



WILLIAM E. KIRWAN CENTER *for* ACADEMIC INNOVATION

Connecting the Dots: Aligning College Experiences with Career-Ready Skills

The USM Digital Badging Initiative

Spring 2018

Context

During this time of disruptive change in higher education, public colleges and universities are being challenged to demonstrate the value of their degrees and credentials, and to produce evidence of return on investment amid budget constraints and the changing student population. Through the Kirwan Center for Academic Innovation, the University System of Maryland (USM) is building system-wide capacity to create effective, efficient learning environments that enhance student success. As the first system-level center to conceptualize, promote, study, and disseminate groundbreaking academic innovations, the Kirwan Center is discovering what works and developing strategies aimed at scaling and sustaining student success and transforming higher education.

As part of a broad academic transformation platform, the Kirwan Center is addressing a critical issue related to the value of higher education: employer perceptions that college graduates lack career-ready skills needed for workplace success. Surveys consistently reveal employer concern that college graduates lack career-ready skills such as collaboration, communication, and problem solving. While this is likely true for some, it is also likely that many more college graduates actually *do* possess the requisite career-ready skills but struggle to translate their curricular and co-curricular experiences into the specific competencies sought by employers.

In response, USM institutions have been working together since 2015 to design, develop, and explore the feasibility of digital badging. As an innovative way to validate and better communicate graduates' career-ready skills to employers, the USM Digital Badging Initiative (USM-DBI) focuses on **Collaboration, Communication, Critical Thinking, Globalism, Interculturalism, Leadership, Problem Solving, and Professionalism**. While all USM institutions are eligible to participate, to date the most active institutions have been Bowie State University, Coppin State University; Frostburg State University; Salisbury University; Towson University; University of Maryland, Baltimore County; the Universities at Shady Grove; University of Baltimore; and University of Maryland University College.

The transitions that students make from education to employment can be fraught with uncertainty, poor communication, and inefficiencies. Students have difficulty articulating their knowledge, skills, and abilities in their resumes and online profiles, and their evidence of learning from academic activities often does not “translate” into employment processes. Employers often do not understand what is included in credentials; they then make assumptions about what certain credentials mean, and what graduates should know and be able to do. Improved communication about the competencies that are included in credentials can help to address these problems for students, academic institutions, and employers.

- ACE, Communicating the Value of Competencies (2016)

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Badges “make visible and validate learning in both formal and informal settings, and hold the potential to help transform where and how learning is valued” ([MacArthur Foundation, n.d.](#)). And, because they are digital, badges include access to publicly viewable artifacts that not only validate learning, but also provide evidence of that learning, thus allowing employers more insight into what the badge earner did to achieve that badge. Additionally, being digital and openly accessible means these badges can be shared through digital portfolios and social and professional networks such as Facebook and LinkedIn.

As a complement to traditional credentials, badges have the potential to 1) motivate students to pursue opportunities that will help them become “career-ready,” 2) help students translate their experiences into the higher-order skills employers seek, and 3) differentiate students in a competitive marketplace.

The USM-DBI is being led by Kirwan Center staff along with a working group comprised of faculty, student affairs professionals, and administrators from across the participating institutions. Working together enables the group to:

- Identify common challenges faced by institutions in providing a quality education that will prepare students for careers and life-long learning;
- Develop an array of models for integrating curricular and co-curricular learning opportunities into badge earning pathways that focus explicitly on the development of career-ready skills;
- Better leverage relationships with regional employers and national leaders in the field to inform and support taking this effort to scale.

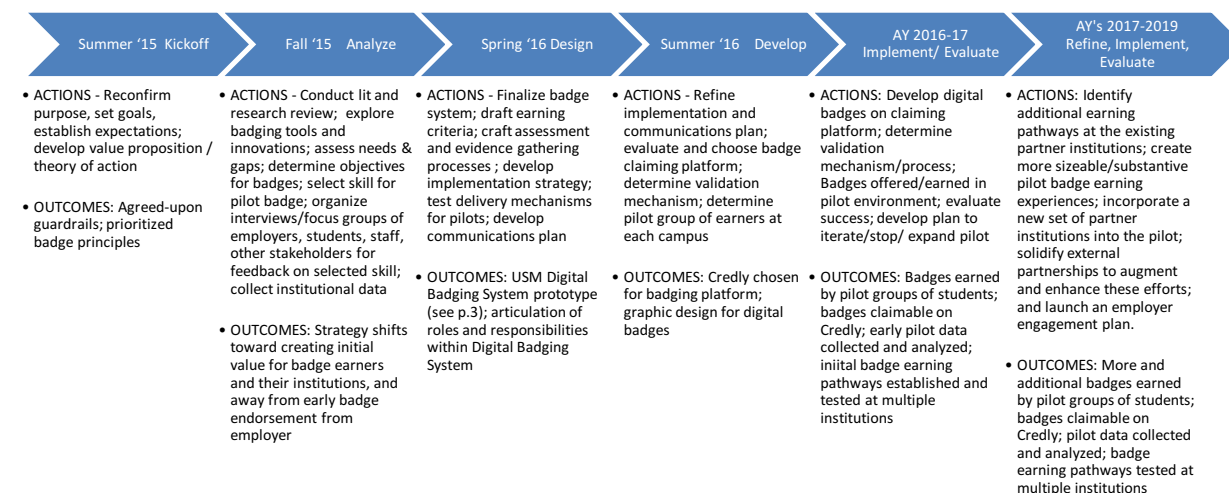
Today’s badges are digital credentials that represent skills, interests, and achievements earned by an individual through specific projects, programs, courses, or other activities. There is a learning ecosystem behind the badges that make them powerful and connected credentials.

-Alliance for Excellent Education (2013), Expanding Education and Workforce Opportunities through Digital Badges

Design Process and Timeline

At the outset of the initiative, the working group employed the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) instructional design model to inform the process. The phases and timeline are illustrated in Figure 1 and described in more detail below.

FIGURE 1. BADGE DESIGN PROCESS AND TIMELINE



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Summer 2015: Kickoff

During the kickoff phase of the USM-DBI, the working group met to confirm the purpose of the initiative, set goals, establish expectations and working assumptions, and develop the value proposition and a theory of action. This phase concluded with a set of agreed-upon “guardrails” for the work and a weighted set of principles around the purpose of a badge system (see *Appendix A*).

Fall 2015: Analyze

During the Fall semester of 2015, the working group gathered and analyzed data to identify the gaps in career-readiness skills for USM graduates as well as the benefits and costs of digital badging tools and innovations. The group also conducted literature and research reviews (see *Appendix B*); examined career-readiness standards and other digital badging initiatives; and conducted interviews, surveys, and focus groups of employers, students, staff, other stakeholders to get feedback on the USM-DBI’s design and goals.

The working group also consulted with Dr. Daniel T. Hickey, Professor of Learning Sciences at Indiana University Bloomington. Dr. Hickey is an expert on the evolving field of digital badging and the author of a MacArthur Foundation-sponsored research study examining factors that impact the effectiveness of digital badges.

Another key activity during this phase was the survey of regional employers. The working group surveyed 138 regional employers in October-November 2015 with a 22.4% response rate. Respondents represented a range of industries including Government/Non-Profit (17.95%); Technology Services (15.38%); Finance and Insurance (15.38%); and Health Care and Social Services (12.82%). Respondents generally held the title of Talent Acquisition Manager, Recruiter, or HR Manager, and 51% of respondents had been in their roles 3 years or less. High-level findings from the survey included:

- The top career-ready skills identified by respondents were communication, critical thinking/analytic reasoning, initiative, leadership/decision-making, and strong work ethic.
- The majority of the respondents had not heard of digital badging prior to receiving the survey.
- Employers did not see much value in a digital badge certifying the top-rated career-ready skill they identified.
- The respondents believed there was little value-add for a badge as compared to their current means of collecting data on potential hires.
- Respondents were unsure if digital badges could easily fit into their current candidate evaluation processes.
- Respondents indicated there may be some value in having the badge endorsed by the USM.
- Respondents indicated there may be value in having the badge endorsed by another party.
- There was some interest among the respondents in providing or attending special recruitment opportunities for badge earners, but many were on the fence.

The survey findings caused the working group to shift focus from having badges endorsed by employers before they were created to creating initial value for the badge earners and their institutions by basing the badges on those skills most frequently requested by employers.

Spring 2016: Design

In the third phase of the USM-DBI, the working group synthesized the collected data and information and used it to inform the creation of the USM Digital Badging System. The graphic in *Appendix C* illustrates the key components of the badge system: 1) the **badge earning pathway** established by the

institution, which may include co-curricular programs, coursework, community-based experiences, and/or assessment of prior learning and experience; 2) the **research-based criteria**, established by the institution, against which a student’s demonstration of learning will be assessed; 3) the **badge dimensions**, shared and standardized across the USM, describing the specific skill components that an earner must possess to earn the badge; and 4) the **badges** themselves, which validate the earner has demonstrated the associated skills at a certain level of proficiency. The long-term vision is to offer a meta-badge from the USM—the Launch Badge—for students who have earned all the individual career-ready badges. The Launch Badge will signify to employers and other important audiences that earners have honed their ability to articulate and activate a range of career-ready skills vis-à-vis the positions and/or careers they seek.

Summer 2016: Develop

Over the summer 2016, the working group began to draft a minimum set of quality assurance hallmarks to ensure consistency among badges issued by different institutions, such that earners of any badge within the USM system would:

- Demonstrate proficiency in all the dimensions of a given badge as established through the USM Digital Badging initiative,
- Practice the badged skill in at least two contexts,
- Reflect on the badged skill,
- Produce at least two distinct pieces of evidence that they possess the badged skill, and
- Be assessed in at least two ways (formative assessment by self/peers, summative assessment by experts).¹

The development phase also included the articulation of an initial set of dimensions for each badge, which describe the skill components that earners must demonstrate to earn the badge (see *Appendix D*). Each institution in the USM-DBI will use these shared dimensions to develop rubrics to assess students’ proficiency as it relates to the badge competency. The earning pathways will be backwards mapped from these dimensions to ensure that the badge-earning pathway on campus provides opportunities for students to gain and demonstrate the articulated knowledge/skills/abilities. Additionally, the working group clarified the roles and responsibilities for USM-DBI partners (see *Appendix E*).

Fall 2016/Spring 2017: Implement and Evaluate

In 2016-17, the participating institutions piloted badges with small, targeted groups of students. Working group representatives from each institution, often with colleagues from their home institutions, selected a skill area, identified existing learning opportunities (curricular or co-curricular) where students could undergo an early pilot “badge earning” experience, and drafted or refined artifact-based assignments and assessments aligned to the USM Digital Badging dimensions for their chosen badge for these existing learning opportunities.

Deliverables from this phase include 1) a finalized set of vetted and agreed-upon badge dimensions that delineate the learning outcomes associated with the NACE career-ready skills, 2) a vetted set of badge earning quality assurance “hallmarks” that identify the minimum required expectations for badge earning experiences (see *Appendix F*), and 3) early pilot implementation findings and lessons learned, which are currently being gathered and incorporated into the next phase of the pilot.

¹ See Appendix F for the current version of the hallmarks.

Fall 2017 – Fall 2019: Refine, Implement, and Evaluate

The next phase of the pilot is now underway, and will focus on five areas:

- Identifying additional earning pathways within the existing partner institutions (for example, by moving more fully into the curriculum);
- Creating more sizeable/substantive pilot badge earning experiences among the existing institutional partners;
- Incorporating a new set of partner institutions into the pilot;
- Solidifying external partnerships to augment and enhance these efforts; and
- Launching an employer engagement plan.

The badge validation and claim process will continue to provide a mechanism for institutional staff and faculty to validate that earners have in fact demonstrated the requisite competencies and included the appropriate evidence when badges are claimed and before they are publicly shared. The working group is working with Credly to provide a centralized platform for validating and claiming the badges (see <https://usm.credly.com/#!/enterprise>). Via Credly, students can claim and then share their badges online through the web and social media.

Deliverables from this next implementation and evaluation phase will include an administrator's guide, a published set of meta-rubrics for each badge, and an evaluation of the overall badging pilot, including a survey of students' experience in the badging initiative at their home institution.

Next Steps

The Kirwan Center is exploring the philanthropic community's interest in supporting the USM-DBI. During the 2017-2019 phase, the aim is to 1) continue piloting and refining the constellation of career-ready badges as a proof of concept, 2) work more closely with regional and national employers to help them understand the USM badges and their value in the recruitment process, 3) find ways to embed badge earning opportunities in the curriculum (such as general education); and 4) explore ways to take the initiative to scale across the USM. The USM-DBI working group believes badges will complement traditional credentials by providing a better way for students to communicate to employers what they know and are able to do. In turn, badges will help employers make better hiring decisions by improving fit and match between students and jobs. With support from the philanthropic community, the Kirwan Center believes the USM-DBI will foster a career-relevant system that benefits both students and employers and is scalable ultimately to higher education institutions nationwide.

About the Kirwan Center for Academic Innovation

Established in 2013, the Kirwan Center explores—through rigorous quantitative and qualitative research—the interplay between approaches proven to improve student success and the feasibility of implementing those approaches in context. Developed at a system level, the Kirwan Center capitalizes on the USM's position as a microcosm of public higher education and brings real value to the work and the national discussion around academic transformation. The Kirwan Center's research-to-practice perspective provides not only evidence-based models for improving student success, but also proven strategies for how these approaches might be scaled and sustained in a variety of contexts both within Maryland and across higher education nationally.

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APPENDIX A: INITIAL GUARDRAILS AND BADGING PRINCIPLES

Initial Guardrails

- The working group agrees to share information, insights, resources across institutions throughout this initiative.
- The badges created as part of the initiative will be open to all USM institutions and the working group will aim to have the USM badges be as open as possible for others as well (although the degree of “openness” may change over the course of the initiative).
- The badge will address a career ready skill, defined as communicating what students should know and be able to do to be “career ready.”
- Badges will be created in collaboration with employers.
- Any skill selected will be validated as valued by employers for use in the hiring process.
- Badges may be scaffolded or include a progression of skill development.
- Evidence for earning badges will largely come from co-curricular experiences, and may also come from curricular experiences.

Badging Principles

Principles	Definition	Weight
High employer relevancy and value	Meets a need in the employer recruiting and selection process. Helps differentiate candidates, improves the match and fit.	4
Evidence easily communicated	Evidence of completion can be made clear and flexible, specific.	4
Easily measured / Low admin hassle to validate / issue	Easily validated; does not require extensive assessment / person-hours to measure and determine success.	4
High student value and achievable	Allows students to develop and demonstrate skills not easily documented by curriculum. Clearly achievable/accessible to all kinds of students.	3
Applicable to all disciplines	Any student, regardless of program or major, is able to pursue.	3
Alignment to established standards	To the extent that standards exist for skill, badge criteria are aligned.	3
Can be demonstrated primarily through co-curricular experiences	Complements curricular work; does not replicate or replace curricular experiences.	3
Cannot be earned for participation alone	Must include measurement of competency.	3
“Evergreen”	Does not “fade,” become obsolete; remains valid in the long term.	2
Evidence should be built over period of time	Not a one-off experience; must require time to develop, both breadth and depth.	2
Alignment to institutional mission	Aligned to priorities of institutions.	2
Inter-disciplinary	Requires exposure to variety of perspectives.	1

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APPENDIX B: RESEARCH AND RESOURCES INFORMING THE WORK

Career-Ready Skills

[Career Readiness Defined: NACE defines career readiness, identifies key competencies](#)
[ACE: Communicating the Value of Competencies](#)
[ACE: Quality Dimensions for Connected Credentials:](#)
[P21 - Framework for 21st Century Learning:](#)
[AAC&U - Essential Learning Outcomes](#)
[EDC - Work Ready Now](#)
[Institute for the Future : Future Work Skills 2020](#)
[Common Employability Skills](#)
[Connecting Credentials Framework](#)
[Community Colleges and 21st Century Skills: Skills Panels to Assist Student Career Success](#)
[Credential Transparency Initiative](#)
[A Framework for Extending the Transcript](#)
[America's colleges are getting a bad rap on the skills gap](#)
[Preparing Students for the Workforce: Six co-curricular opportunities for experiential learning](#)

Digital Badging

[Six Steps to Building High-Quality Open Digital Badges](#)
[EDUCAUSE: 7 Things You Should Know about... Badges](#)
[Where Badges Work Better](#)
[We Don't Need No Stinking Badges... Or Do We?](#)
[Evidence of Learning: Understanding the Supplier Ecosystem](#)
[Open Badges in Higher Education](#)
[Open Badges for Higher Education](#)
[How Badges Really Work in Higher Education](#)
[IMS Global: Enabling Better Digital Credentialing](#)

Digital Badging Examples in Higher Ed

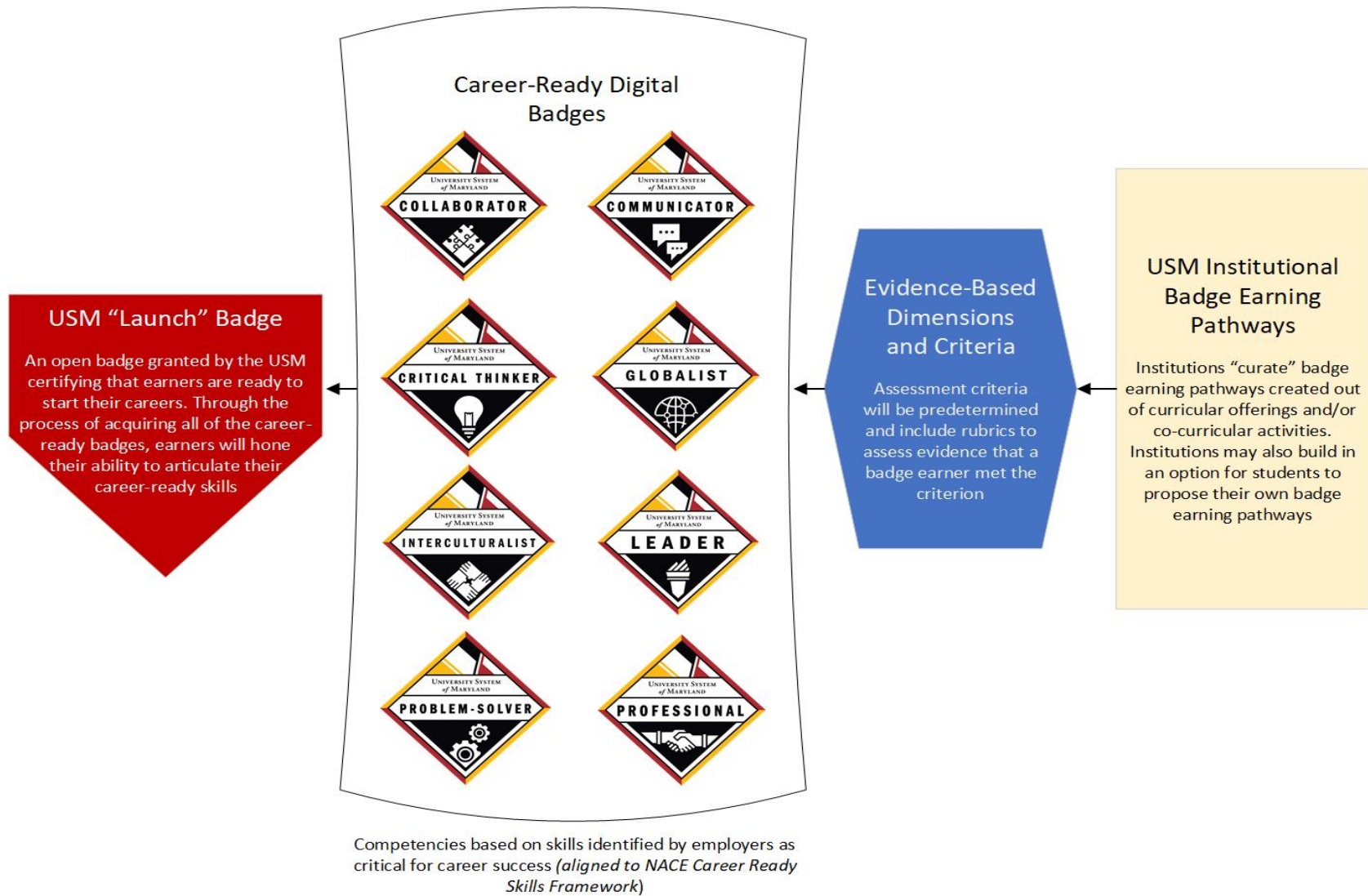
[Purdue Passport](#)
[Penn State](#)
[Arizona State University](#)
[University of Michigan M-BLEM](#)
[Seton Hall University](#)
[Notre Dame](#)
[Foundation for California Community Colleges](#)
[Deakin University](#)
[Brandman University](#)
[OPEN SUNY](#)
[LaGuardia Community College](#)
[Colorado State University](#)
[Beuth University](#)
[Georgia Southern University](#)

Badging & Career Readiness

[Digital Badging Pilot Based on Career Readiness Competencies](#)
[What Employers Think of Badges, Nanodegrees from Online Programs](#)
[Employer Perceptions of Critical Information Literacy Skills and Digital Badges](#)
[Digital Badges Certify Competencies Gained through Student Clubs](#)

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APPENDIX C: USM DIGITAL BADGE SYSTEM



APPENDIX D: USM BADGE DIMENSIONS

Name	Description	Dimensions
The Collaborator	The COLLABORATOR BADGE validates that the earner has demonstrated the skills necessary to be a successful and contributing member of a professional team.	The Collaborator advances the work of a team by effectively: <ul style="list-style-type: none">• Articulating one’s own role on the team and the roles of others.• Integrating team members’ diverse viewpoints.• Motivating and supporting others on the team.• Building upon or synthesizing the contributions of others.• Offering ideas, suggestions, alternative solutions, and feedback.• Accounting for one’s own assigned role and responsibilities on the team.• Negotiating, managing, and resolving conflicts when they arise.
The Communicator	The COMMUNICATOR BADGE validates that the earner has demonstrated ability to articulate thoughts and ideas clearly and effectively in written and/or oral forms.	The Communicator expresses thoughts and ideas by effectively: <ul style="list-style-type: none">• Using syntax, grammar, and/or vocabulary appropriate to the context and modality.• Ensuring messages are organized, clear, and consistent with any supporting material.• Tailoring the message and delivery method to the topic, audience, purpose, and context.• Reflecting on one’s own messages and adjusting as appropriate.• Critically analyzing others’ messages.• Engaging diverse and competing perspectives and the ways they influence communication.
The Critical Thinker	The CRITICAL THINKER BADGE validates that the earner has demonstrated the ability to analyze and evaluate thinking and commit to constant improvement.	The Critical Thinker excels in the art of analyzing and evaluating thinking with a view to improving it by effectively: <ul style="list-style-type: none">• Raising vital questions and problems, formulating them clearly and precisely.• Gathering and assessing relevant information, using abstract ideas to interpret it effectively.• Coming to well-reasoned conclusions and solutions, testing them against relevant criteria and standards.• Thinking open-mindedly within alternative systems of thought.• Recognizing and assessing, as need be, one’s own assumptions, implications, and practical consequences.• Communicating effectively with others in figuring out solutions to complex problems.

Name	Description	Dimensions
The Globalist	The GLOBALIST BADGE validates that the earner understands international issues, learns from and works with people from diverse linguistic and cultural backgrounds, and possesses skills to function productively in an interdependent world community. The individual demonstrates critical analysis of and engagement with global systems, including natural, physical, social, cultural, economic, and political systems.	<p>The Globalist demonstrates global awareness by effectively:</p> <ul style="list-style-type: none"> • Recognizing differences across and within world cultures and the diverse viewpoints that emerge from these differences. • Identifying developments and trends associated with historical or contemporary global issues. • Developing a sense of personal and civic responsibility with respect to global issues. • Applying communication skills and strategies, including the ability to use another language, to interact effectively with people from other cultures. • Analyzing the power structures, complexities and interdependencies of global systems. • Evaluating solutions to global challenges using interdisciplinary perspectives.
The Interculturalist	The INTERCULTURALIST BADGE validates that the earner values, respects, and learns from diverse cultures, races, ages, genders, sexual orientations, and religions. The individual demonstrates openness, inclusiveness, sensitivity, and the ability to interact respectfully with all people and understand individuals' differences.	<p>The Interculturalist navigates cultural boundaries by effectively:</p> <ul style="list-style-type: none"> • Identifying one's cultural norms and values. • Articulating how one's experience shapes cultural norms and values and how culture shapes personal experience. • Analyzing how cultural norms and values affect one's interactions with others. • Recognizing the commonalities and differences that exist among people and cultures and how these factors influence one's relationships with others. • Understanding the influence of history, geography, religion, gender, race, ethnicity, and other factors on one's identity and the identities of others. • Questioning explicit and implicit forms of power, privilege, inequality, and inequity. • Engaging with people and ideas from other cultures with courage, sensitivity, openness, and curiosity.
The Leader	The LEADER BADGE validates that the earner has demonstrated the ability to leverage the strengths of others to achieve common goals, and use interpersonal skills to coach and develop others. The individual can assess and manage self and others; use empathetic skills to guide and motivate; and organize, prioritize, and delegate work.	<p>The Leader leverages the strengths of others to achieve common goals by effectively:</p> <ul style="list-style-type: none"> • Assessing individual and collective strengths, weaknesses, and capacities to achieve the desired goal. • Engaging diverse or competing perspectives. • Motivating others. • Articulating a vision and strategy. • Organizing, prioritizing, and delegating work, roles, and responsibilities. • Reflecting on how one's leadership affects process and outcomes and adjusting as appropriate. • Reviewing outcomes and assessing implications for future plans.

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Name	Description	Dimensions
The Problem Solver	The PROBLEM SOLVER BADGE validates that the earner has demonstrated the skills necessary to resolve complex problems/challenges through exercising sound reasoning to analyze issues, make decisions, and overcome challenges. The individual can obtain, interpret, and use knowledge, facts, and data in this process, and may demonstrate originality and inventiveness.	The Problem Solver tackles challenges alone or in teams by effectively: <ul style="list-style-type: none"> • Articulating the problem. • Identifying the desired end result. • Brainstorming creative options for achieving the desired end result. • Analyzing and selecting the option that best achieves the desired end result. • Developing a plan of action that will achieve the desired end result. • Enacting the plan of action and adapting as needed. • Evaluating the outcomes in relationship to the desired goals.
The Professional	The PROFESSIONAL BADGE validates that the earner has demonstrated personal accountability, effective work habits, integrity, personal accountability and commitment.	The Professional strives for excellence by effectively: <ul style="list-style-type: none"> • Taking responsibility for one’s actions and outcomes. • Examining the implications of one’s own behavior and decisions. • Acknowledging mistakes and learning from them. • Following through on commitments. • Persevering in the face of challenges and changes. • Acting with the interest of the larger community in mind. • Evaluating one’s own performance over time and adjusting.

APPENDIX E: ROLES AND RESPONSIBILITIES OF ISSUERS AND ENDORSER

Badge Issuers (The Institutional Partners) in the USM System of Badges will:

- Define what experiences on or off campus will provide eligible evidence for earning a badge
- Define what evidence earners will need to present
- Ensure their badge earning pathway provides a mechanism for students to gain the knowledge and skills articulated in the USM badge dimensions
- Gather the evidence of students' demonstration of the competency
- Use a rubric to determine if students have met minimal levels of proficiency to earn the badge
- Issue the badges
- Use the results from badge earners and other data to strengthen program effectiveness

The Badge Endorser (The USM-DBI Working Group) will:

- Articulate the dimensions of each badge skill area
- Articulate the quality assurance hallmarks for badges within the USM badging system
- Validate the integrity of badges across institutions (i.e. validate that a leadership badge offered by Towson is as meaningful as a leadership badge offered by Frostburg)
- Maintain the enterprise site for USM-DBI
- Ensure the claiming process aligns to requirements of FERPA and other student privacy laws
- Develop a consistent graphic design for the system of badges
- Support ongoing cross-institutional collaboration and information-sharing
- Draw on lessons learned from across the institutions to spur larger-scale improvement, growth, and sustainability of this effort

APPENDIX F: USM DIGITAL BADGING QUALITY ASSURANCE HALLMARKS

Participating institutions will:

- Identify and link a set of activities into a badge earning pathway.
 - The badge earning pathway should incorporate all the USM Badge dimensions comprising a career ready skill.
 - The badge earning pathway should explicitly promote the transfer of skill across different activities, to help prepare students to transfer their skills into the workplace upon graduation.
 - The badge earning pathway could link existing curricular, co-curricular, and/or community-based experiences.
 - The badge earning pathway would ideally allow students to demonstrate a progression of skills over time (vertical scaffolding)
- Curate/refine activities/assignments for students to demonstrate acquisition of each of the badge dimensions.
 - The activities/assignments should result in students producing at least two distinct artifacts reflecting a demonstration of skills.
 - At least one artifact should ask students to reflect on how their experiences contributed to the badged skill and how they might continue to refine their skills going forward.
- Develop/refine a rubric reflecting the badge dimensions for use in assessing student artifacts.
 - Institutional teams should establish an agreed-upon level of proficiency that students must reach to earn a badge.
 - All badge dimensions should have the same level of proficiency attached to them (for example, if a score of “3” is the agreed-upon level of proficiency, then students should achieve a “3” in all the badge dimensions to earn a badge).
 - Rubrics should meet the following criteria:
 - 4-point scale --> emerging, developing, proficient, advanced
 - Performance-based with a developmental continuum
 - Indicators are qualitative not quantitative (not frequency-based)
- Assess students’ artifacts in at least two ways.
 - Formative assessment may involve self- assessment, peer-assessment, or expert assessment.
 - Summative assessment should be conducted by experts, as determined by the institution.
- Communicate clearly to students about the purpose of the badge, the pathway(s) they may follow to earn the badge, how they will be assessed, and what qualifies them to earn a badge.
- Develop marketing materials to attract students. Marketing materials should acknowledge USM as follows: *“This badge program is part of the University System of Maryland Digital Badging Initiative, organized by the Kirwan Center for Academic Innovation.”*
- Issue badges to all students who have met the agreed-upon proficiency levels in the summative assessment.
- Build an institutional Credly site that links to the USM Enterprise Credly site to issue badges earned throughout the pilot.
- Collect student perception data on the badge earning experience via a USM-developed survey as well as a sample of de-identified/anonymized student artifacts for sharing with the working group.
- Meet as a team as needed to move institutional efforts forward and to use collected assessment results to strengthen program effectiveness.