2016

Bryn Mawr Digital Competencies Framework

Bryn Mawr College

To see how the digital competencies project is being realized at Bryn Mawr College, go to brynmawr.edu/digitalcompetencies
The framework was revised in October 2016.

Bryn Mawr Digital Competencies Framework

The digital competencies articulated here provide a framework intended to help individual Bryn Mawr students:

- Identify the digital skills and critical perspectives they will need to be 21st century leaders,
- Seek curricular and co-curricular opportunities to hone those skills and perspectives while at Bryn Mawr College,
- Develop ways of articulating and demonstrating their competencies to various audiences.

The framework is designed to be comprehensive and suggestive, but *not* a checklist that all students must complete before graduating. First, while we believe all students should develop the competencies listed as Digital Survival Skills, the other four areas of focus (Digital Communication; Data Management and Preservation; Data Analysis and Presentation; and Critical Design, Making, and Development) may be more or less relevant to different students, depending their academic, professional, and personal interests. Second, digital competencies are by nature open-ended and evolving. They change as technologies change: networking and file management, for example, looked very different fifteen years ago, before "cloud" storage options like DropBox, iCloud, or OneDrive were widely available.

The framework is an invitation to and a tool for students to reflect on the digital skills and critical perspectives they develop while in college. Bryn Mawr College students currently develop, and will continue develop, these skills and perspectives in different ways and through both curricular and co-curricular experiences. For example, one student might develop data management skills while conducting field research for a course project, but her peers might develop them working in Special Collections or interning for a non-profit. Some students may find in the framework new ideas for working with or thinking critically about digital technologies and seek opportunities to explore them. Others will recognize skills they have already developed and find language to describe them to different audiences. This emphasis on reflection and on finding synergy between curricular and non-curricular draws inspiration from the mission of Bryn Mawr's Leadership, Innovation, and Liberal Arts Center (LILAC), which will be a key partner in developing student-focused programming related to the framework.

Although the audience is primarily students, the framework can also help Bryn Mawr College faculty and staff identify existing curricular and co-curricular opportunities to develop digital competencies, and mindfully incorporate such opportunities into new courses and programs.

This framework grew out of experience faculty and educational technologists gained while developing digital course activities for the Andrew F. Mellon Foundation grant-funded initiative, "Developing a Liberal Arts Curriculum for a Digital Age." Students participating in these activities needed certain digital competencies to be successful, and faculty and staff began identifying skills and developing assessments and scaffolding to help students development them. Around the same time, a board-level Digital Bryn Mawr Task Force charged the Library and Information Technology Services (LITS) and the College more broadly with ensuring that students, faculty and staff develop the digital competencies needed to learn, teach, research and work in the modern age. We began adapting those early lists of digital skills into a broader framework, drawing on feedback from faculty, staff, recent alumnae, board members, and students.[1]

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[1] This document incorporates information literacy knowledge practices and dispositions from the *Framework for Information Literacy for Higher Education* developed by the American Association of College Research Libraries (ACRL).

1. "Digital Survival Skills"

1.1 Networks and file management

Developing this competency involves …

- Setting up a college user ID and password, and learning how to use it to log-in to college systems (e.g., Moodle, Bionic, e-mail, etc.) and campus computers
- Learning how to create, move, download, upload, and organize files and folders on a computer and on network drives
- Learning how to print to local and networked printers.
- Learning how to safely connect to (and perhaps manage) wired and wireless networks

1.2 Metacognition and life-long learning

Developing this competency involves …

- Learning how to assess your own digital skills and accurately identify areas of relative strength and weakness.
- Developing effective strategies for improving digital skills using on a range of methods, opportunities, and resources.
- Becoming knowledgeable about how digital technologies interact with human bodies and minds, and developing strategies for mitigating potential ill effects.

1.3 Troubleshooting

Troubleshooting is a logical, systematic search to determine the source of a problem and how to fix it. Developing this competency involves …

- Learning to recognize and generalize from patterns in technology-related problems.
- Learning to diagnose problems in complex systems by eliminating potential variables and interactions between variables
- Developing a "toolkit" of broadly applicable strategies for diagnosing and solving common problems like checking system requirements, clearing your browser cache, trying a different browser, seeing if classmates have the same problem, etc.

1.4 Managing digital identity, privacy and security

Developing this competency involves …

- Learning to effectively manage one or more digital identities.
- Critically analyzing how digital tools and media commodify personal data and online interactions, and how this commodification affects the information you receive, produce, and disseminate online.

Notes have been included throughout the document identifying them and the threshold concepts they relate to in the ACRL *Framework*.

- Critically analyzing the policies and business models adopted by digital publishers, in order to make informed choices to prevent identity theft, preserve confidentiality, manage reputation, and mitigate similar risks when browsing the Internet and using web-based tools and social media.[2]

1.5 Strategic web and database searching

Developing this competency involves …

- Learning how to assess your information needs, identify appropriate digital information sources and finding aids, and recognize when digital and digitized sources are inappropriate or insufficient.
- Developing a critical understanding of how search engines and algorithms work, how to use them effectively, and their limitations and appropriate use contexts.
- Developing a critical understanding of how common indexing schemes work, how to use them effectively, and their limitations and appropriate use contexts.
- Learning to find and use database- or site-specific filters and Boolean, wildcard, or other specialized search functions to effectively refine searches.[3]

2. Digital Communication

2.1 Collaborative communication

Developing this competency involves:

- Becoming familiar with and comfortable using a range of digital collaboration tools, such as file-sharing systems, collaborative editing and annotation tools, discussion forums, blogs, online chat, or web-conferencing.
- Learning how to effectively and conscientiously use these tools to work with others both synchronously and asynchronously.
- Developing critical perspectives and skills needed to co-create knowledge.
- Valuing user-generated content and evaluating contributions made by others.[4]

2.2 Digital writing and publishing

Developing this competency involves:

- Learning to effectively use digital word processing software to produce complex, professional, printed documents. Depending on your major and interests, this may involve learning:
  - To typeset mathematical or scientific formulae (e.g., with LaTeX)
  - To type and proof documents in multiple languages
  - To provide references in footnotes or endnotes.
  - To embed, format and caption images, charts, or tables
- Becoming familiar with and comfortable using textual mark-up languages, such as HTML, Wiki Markup, Markdown, LaTeX, XML, and MathML.

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[2] "Information Has Value." *Framework for Information Literacy for Higher Education*.
[3] "Searching as Strategic Exploration." *Framework for Information Literacy for Higher Education.*
[4] "Information Has Value" and "Scholarship as a Conversation." *Framework for Information Literacy for Higher Education.*

- Learning to critically analyze and effectively communicate using digital-age textual formats, such as hyperlinking and non-linear narrative.
- Becoming familiar with and comfortable using a range of digital publishing or social media tools, such as blogs, wikis, WordPress, Twitter, etc.
- Learning how to identify the digital publishing or social media tool that is most appropriate to given audiences, topics, and content.
- Learning how to give credit to other's creative work and original ideas, through attribution conventions appropriate for digital media.[5]

2.3 Audiovisual analysis and production

Developing this competency involves:

- Learning and using a range of methodologies to critically analyze images, film, audio recordings, animations and other audiovisual "texts" and how they are used.
- Learning to effectively communicate ideas using audiovisual media (podcasts, video, etc.) and techniques (e.g. digital story-telling).
- Becoming familiar with and comfortable using a range of tools for publishing and sharing digital audiovisual content, and learning to identify those most appropriate to given audiences, topics and content.
- Learning to format and optimize audiovisual media for sharing via different print and digital platforms.
- Learning how to give credit to other's creative work and original ideas using attribution conventions appropriate for audiovisual media.

3. Data Management and Preservation

3.1 Electronic data collection

Developing this competency involves:

- Learning to effectively use digital tools for collecting and recording data, such as online surveys, audio and video recording devices, and GPS-enabled cameras.
- Developing appropriate ethical and legal guidelines for using confidential or proprietary information and personal likenesses, including those involving minors.

3.2 Privacy, security and preservation

Developing this competency involves:

- Developing and practicing strategies for protecting your own data and data entrusted to you against theft, misappropriation or loss.
- Learning how to secure digital devices (laptops, smart phones) and accounts (college account, G-mail, etc.) against intrusion and loss.
- Learning how to identify sensitive information (e.g., personally identifying information, financial information, educational information) that requires higher than usual levels of protection.

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[5] "Information Has Value." *Framework for Information Literacy for Higher Education.*

3.3 Cleaning, organizing, and managing data

Developing this competency involves …

- Learning to efficiently clean, revise and manage data without danger of losing or overwriting it.
- Developing effective strategies for backing up and version control.
- Learning why and how to use unique identifiers and controlled vocabularies.

3.4 Metadata

Developing this competency involves …

- Learning to find, read, and critically analyze information about data, files, and digital objects that is stored in metadata, including data related to copyright and privacy issues.
- Learning how to use metadata and tagging to organize, store and locate data or retrieve collections of digital objects.[6]
- Developing a working knowledge of metadata or tagging schemas used with bibliographic records; images, files and other digital objects; datasets or texts.

4. Data Analysis and Presentation

4.1 Data queries and reporting

Developing this competency involves …

- Becoming familiar with and comfortable using a range of software tools for creating and manipulating data, such as Excel, MySQL, SPSS or ARCGIS.
- Learning how flat and relational databases are structured, and how to filter, sort and query these databases to find relevant information.

4.2 Data analysis

Developing this competency involves …

- Becoming familiar with and comfortable using a range of software tools for analyzing data, such as Excel, MySQL, SPSS, ARCGIS or R Studio.
- Learning to use formulae, functions or coded instructions to analyze data within one or more software tools.[7]

4.3 Critical data visualization

Developing this competency involves …

- Learning to critically interpret and evaluate arguments or meaning constructed through various different visual representations of data (e.g., charts, graphs, maps, timelines, infographics.
- Learning to effectively present data in one or more visual formats and choose the format most appropriate to a given audiences, topics, or content.[8]

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[6] "Searching as Strategic Exploration." *Framework for Information Literacy for Higher Education.*
[7] "Research as Inquiry." *Framework for Information Literacy for Higher Education.*
[8] "Information Creation as a Process." *Framework for Information Literacy for Higher Education.*

5. Critical Making, Design and Development

5.1 Algorithmic Thinking/Coding

Developing this competency involves learning to interpret, edit and articulate a set of coded instructions for a computational system or device to execute.

5.2 Design thinking

Developing this competency involves …

- Becoming familiar with a range of creative, iterative, goal-oriented design processes for creating, testing and refining new ideas or solutions to problems.
- Developing a personal "toolkit" of strategies for successfully creating, testing and refining new ideas or solutions to problems.[9]

5.3 Project management

Developing this competency involves …

- Becoming familiar with a range of strategies for scoping and shaping a project, organizing collaborative work on it, and guiding it from idea to culmination.
- Developing a personal "toolkit" of strategies for managing individual and group projects.

5.4 Digital research and scholarship

Developing this competency involves …

- Becoming aware of both traditional and emerging processes of knowledge creation and dissemination in a particular discipline.
- Developing first-hand experience with the digital tools and technology-enabled-methodologies that are transforming disciplinary research.[10] Examples include textual analysis, topic modeling, network analysis, GIS, and the creation of non-linear narratives and arguments.

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[9] "Information Creation as a Process." *Framework for Information Literacy for Higher Education.*
[10] "Information Creation as a Process." *Framework for Information Literacy for Higher Education.*