Recommendation for the Implementation of Digital Badging Credentials at Michigan Tech

Prepared by the Provost's Digital Badging Committee

March 31, 2020

Submitted by the Provost's Committee on Digital Badging

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Introduction/Background

Digital badges are a type of digital credential that are housed in an online system that allows for portability and display of specific achievements or competencies to interested parties such as potential and current employers, educational institutions and their faculty and staff or to other learners. The power of these digital credentials lies in the fact that they include the definitions and assertions of the learning objectives that a learner has been assessed to be proficient in by the issuing agency. It should be noted that badges can, for the most part, be divided into competency based (the learner has been assessed to have gained certain skills outlined by the instructor or curriculum developer) or achievement based (the only assertion by the issuing agency is that the badge recipient has completed a task). There is not currently a standards agency that is responsible for regulating how digital badges are implemented, however, the Open Badges v2.0 standard is a data specification for required and optional data elements that are to be included as part of a compliant digital badge which ensures interoperability across organizations for the sharing of these credentials. This move toward standardizing badges has removed a variety of technological hurdles that previously made implementing badges an onerous prospect for an institution. There are currently over 20 badging platforms that are Open Badges v2.0 certified by the IMS Global Learning Consortium.

The current landscape of digital badge issuers is broad in regards to the range of effort required to earn a specific badge. For example, GVSU issues badges as part of its computer science master's degree program that represent up to 15 credits worth of effort at the graduate level, ostensibly these replace certificates or minors at the graduate level. On the other hand, GVSU also offers faculty badges for professional development that can represent attending a workshop, and by policy their credit-based badges can be as small as 0.5 credits. Additionally, some institutions and organizations implement badges as an engagement tool, even "gamifying" badge attainment, such as bucket lists, or "leveling up". For example, the American Association of School Librarians offered badges for tasks like registering for the annual conference and sharing on social media. This lack of standards and wide range of effort is a concern as both can potentially undermine the value of a badge and thus limit participation in the program.

Committee

A small committee of faculty and staff was charged by Michigan Tech's provost to meet and make a recommendation on how Michigan Tech can implement these digital credentials in a meaningful way that continues to promote the university's brand and rigorous education (see Appendix A). Discussions focused around value, effort involved to earn a badge, audience identification, subject matter, cost and fee structure. For the purposes of this document and recommendations only competency-based badges were considered. The committee recommends that in the interest of maintaining the credibility of Michigan Tech,

achievement-based badges not be issued since other mechanisms exist for this type of a credential. All of the following recommendations are based on this assumption.

I. Badging Ecosystem

The committee believes that badges at Michigan Tech should represent a subset of the type of education that we currently offer and that we should not impinge on the inherent value of these credentials by utilizing them as achievement identifiers, but rather assessed competencies that have value to the institutions that hire our graduates.

While eventually offering badges targeted at a variety of audiences/levels is considered appropriate to Michigan Tech's mission and goals, the committee suggests that piloting two specific software competency badges will be the fastest way to get started with digital badging at Michigan Tech and better assess their value as an academic credential. The audience for these pilot badges are current Michigan Tech students who may want to demonstrate proficiency in an industry valued skill . The curricula for each of these badges represent approximately one half of a credit worth of effort (approximately 20 hours), however, the committee does not recommend using badges as a fractional credit system to start with.

II. Marketing

A standardized visual identity will be developed with the assistance of UMC and will be maintained as part of a badge proposal process. Non-campus market segments will be explored after the initial pilot programs that are planned for summer and academic year 2020-21 (see Timeline).

III. Implementation Plan and Timeline

Technical Implementation

Capitalizing on the resources that are currently available to Michigan Tech and the integration with Canvas, the badging platform, "Badgr" is the most viable technology platform solution for piloting Michigan Tech digital badge credentials. This follows widely published best practices in that badges will not be "stand alone", we will have the ability to issue badges automatically and the platform conforms to the Open Badges v2.0. The Committee believes that Badgr will be the most expeditious choice of all other available badging platforms. Upon the acceptance of this committee's recommendations, technical implementation of this badging platform can begin immediately, and can be ready to provide support for the curriculum outlined in the pilot projects.

William G. Jackson Center for Teaching and Learning staff are well positioned to not only implement the technology within our learning management system, but to develop any documentation, training materials and provide ongoing technical support.

Graphic design should also commence on the acceptance of these recommendations to conclude in time to support the issuance of the first pilot badges by end of summer semester 2020.

Responsible Parties

Badges should only be developed following a vetted badge proposal process. This process, as imagined by the committee, could be modeled after the current course proposal process, in that a proposal form is submitted for review and approval by a committee or central office. Badge proposal review should be the purview of the registrar and their designees, possibly a committee consisting of faculty and other pertinent staff. A sample proposal outline is included as Appendix B It is the intention of this committee to present this process to the senate and seek approval to continue with badge creation as an informal, informative process rather than overburden the senate with approving each badge proposal, especially as badges would exist outside of the typical academic credit and transcript systems.

Fee Structure

It is important the badges backed by Michigan Tech meet certain standards for rigor and quality, so there will be an investment of labor in the development, delivery, and evaluation of programs designated as leading to badges, in addition to any direct costs there might be in support of the badging program. The committee agreed that even for programs with no material costs, a nominal fee is warranted to encourage commitment and completion. The two programs selected for piloting which are described below, tend to have high initial enrollment but overall low completion rates. At this time it is suggested that the development of a consistent fee structure for badges be considered after the pilot phase and development of badges for other audiences (e.g. industry professionals, continuing education, or K-12).

Timeline

Summer 2020: Pilot Programs

The committee identified two existing programs that are suitable to use as pilot badge programs. They have already been developed and are already being used to provide specific competencies to graduate students. First badges for these courses will be offered Fall 2020.

Essentials of Free and Open Source Software - Gowtham (Appendix C)

GT Power Engine Simulation - Craig Friedrich (Appendix D)

Academic Year 2020-2021:

After the pilot project has been implemented, the committee discussed follow-on curricula for badging projects that may benefit from lessons learned from this pilot that could be implemented shortly thereafter.

A. Badging to represent Michigan Tech's "co-curricular" courses
B. "Soft skills" curriculum development
C. Internal training (think safe place training)
D. Information literacy (partner with librarians for curriculum development)
    a. Specific discussions have indicated an interest in and campus need for developing an "Introduction to R" Badge

...and Beyond:

The committee identified several larger scale questions that are being intentionally left open at this point (Appendix E). It will be easier to address these after experience has been gained through the proposed pilot programs and development of some of the near term options that have been identified.

A longer term consideration could be focused around pre-college outreach and how badges can be incorporated to bolster this crucial recruiting tool. One of the key engagement programs that is currently in place is Michigan Tech's summer youth programs. Curricula that is currently offered could be identified as "badgeable". The value to the K-12 learner could be realized by some sort of prioritization if they decide to attend Michigan Tech such as early class registration, early selection of housing·, waive a prerequisite class(es). Building on that, Michigan Tech could brand asynchronous, web-based modules that could be administered by K-12 teachers as part of their class and curricula at remote school locations. This model could offer a unique opportunity that has developmental value for both learners and teachers. Similarly, badges issued to learners could be used as an incentive to apply or attend Michigan Tech, and in both cases creates a unique branding and marketing opportunity for the university. These could also offer opportunities for continuous contact with prospective students.

Resources/Models

Badges for co-curriculars

- University of Michigan is piloting badges for this purpose

Badges for “soft skills”

- 21st Century Skills Badge Toolkit
- Amarillo College’s Management program has a set of badges focused on “soft skills”

Badges for University Professional Development

- GVSU and Kent State have different levels of Faculty Badges for professional development, representing (at the lowest level) participation in workshops though (at the high end) application and sharing with peers.
- UNC has Digital Advancement Badges are for students to specialize in three different digital specialties (pedagogy, project management, or data studies)

Badges for Information Literacy

- PennState University Libraries has badges that stack, i.e. earning several introductory badges will unlock a “meta badge” and earning all meta badges unlocks the “über badge”

Badge models using levels (i.e., badges that combine into mastery badges)

- Colorado State University has Trek, Quest, and Mastery Badges. In badges with all three levels, purchasing can happen at the individual Trek level or for a discount, at the Quest or Mastery Badge levels.

Badges as prep for certification/licensure

- Creighton University’s drone aviation badge prepares earners for the FAA exam

Appendix A

Committee Charge

Michigan Tech

Office Memo

Office of the Provost and
Senior Vice President for Academic Affairs

Phone: (906) 487-2440
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TO: Tim Colling, Director, CTT
Craig Friedrich, Professor & Robbins Chair, ME-EM
Gowtham Shankara, Director of Research Computing, IT

FROM: Jacqueline E. Huntoon, Provost & Senior Vice President for Academic Affairs

COPY: Chad Arney, Director of Strategic Initatives, CTL
Alexandria Guth, Director of Academic Accreditation & Compliance, Provost's Office
Karen Hext, Degree Audit Coordinator, Registrar's Office

DATE: February 14, 2020

SUBJECT: Digital Badging

Background
In an effort to effectively track learners who complete units of education or professional development offered by Michigan Tech that do not result in academic credit, this committee will be convened to address the issues surrounding implementing digital badging at Michigan Tech as a method to offer alternative credentials that are not traditionally included on the university's transcripts. Digital badges provide a portable method for learners to demonstrate acquired skills that are directly related to learning outcomes and competencies that employers will be able to directly equate to their business models and workforce needs.

The following outlines the opportunities and specific charge to this committee in regards to solutions to present in a final proposal to the provost by March 31, 2020.

Committee Charge
I respectfully request that the following issues be explored, and recommendations to implement digital badging at Michigan Tech are developed.

1. Define a badging ecosystem addressing the following.
    a. Can badges stand alone, or must they be part of a stackable set or sequence?
    b. Is it appropriate to award badges attained as part of a larger curriculum (e.g., badges awarded for specific learning objectives within a course)?
    c. Are badges appropriate for use at different academic levels (i.e., undergraduate, graduate, continuing education / professional development)?
    d. What effort on the learner's part can result in a badge (i.e., what is the effort required to complete a badge relative to the effort required to achieve a transcriptable academic credit)?
2. Identify the marketing efforts surrounding these micro-credentials:
    a. visual identity,
    b. naming, and
    c. key market segments (i.e., precollege, undergraduate students, graduate students, adult/professional learners).
3. Propose an implementation plan and timeline, including a pilot badge or set of badges to be implemented before the end of summer semester that specifically addresses:
    a. Identification of a badging platform suitable for Michigan Tech.

b. Identification of a department or unit responsible for maintaining the integrity of Michigan Tech badges including review and approval of proposed badges and defining a proposal process.
c. A potential fee structure to provide revenue to the responsible unit such that the unit can eventually become self-supporting and can provide investments to grow activities.

Reporting Structure
Reports to: Provost and Senior Vice President for Academic Affairs
Chaired by: Director, Strategic Initiatives, Center for Teaching and Learning

Appendix B

Sample Badge Proposal Outline

Badge Title:

Brief Description:

Think "pitch" or answer to the question of "what does this badge represent?"

Suggested Tags:

(optional) Are there any alternative terms or phrases that can be used to describe this badge that people might search for? Use one or two word phrases.

Earning Criteria:

List all of the specific requirements that need to be met for a participant to earn the badge (e.g., full attendance, completing certain activities, demonstrating specific competencies, passing a summative assessment with a certain score or better)

Evidence:

(optional) Will any evidence of an individual participant's achievement be recorded as part of the awarding of the badge (e.g., links to participant artifacts or descriptions about the specific participant's accomplishments)? This would serve as evidence that supports the badge's claims and can make the accomplishment more credible.

Alignment:

(optional) Is this badge aligned with any external criteria (e.g., from specific standards bodies or professional organizations)? If so state which specific criteria and provide a link.

Will this badge expire?

(optional) Most badges will not need to expire, but some badges may represent specific training or skills that should be refreshed periodically.

*** items above are part of the default open badge metadata ****

Total hours of effort required by badge earners:

Include any face to face time plus all time a median student might be expected to engage with the materials (e.g., reading, assignments, projects)

Over what period of time will the badge be scheduled:

e.g. at own pace, some period or combination of days/weeks

Delivery modality:

e.g. face-to-face, online, hybrid

Learning Objective(s) for this Badge:

Think of the answer to the question: "upon successful completion of the program, participants will be able to…"

How will learning objective attainment be evaluated?

May reference the Earning Criteria if that covers this or add additional details here.

Is this badge part of a series?

Is this badge designed to stack towards an existing or planned academic certificate or degree?

if yes, which program(s) and what would it count as

Does the badge have any prerequisites (e.g., knowledge, other badges)?

Intended Audience:

e.g. current students (grad or undergrad?), prospective or new students, faculty, staff, industry professionals

Badging fees:

How much will be charged per badge and please include criteria such as: How will the fee be collected e.g. internal account transfer, via the Techshop (TouchNet Payment Gateway), etc.

When will the badge be offered?

e.g., On demand, specific date range(s), certain semesters or tracks

Badge rationale

describe the need for offering a badge; e.g., is there an industry need or a specific competency that students require that doesn't fit well within an academic course

Will there be an external partner?

If so, describe the role they will play, if there is a plan for a formal memoranda of understanding (MOU), and the current status of the relationship.

Contact(s)

Appendix C

FOSS Badge Proposal

Badge Title: Essentials of Free and Open Source Software

Brief Description: *introduction to command line Linux and Git revision control system, and various aspects of file and data management/processing. Other topics covered include data visualization using gnuplot, LaTeX document preparation system, minimal systems administration, and (semi) automation of computational (or visualization) workflows using functions and scripts.*

Suggested Tags: *Linux, terminal, Git, command line, gnuplot, LaTeX, scripts, system administration*

Earning Criteria: *Demonstrate proficiency in all modules by passing 10 graded quizzes with a score of 100%*

Will this badge expire? *No*

Total hours of effort required by badge earners: *25 hours (10 modules estimated at approximately 2.5 hours each)*

Over what period of time will the badge be scheduled: *at own pace*

Delivery modality: *online*

Learning Objective(s) for this Badge:

- *Use the command line to perform essential functions such as navigation, folder and file management, permissions control*
- *Use Git for version control*
- *Use gnuplot to manipulate and visualize data*
- *Perform basic document preparation in LaTeX*
- *Use simple functions*
- *Create scripts to perform simple tasks*
- *Utilize basic system administration tools to evaluate system and job status*

How will learning objective attainment be evaluated? *See Earning Criteria*

Is this badge part of a series? *No*

Is this badge designed to stack towards an existing or planned academic certificate or degree? *No, but could serve as a prerequisite or corequisite for certain courses for students needing the background.*

Does the badge have any prerequisites (e.g., knowledge, other badges)? *No*

Intended Audience: *students interested in scientific/research computing and all members of the High-Performance Computing (HPC) Shared Facility*

Badging fees: *$20 collected by internal account transfer (for faculty and supported graduate students) or via TechShop*

When will the badge be offered? *On demand*

Badge rationale: *The program exists to assist campus members who need fundamentals of operating in a Linux environment for research computing purposes.*

Will there be an external partner? *No*

Contact(s): Gowtham (g@mtu.edu)

Appendix D

GT Power Badge Proposal

Badge Title: GT Power Engine Simulation

Brief Description: To show demonstrated competency in GT Power sufficient for advanced internal combustion engine simulation and analysis

Suggested Tags: (none)

Earning Criteria: *80% on each of 5 modules that cover running and developing GT Power models, interpretation of results, and identification of key features of a model.*

Will this badge expire? *No*

Total hours of effort required by badge earners: *25 hours (*Five self-paced online modules. Typical effort is approximately 5 hours per module.*)*

Over what period of time will the badge be scheduled: *1 semester, at own pace*

Delivery modality: *online*

Learning Objective(s) for this Badge:

Run GT Power models, including implementing various parameters in the case setup, and plotting and interpreting the results.

Develop from scratch simple (single cylinder) GT power models, run the model for different cases, and plot and interpret the results.

Identify key features of a pre-built GT Power model, including solver functions, and built-in GT Power models and features needed to model IC Engines.

How will learning objective attainment be evaluated? See *Earning Criteria*

Is this badge part of a series? *No*

Is this badge designed to stack towards an existing or planned academic certificate or degree? *No, but could serve as a prerequisite or corequisite for certain courses for students lacking the background.*

Does the badge have any prerequisites (e.g., knowledge, other badges)? *No*

Intended Audience: *graduate students*

Badging fees: *$20 collected by internal account transfer (for supported graduate students) or via TechShop.* The modules require a trained GTA for real or virtual office hours, for answering questions, and for grading. This requires 0.5 FTE GTA for one semester.

When will the badge be offered? *On demand*

Badge rationale: *The program exists to assist graduate students who lack the needed background in using GT Power.*

Will there be an external partner? *No*

Contact(s): Craig Friedrich (craig@mtu.edu)

Appendix E

Questions to Consider Post Pilot

1. Badging levels
    a. Do we want to create badging series that allow “leveling up”?
    b. Should badges be able to stack into larger badges?
    c. Can badges convert to credit?
2. What are the opportunities to offer badges to non-Michigan Tech affiliates
    a. Is there value to outside learners?
    b. How do we track and maintain learners’ information (identity, contact, etc.) if we offer these to this population?
3. If we are to offer badges on a broad scale, what does industry consider when evaluating these credentials?
4. What is the enrollment process into a Canvas course that leads to a badge?
    a. How does a student approach the university?
    b. How are students enrolled in Canvas?
    c. Can the TechShop be part of this process when fees are collected?