will create campus wide opportunities and experiences for exploring AI, considering AI awareness and general knowledge, AI application and use in different disciplines, and AI foundational development and expertise. Many disciplines have been conducting AI programs at the University of Florida for years, however recent interest in its broader applications and transformational donor support has created a university-wide initiative focused on AI. Thus, a terrific opportunity exists to create an organizational structure and intentional processes to foster AI in the curriculum and other complementary academic programs.

UF AI ACROSS THE CURRICULUM MODEL

The foundation of the UF model is based on AI literacies as outlined by Ng et al., (2021). Ng et al. (2021) presented four literacy topics: 1) know and understand AI, 2) use and apply AI, 3) evaluate and create AI, and 4) AI ethics. These four core AI literacies are used to show the type of knowledge and skills students are gaining through learning experiences. For example, to "know and understand AI", students need to be able to explain what AI is and its potential implications. To "use and apply AI", students need to be able to use AI tools for problem-solving. To "evaluate and create AI", students need to be able to assess the impact of AI and create new AI applications. Finally, to be AI literate, students need to understand the ethical implications of AI or "AI ethics" (Borenstein & Howard, 2021; Dai et al., 2020; Kandlhofer et al., 2016; Long & Magerko, 2020; Ng et al., 2021; Zimmerman, 2018). A fifth category, "AI Enabled", was also identified to capture academic courses that support AI through related knowledge and skill development and/or contain a lower total AI content of one of the four core AI literacy topics.

The five AI literacy categories align with a variety of knowledge and skills that students can learn through different types of experiences. For example, students might learn about AI through reading texts, watching videos, or attending lectures. Alternatively, students might learn about AI through hands-on experiences, such as coding projects or data analysis. The UF model is designed to first clarify the different AI literacy categories presented in different academic activities (Dai et al., 2020; Kandlhofer et al., 2016; Long & Magerko, 2020; Ng et al., 2021). This allows students to build their expertise by selecting courses focused on literacies of their interest. Second, the UF model provides students with identified AI literacy categories by course that can be packaged to showcase student AI skills and 21st century competencies (Buckingham Shum & Deakin Crick, 2016; Cantú-Ortiz et al., 2020; Ng et al., 2021). Lastly, the AI course designation approach allows review of course offerings to identify gaps or needs to ensure AI learning opportunities are available for all undergraduate students. The five literacy categories are further described as:

- Know & Understand AI
  - Know the basic functions of AI and to use AI applications
  - *AI course content is over 50%*
- Use & Apply AI
  - Applying AI knowledge, concepts and applications in different scenarios
  - *AI course content is over 50%*
- Evaluate & Create AI
  - Higher-order thinking skills (e.g., evaluate, appraise, predict, design) with AI applications
  - *AI course content is over 50%*
- AI Ethics
  - Human-centered considerations (e.g., fairness, accountability, transparency, ethics, safety)
  - *AI course content is over 50%*

- AI Enabled
  - Courses which are not completely AI-focused, but rather are enriching AI knowledge and skills through complementary skills and/or knowledge
  - *AI course content is 10-49%*

THE QEP TASK FORCE & THE QEP ASSESSMENT SUBCOMMITTEE

A QEP Task Force of diverse individuals across campus was appointed and began to meet in November 2021. The task force was charged by the Director of Institutional Assessment to develop a five-year plan (2024-2029) that would provide all undergraduate students at UF the opportunity to acquire knowledge, skills, and applications in AI. A sub-committee, composed by members of the taskforce, was formed to develop the assessment plan for the QEP. This guide is a component of the QEP Assessment Plan.

ASSESSMENT

The assessment of the QEP relies on direct and indirect assessment of the student learning outcomes associated with the QEP/AI courses and assessment of the goals of the program. The subsequent section outlines the direct methods of assessment of the student learning outcomes.

QEP SLOs

The Task Force and the Assessment Subcommittee identified Student Learning Outcomes (SLOs) for the AI literacy topics proposed. The State of Florida Board of Governors (FL BOG) has mandated that all baccalaureate programs in the state public universities develop Academic Learning Compacts (ALCs) for each degree program that include SLOs in three areas: content knowledge, critical thinking, and communication. SLOs were developed to align with the AI Literacies and FL BOG requirements. The SLOs for the four literacies outline what students should know and be able to do by the time they complete a course. The AI SLOs by literacy are listed below:

- Know and Understand AI
  - SLO1. Identify, describe, and explain the components, requirements, and/or characteristics of AI. (Content knowledge and communication)
  - SLO2. Recognize, identify, describe, define and/or explain applications of AI in multiple domains. (Critical thinking and communication)
- Use and Apply AI
  - SLO3. Select and/or utilize AI tools and techniques appropriate to a specific context and application. (Critical thinking and content knowledge)
- AI Ethics
  - SLO4. Develop, apply, and/or evaluate contextually appropriate ethical frameworks to use across all aspects AI. (Critical thinking and content knowledge)
- Evaluate and Create AI
  - SLO5. Assess the context-specific value or quality of AI tools and applications. (Critical thinking)
  - SLO6. Conceptualize and/or develop tools, hardware, data, and/or algorithms utilized in AI solutions. (Critical thinking)

RUBRIC DEVELOPMENT

Due to the multifaceted nature and variability of AI applications within various disciplines across the university, the assessment sub-committee members agreed to develop a four-scale, holistic rubric for each SLO. In this rubric, each SLO is measured using four broadly described achievement levels. This allows faculty sufficient autonomy in rating, accommodates the variety of applications and discipline-specific skills in UF's over 200 unique programs, and provides actionable data for institutional review and use for improvement.

All AI designated courses must address at least one of the four AI literacies and at least one SLO for that literacy. When faculty submit AI courses for AI designation approval, they are required to identify the literacy(ies) addressed in their course. AI literacies for all courses are reviewed and approved by UF's established undergraduate curriculum approval process, which includes approval by Departments, College Curriculum Committees, AI Curriculum Committee and the University Curriculum Committee. Courses that have at least 50% of the curriculum addressing the one or more QEP SLOs listed and include assessments of those SLOs will be designated as "AI courses". To accommodate courses with 10-49% of the curriculum covering the AI SLOs, we have established a categorical designation of "Enable-AI."

The six rubrics in Table 1 define the performance indicators established for each SLO. Each rubric is based on a four-point scale where three (3) is the Target. A score of four (4) shows performance that exceeds the Target, and scores of two (2) or one (1) are below the Target.

RUBRIC TO ASSESS THE SLOs

The Assessment Subcommittee developed rubrics and performance indicators for each SLO. Each rubric is based on a four-point scale where three (3) is the Target. A score of four (4) shows performance that exceeds the Target, and scores of two (2) or one (1) are below the Target (Table 1).

Table 1. AI SLO Rubrics

SLO	4	3 (TARGET)	2	1
SLO1. Identify, describe, and/or explain the components, requirements, and/or characteristics of AI.	The student identifies, describes and/or explains all of the components, requirements, and/or characteristics of AI.	The student identifies, describes and/or explains most of the components, requirements, and/or characteristics of AI.	The student identifies, describes and/or explains a few of the components, requirements, and/or characteristics of AI but does not identify, describe and/or explain many.	The student does not identify, describe and/or explain any of the components, requirements, and characteristics of AI.
SLO2. Identify, describe, define and/or explain applications of AI in multiple domains.	The student identifies, describes, defines and/or explains all of the applications	The student identifies, describes, defines and/or explains most of the applications of AI in multiple domains.	The student identifies, describes, defines and/or explains few of the applications of AI in multiple domains but does not identify,	The student does not, identify, describe, define and/or explain any of the applications of AI in multiple domains.

	of AI in multiple domains.		describe and/or explain many.	
SLO3. Select and/or utilize AI tools and techniques appropriate to a specific context and application.	The student selects and/or utilizes all of the AI tools and techniques appropriate to a specific context and application.	The student selects and/or utilizes most of the AI tools and techniques appropriate to a specific context and application.	The student selects and/or utilizes few of the AI tools and techniques appropriate to a specific context and application but does not select and/or utilize many.	The student does not select and/or utilize any of the AI tools and techniques appropriate to a specific context and application.
SLO4. Develop, apply, and/or evaluate contextually appropriate ethical frameworks to use across all aspects of AI.	The student develops, applies, and/or evaluates all of the contextually appropriate ethical frameworks to use within AI.	The student develops, applies, and/or evaluates most of the contextually appropriate ethical frameworks to use within AI.	The student develops, applies, and/or evaluates a few of the contextually appropriate ethical frameworks to use within AI.	The student does not develop, apply, and/or evaluate any of the contextually appropriate ethical frameworks to use within AI.
SLO5. Assess the context-specific value or quality of AI tools and applications.	The student assesses all of the context-specific value or quality of AI tools and applications.	The student assesses most of the context-specific value or quality of AI tools and applications.	The student assesses a few of the context-specific value or quality of AI tools and applications.	The student does not assess any of the context-specific value or quality of AI tools and applications.
SLO6. Conceptualize and/or develop tools, hardware, data, and/or algorithms utilized in AI solutions.	The student conceptualizes and/or develops all tools, hardware, data, and/or algorithms utilized in AI solutions.	The student conceptualizes and/or develops most of the tools, hardware, data, and/or algorithms utilized in AI solutions.	The student conceptualizes and/or develops a few of the tools, hardware, data, and/or algorithms utilized in AI solutions.	The student does not conceptualize or develop any of the tools, hardware, data, and/or algorithms utilized in AI solutions.

PROCEDURES FOR DIRECT ASSESSMENT OF SLOs

The QEP assessment procedure is based on faculty scoring selected artifacts using AI SLO rubrics. Instructional designers assist faculty members in associating the AI SLO rubrics with their course "chosen" assignment. Once the AI SLO rubrics are completed by instructors, the SLO assessment data will be stored in a *Learning Management Gradebook* in Canvas. UF IT generates a data report per term that is shared with the QEP/AI^2 Center administration (QEP Director, AI^2 Center Project Manager, OIA). Results from this report will be included in the Institutional Effectiveness report submitted to the Office of Institutional Assessment (OIA) annually as part of the internal institutional effectiveness process (First Year report due in Fall 2025). As part of the reporting process the QEP Assessment Administration analyzes and disseminates results among college AI leaderships to determine the impact of the QEP AI across the colleges.

QEP Assessment Administration would be responsible for the following activities each Fall for the QEP:

- Randomly select a sample of 20% of the students in each section of QEP AI designated courses (Note: the 20% sample ensures assessment of the QEP program while not allowing reporting of individual students or faculty, minimizing the stakes for faculty and students. It also minimizes the scoring time for faculty.)

- Train instructional designers for the assessment system and arrange for instructional designers to work with faculty to understand the assessment system and faculty responsibilities.
- Develop Learning Management System (LMS) in Canvas for data collection.
- Data management, analysis, coordination of review retreats, and dissemination of annual impact report among colleges.

Faculty would be responsible for the following:

- Identify course assignment(s) to measure AI SLOs.
- Review the QEP Assessment Guide and rubrics.
- Work with instructional designers to associate AI SLO rubrics with course assignments (CITT and COIP).
- Score the 20% sample selected for the course using the AI SLO rubrics as part of their regular grading in their course.
- Provide feedback on the process so that it can be modified and improved.

EXAMPLES OF ASSIGNMENT TYPES

Faculty members teaching AI courses should identify course assignments to measure AI SLOs. These assignments may vary. Five examples of types of assignments (common in undergraduate education) are listed below:

- *Presentation* – a speech or a talk in which a new product, idea, or piece of work is shown and explained to an audience.
- *Paper* – a written work of specified length on a topic, in one of several forms, e.g., research paper, position paper, essay, article, story, poem, script, libretto, etc.
- *Project* – a planned undertaking, usually in the form of a response to a task or problem engaged in by students.
- *Performance/ Production* – a performance/production is a literary (e.g., story, poem, play, libretto, essay, critique) or artistic work (music, dance, drama, visual art, media), presented or exhibited to the public on stage, screen, or in a physical or digital space.
- *Reflection* – a written statement arising from serious thought or consideration given to the examination and/or exploration of how the writer has changed, developed, or grown from experience or interaction with some subject matter, idea, or purpose.

These assignments produce student work, sometimes referred to as artifacts, that faculty assess for grading purposes. While the faculty establish their own criteria for assignment grading, the UF AI (QEP) SLO assessment rubric presents the criteria established by the QEP Task Force Assessment Subcommittee to assess the AI institutional outcomes.

THE FACULTY ROLE IN THE ASSESSMENT OF UF AI ACROSS THE CURRICULUM

Faculty play a primary role in the assessment of the success of UF *AI Across the Curriculum* as an institutional program. This list outlines the faculty role in the assessment process.

- *The number of students to be assessed.* We will select a random sample of 20% of your students to include in the assessment. You will only need to assess these students. You may, however, include other students if you wish.
- *Your existing rubrics remain intact.* The *UF AI Across the Curriculum* assessment does not require you to substitute or replace your existing rubrics. Your rubrics remain exactly as you have developed them. The UF AI SLO Rubric should be applied in addition to your existing rubrics for 20% of your students.

- *Assignment selection.* You will determine a faculty-selected artifact to use for the pilot assessment. The *UF AI Across the Curriculum* Assessment Subcommittee developed a rubric for various types of assignments: papers, presentations, projects, performances/productions, standalone reflections, dissertations, thesis, or any other assignment focusing on main knowledge and skills described in the AI SLOs.
- *Canvas support.* Once you select your assignment(s), you will be assisted by an Instructional Designer (CITT/COIP) to set up in Canvas the AI SLO rubric that best matches your assignment type.
- *The assessment criteria.* Each rubric is based on a four-point scale where three (3) is the Target. A score of four (4) shows performance that exceeds the Target, and scores of two (2) or one (1) are below the Target. The criteria will be entered at the bottom of your existing rubric and assessed at the same time that you grade the assignment (in *Speed Grader*)
- *Ratings.* You will rate the UF AI SLO rubric criteria at one of four levels of achievement described in the rubric. The ratings are not associated with the student's grade.
- *Data collection.* The levels of achievement you assign will load automatically into a different gradebook than the one that collects your grading information. This is the *Learning Management Gradebook*, which the instructional designers will set up for you. Once you have completed the assessment, we will go into Canvas and collect the ratings you have assigned.

CONTACT INFORMATION

For questions about the process or to discuss the validity of a specific measure, please contact:

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UF QEP ASSESSMENT GLOSSARY

AI course categories. Categories based on the four key areas of AI literacies: 1) Knowing and understanding AI, 2) Using and applying AI, 3) Evaluating and creating AI, and 4) AI ethics. These categories form the basis for the UF model for AI course designation.

AI² Center. The Artificial Intelligence Academic Initiative Center, known as AI2 (AI squared), is the UF focal point for academic initiatives related to AI and data science. The center is also a guiding force in the university's re-accreditation process and its five-year Quality Enhancement Plan as it pertains to AI Across the Curriculum (https://ai.ufl.edu/about/ai2-center/)

AI enabled. A fifth AI category identified to capture academic courses that support AI through related knowledge and skill development (e.g., programming, statistics) and/or contain a lower total AI content of one of the four Core AI literacy topics.

AI literacy. First coined as a term in 2015 by Konishi (2015), refers to the knowledge and understanding of AI that is necessary for individuals to participate in the broader discourse around AI and make informed decisions about its use and implications (Laupichler et al., 2022). AI literacy is the ability to understand, use, evaluate, and ethically navigate AI (Long & Megerko, 2020; Laupichler et al., 2022).

Audience. A group for whom a work is developed and/or intended and to whom it is delivered.

Course AI designation process. A process in which proposed AI courses are reviewed and approved by an AI Curriculum Committee. All AI designated courses must address at least one competency and at least one SLO for that literacy.

Direct assessment – Direct assessments of student learning are those that provide for direct examination or observation of student knowledge or skills against measurable performance indicators. Examples of direct assessment include but are not limited to quizzes, tests, inventories, team/group projects,

standardized tests, licensure exams, internships, service-learning projects, case studies, simulations, and portfolios. (https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/Academic-Assessment-Plan-Components.pdf).

Effectiveness. The analysis of multiple data sources to identify strengths, areas for improvement, student success, and outcomes achievement.

Faculty-selected artifact. A sample of student work that the faculty member has chosen as *best evidence* of one or more *AI (QEP) outcomes*.

Holistic rubric. A holistic rubric presents a description of each level of achievement and provides a single score based on an overall impression of a student's performance on a task (Brophy, n.d.).

Paper. A written work of specified length on a topic, in one of several forms, i.e., research paper, essay, article, opinion, etc. (https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/uf-quest-assessment/UF-Quest-1-and-2-Assessment-Faculty-Guide-and-Rubrics-fv.pdf)

Performance/ Production. A literary (e.g., story, poem, play, libretto, essay, critique) or artistic work (music, dance, drama, visual art, media), presented or exhibited to the public on stage, screen, or virtually in a digital space (e.g., podcast, video). (https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/uf-quest-assessment/UF-Quest-1-and-2-Assessment-Faculty-Guide-and-Rubrics-fv.pdf)

Presentation. A speech, talk, or digital communication in which a new product, idea, or piece of work is shown and explained to an audience. (https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/uf-quest-assessment/UF-Quest-1-and-2-Assessment-Faculty-Guide-and-Rubrics-fv.pdf)

Project. A planned undertaking, usually in the form of a response to a task or problem engaged in by students. (https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/uf-quest-assessment/UF-Quest-1-and-2-Assessment-Faculty-Guide-and-Rubrics-fv.pdf)

Reflection. A written statement arising from serious thought or consideration given to the examination and/or exploration of how the writer has changed, developed, or grown from experience or interaction with some subject matter, idea, or purpose. (https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/uf-quest-assessment/UF-Quest-1-and-2-Assessment-Faculty-Guide-and-Rubrics-fv.pdf)

Reliability/Precision. Reliability/precision refers to the general notion of the consistency of the scores across instances of the assessment procedure. (AERA, APA, & NCME, 2014, p. 33).

Rigor. The degree of academic precision and thoroughness required for academic expectations or outcomes to be met successfully. (University of Florida Institutional Assessment, 2019, p. 4).

Rubric. A written guide for assessing student work. At a minimum, it lists the things you are looking for when you assess student work. (Suskie, 2018, p. 190).

Student Learning Outcomes – Expectations for what students should know and be able to do by the time they complete a course. For the AI across the curriculum QEP, these expectations stem from the four AI literacies: 1) Knowing and understanding AI, 2) Using and applying AI, 3) Evaluating and creating AI, and 4) AI ethics.

Validity. Validity refers to the degree to which evidence and theory support the interpretations of assessment results for the proposed uses of the assessments. Validity has to do with the inferences we make based on the results of an assessment and is determined by the evidence we have that can substantiate the claims we make about what our assessment results tell us. (AERA, APA, & NCME, 2014, p. 11)

REFERENCES

American Educational Research Association (AERA), American Psychological Association (APA), & National Council on Measurement in Education (NCME). (2014). *Standards for Educational and Psychological Testing*. Washington, DC: AERA.

Borenstein, J., & Howard, A. (2021). Emerging challenges in AI and the need for AI ethics education. AI Ethics 1, 61–65. https://doi.org/10.1007/s43681-020-00002-7

Brophy, T. S. (n.d.) A practical guide to assessment. Retrieved from https://assessment.aa.ufl.edu/resources-and-information/faculty-resources/a-practical-guide-to-assessment/

Buckingham Shum, S., & Deakin Crick, R. (2016). Learning Analytics for 21st Century Competencies. Journal of Learning Analytics, 3(2), 6-21. https://doi.org/10.18608/jla.2016.32.2

Cantú-Ortiz, F. J., Galeano Sánchez, N., Garrido, L. Terashima-Marin, H., & Brena, R. F. (2020). An artificial intelligence educational strategy for the digital transformation. International Journal on Interactive Design and Manufacturing 14, 1195–1209. https://doi.org/10.1007/s12008-020-00702-8

Dai, Y., Chai, C. S., Lin, P. Y., Jong, M. S. Y., Guo, Y., & Qin, J. (2020). Promoting Students' Well-Being by Developing Their Readiness for the Artificial Intelligence Age. Sustainability, 12(16) 6597. https://doi.org/10.3390/su12166597

Kandlhofer, M., Steinbauer, G., Hirschmugl-Gaisch, S., & Huber, P. (2016). Artificial intelligence and computer science in education: From kindergarten to university. IEEE Frontiers in Education Conference (FIE), 1-9, doi: 10.1109/FIE.2016.7757570

Konishi, Y., & Y. (2015). What is needed for AI literacy? Priorities for the Japanese economy in 2016.

Laupichler, M. C., Aster, A., Schirch, J., & Raupach, T. (2022). Artificial intelligence literacy in higher and adult education: A scoping literature review. Computers and Education: Artificial Intelligence, 3, Article 100101. https://doi.org/10.1016/j.caeai.2022.100101

Long, D., & Megerko, B. (2020). What is AI Literacy? Competencies and Design Considerations. CHI '20: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, 1–16, https://doi.org/10.1145/3313831.3376727

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review, Computers and Education: Artificial Intelligence, 2, Article 100041, https://doi.org/10.1016/j.caeai.2021.100041.

Suskie, L. (2018). Assessing student learning: A common sense guide (3rd ed.). Jossey-Bass/Wiley & Sons: San Francisco, CA

University of Florida. (2022). AI^2 Center. Retrieved from https://ai.ufl.edu/about/ai2-center/

University of Florida Institutional Assessment. (2019). Academic Assessment Plan Components (2019-20 Ed.). Retrieved from https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/Academic-Assessment-Plan-Components.pdf

University of Florida Institutional Assessment. (2019). Developing program goals and student learning outcomes (2019-20 Ed.). Retrieved from https://assessment.aa.ufl.edu/media/assessmentaaufledu/faculty-resources/2019-20-Universityof-Florida-guide-for-developing-program-goals-and-student-learning-outcomes.pdf

University of Florida Institutional Assessment. (2019). UF Quest Assessment Faculty Guide and Rubrics (2019). Retrieved from https://assessment.aa.ufl.edu/media/assessmentaaufledu/academic-assessment/uf-quest-assessment/UF-Quest-1-and-2-Assessment-Faculty-Guide-and-Rubrics-fv.pdf

Zimmerman, M. (2018). *Teaching AI: Exploring New Frontiers for Learning.* Portland, OR: International Society for Technology in Education.

THE UF AI ACROSS THE CURRICULUM QUALITY ENHANCEMENT PLAN ASSESSMENT SUBCOMMITTEE

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APPENDIX F: QEP INDIRECT ASSESSMENT SURVEY

PART 1-ENGAGEMENT WITH UF AI INITIATIVES

Data results from this part of the survey will be utilized to inform actions for improvement in the following areas:

1. Engagement with AI
2. AI Career related activities
3. AI course content

QUESTIONS	RESPONSE TYPE AND OPTIONS					
During this semester, how many times have you done each of the following:	0	1	2	3	4	5+
Participated in AI events (e.g., Annual AI Days, Academic AI Symposium, AI Workshops)						
Participated in AI experiential learning activities (e.g., hackathons, coding competitions, engagement with AI communities.)						
Engaged with potential employers through AI courses (e.g., AI-CISE Career Fair)						
Showcased AI experiences in career fairs (e.g., AI Career Fair)						
Showcased AI experiences in professional events (e.g., AI Days, AI Symposium)						
Interacted with AI software for career preparation, such as resume and/or interview coaching tools (e.g., Quinncia)						
Became aware of AI job opportunities						
Indicate how strongly you agree or disagree with the following items associated with AI courses at UF	Strongly Disagree	Somewhat Disagree	Disagree	Agree	Somewhat Agree	Strongly Agree
AI course descriptions were clear						
AI course content was challenging						
AI course assignments were meaningful for my area of study						

PART 2-AI COURSES, PROGRAMS, AND RESEARCH

Results from this part of the survey should generate baseline data associated with the AI QEP Goals. Data from the first administration should inform specific targets to be included in each goal. This part of the survey is centered on student access to information about AI courses, programs, and research activities.

QUESTIONS	RESPONSE TYPE AND OPTIONS	
During this academic year:	**Yes**	**No**
I was able to take multiple AI courses in my college		
I was able to take one or more AI courses in a college other than mine		
I was able to easily fit an AI course in my schedule		
I was able to locate one or more AI academic programs offered in my college (e.g., certificates, minors)		
I was able to participate in AI undergraduate research programs		
I was able to easily find AI course offerings		
Logic (If Yes): where did you find information about AI courses?	Dropdown menu: college/program website, UF website, AI^2 Center website ai.ufl.edu, newsletter, advisor, faculty, event, OneUF	

PART 3-STUDENT LEARNING OUTCOMES

Results from this part of the survey will serve to inform students' perceptions of their own learning as they complete AI courses and in alignment with the four AI Literacies and respective learning outcomes. Data generated from students' responses will be analyzed in conjunction with direct assessment data to inform actions and/or changes that should promote more effective support of students' learning. The main areas of focus in this part are:

1. Basic functions and use of AI applications
2. Use and application of AI in specific contexts
3. Ethics and AI
4. Evaluating and creating AI

QUESTIONS	RESPONSE TYPE AND OPTIONS					
Indicate how strongly you agree or disagree with the following statements	Strongly Disagree	Somewhat Disagree	Disagree	Agree	Somewhat Agree	Strongly Agree
I am able to explain components, requirements, or characteristics of AI						
I am able to explain the applications of AI in my area of study						
I am able to interact with AI technologies.						
I am able to demonstrate knowledge in AI as a result of the AI courses that I have taken						
I am able to utilize AI tools and techniques that are appropriate for my area of study						
I am able to evaluate the ethical use of AI tools and technologies in various contexts						
I am able to develop some form of tool, hardware, data, or algorithm that could be utilized in AI solutions						
I am able to evaluate the quality of AI tools and applications across various contexts						