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How to Cite: Hilburger, Christina, Donna Langille, Melissa Nelson, Alessandra Bordini, Josie Ann Greenhill, Rebecca Dowson and Lisa Goddard. 2020. "Collaborating with GLAM Institutions." *Digital Studies/Le champ numérique* 11(1): 4, pp. 1–44. DOI: <https://doi.org/10.16995/dscn.377>

Published: 18 May 2021

Peer Review:

This is a peer-reviewed article in *Digital Studies/Le champ numérique*, a journal published by the Open Library of Humanities.

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RESEARCH

Collaborating with GLAM Institutions

Christina Hilburger, Donna Langille, Melissa Nelson, Alessandra Bordini, Josie Ann Greenhill, Rebecca Dowson and Lisa Goddard

This essay cluster features three essays by students which reflect on their experiences developing digital scholarly resources in collaboration with the GLAM sector (the acronym for galleries, libraries, archives, and museums). Each essay focuses on a particular project: a digital exhibit of Redpath Museum's precious seahorse collection, a digital collection of Renaissance books published by the printer-publisher Aldus Manutius held at Simon Fraser University Library Special Collections, and a digital exhibit of Victorian-era Pre-Raphaelite books hosted by the University of Victoria Library. In describing these projects, these essays reveal emerging models of digital pedagogy involving collaboration among students, faculty, and librarians. Lisa Goddard and Rebecca Dowson, academic librarians specialized in digital scholarship from the University of Victoria and Simon Fraser University, respond to these essays, offering their perspective on what student-GLAM collaborations add to the mission of academic libraries.

Keywords: GLAM institutions; digital humanities (DH); digital exhibit; digital curation; descriptive metadata; digital pedagogy

Ce regroupement de dissertation se compose de trois dissertations écrites par des étudiants qui réfléchissent à leurs expériences acquises en développant des ressources universitaires numériques en collaboration avec le secteur GLAM (l'acronyme anglais pour *Galleries, Libraries, Archives and Museums*, ou Galeries, Bibliothèques, Archives et Musées). Chaque dissertation se focalise sur un projet particulier : sur une exposition numérique de la collection précieuse d'hippocampes du Musée Redpath ; sur une collection numérique de livres de la Renaissance publiés par l'imprimeur-éditeur Aldus Manutius, ce qui se trouve dans les Collections Spéciales de la Bibliothèque de l'Université Simon Fraser ; et sur une exposition numérique de livres Pré-Raphaelite venant de l'époque victorienne qui a eu lieu à la Bibliothèque de l'Université de Victoria. En décrivant ces projets, ces dissertations révèlent des modèles émergents de pédagogie numérique qui nécessitent la collaboration entre des étudiants, des membres de faculté et des bibliothécaires. Lisa Goddard et Rebecca Dowson, des bibliothécaires

académiques qui se spécialisent dans l'érudition numérique de l'Université de Victoria et de l'Université Simon Fraser, répondent à ces dissertations, en donnant leur perspective sur ce que les collaborations étudiant-GLAM contribuent à la mission des bibliothèques académiques.

Mots-clés: institutions GLAM; humanités numériques (DH); exposition numérique; curation numérique; métadonnées descriptives; pédagogie numérique

Learning Beyond the Classroom: Collaboration Between Information Studies Students and GLAMs

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Practical experience is invaluable for soon-to-be information professionals, but unfortunately this type of experience is not often provided in the classroom. Some information studies programs offer this experience in the form of practicums or work cooperatives. These opportunities usually take place in the course of the term and are arranged by the administration. Students often have to enrol in a practicum or work co-op course and then follow the job search procedures of applying, interviewing, and either accepting or declining the position. These positions are either paid, unpaid, or for tuition credit. For example, at McGill University's School of Information Studies (SIS), challenges arise for students because the practicum placements are unpaid, limited, and successful placement is not guaranteed. The authors of this article believe that students should be compensated for their labour. Their work is valuable and therefore they should be paid for their contributions. However, we also acknowledge, as recent graduates, that practical experience is often necessary for achieving employment after graduation.

In addition to practicums and work co-operatives, students can gain practical experience by collaborating with galleries, libraries, archives, and museums (GLAMs) on projects as part of their course requirements. This type of informal collaboration allows students to have autonomy in the experiential learning process and provides students with the flexibility to negotiate their own contracts with institutions. This paper focuses on a student-led digital exhibit project completed in collaboration with the Redpath Museum in Montreal. In spring 2019, Christina Hilburger, Donna Langille, and Melissa Nelson, three former Master of Information Studies graduate

students from McGill University, digitized a selection of the Redpath Museum's seahorse collection and created a digital exhibit using the free trial version of Omeka.net, a web publishing platform. The project was completed to fulfil the requirements for the final assignment in our Digital Curation course, taught by PhD student, Morgannis Graham. The objective of the project was to make a sample of the museum's seahorse collection accessible to the public by exhibiting photographs of them online. Due to their delicate nature, the seahorses are currently not displayed in the museum. This paper summarizes the digital project and expands on the lessons that we learned by working with the museum. This case study provides an example of the value and challenges of collaboration between GLAMs and graduate students and advocates for a holistic approach to student digital project design. A holistic approach to project design gives students the opportunity to see the evolution of a project from the beginning to the end and provides them with opportunities to apply theoretical concepts covered in class to real-world situations. Practical experience will help students develop valuable skills for completing projects in their future professional roles. From communicating and coordinating with various stakeholders, to task delegation, and learning how to create a metadata crosswalk table, our experience demonstrates how student collaboration with GLAMs can provide a wealth of learning opportunities for future professionals while also benefiting the institution.

The criteria for the Digital Curation final project was flexible in that students were given the opportunity to design their own assignment as long as they were able to justify its relatability to the class learning outcomes. At the time of this course, Donna was volunteering weekly at the Redpath Museum and knew about the unexhibited collection of seahorses. The idea for this project was inspired by topics presented in the Digital Curation course such as accessibility, visibility, and digital preservation. We were cognisant that assignment work is often discarded after it is graded. We were drawn to the idea of working with the Redpath Museum because we wanted our project to be valued and used by the museum after the course was finished. Donna approached the Redpath Museum to find out if they would be open to us working with its seahorse collection as part of our final assignment. This

process required drafting a project proposal and meeting with Anthony Howell, the Curation Technician at the Redpath Museum. The project proposal included the steps we would take to complete the project, such as photographing the seahorses, and our intended outcome of a curated online exhibit which could be displayed on their website. None of us had written a project proposal before so this gave us the opportunity to practice writing a proposal and negotiating with multiple stakeholders. After the project proposal was accepted by both the museum and the instructor we were able to begin the planning process. The project was completed over the second-half of the semester and presented as our final assignment on the last day of class. As of today, the Omeka site is available at <https://seahorseproject.omeka.net/>.

This project benefited the Redpath Museum by providing them with a professional digital exhibit at no cost to them. With new advancements in technology, GLAMs have been making items in their repositories available online. One of the advantages to digitally preserving and exhibiting objects is an increase in access (Government of Canada 2017). However, digitization projects are often costly. Small, non-profit museums may face significant challenges when working on digital projects such as funding and institutional support. When these digital projects fall by the wayside, GLAMs miss out on unique outreach opportunities, as well as the chance to provide better access to their holdings. In return for our efforts, this project gave us hands-on experience digitizing materials without funds and limited access to advanced technology (such as 3D scanners). The digitization process demands detailed planning, flexibility, and “is best thought of as an incremental, ongoing, and ever-shifting set of actions, reactions, workflows, and policies” (Schumacher et al. 2014, 5). To the benefit of the student collaborator, these complex processes provide valuable professional experience. While we did not complete our goal of digitizing the entire seahorse collection, we were able to photograph a selection which can then be used for future curation, social media, or for research purposes.

We were able to apply many of the lessons that we learned in our Digital Curation course to our digital project with the Redpath Museum as well as expand our knowledge on topics related to the course content. In our Digital Curation course, we

learned that one of the first steps in a digital preservation workflow is creating digital replicas of the object. With more funding, museums can purchase 3D scanners to digitize their cultural collections. These scans provide a 360-degree perspective of the object. Small and non-funded museums are likely to use photography because digital cameras are more affordable and more readily available. We decided to photograph them as we already had access to a high-resolution digital camera. Since the seahorses were extremely delicate, we were not able to travel with them. All photography was completed in the basement of the museum where the specimens were kept.

Photographing artifacts requires a logistical plan that covers how the artifacts will be photographed, what equipment will be used, and what type of file formats the photographs will be in. We used the Digitization Standards for the Canadian Museum of Civilization Corporation (2006) as a guide for our photographing process. The standards recommend that you use a “black or neutral grey background”, that the artifact is “placed straight” and to include the “artifact catalogue number” (26). Raw or TIFF are the recommended file formats (Sharma 2012; Wolf & Gottlieb-Miller 2017, 339). We created multiple copies of digital surrogates so that we would have backup copies as well.

Our goal was to provide, to the best of our ability, high-quality photographs of the seahorses. The technical challenge of this encouraged us to utilize each other's skill sets. As none of us are professional photographers, it took some research to figure out how best to photograph the collection. We chose one of our personal cameras, a Nikon D3000. Although the museum offered us a camera, we decided to use the Nikon because of our familiarity with it. We also decided on the appropriate file formats before shooting. RAW files preserve all of the original detail of a shot whereas JPEG automatically processes the images, adjusting sharpness, saturation, contrast, and so on. While the Nikon D3000 can shoot in both RAW and JPEG simultaneously, it was not necessary to upload both file formats to the Omeka site. Ideally we would have included the original raw image file; however, this file type takes up significantly more space. As the free trial version of Omeka has limited space, the compressed JPEG file was sufficient. The black backdrop we used brought

out the details of the seahorses, however it also captured hundreds of dust particles that had to be edited out during post-processing. To remove these particles, Christina used Adobe Photoshop CS6. This digitization challenge, though time-consuming, was a great opportunity for her to continue using and building upon her image editing skills.

While smaller institutions may have the aspiration to digitize or create digital exhibits, both endeavours can be costly. Costs include not only the equipment but also the time and labour that it takes to digitize. In addition to limited budgets, Schumacher et al. (2014) name other restrictions for smaller institutions such as “small staff sizes, a lack of specialized expertise, [and] dated technical infrastructures” (3). Omeka is an affordable option for institutions that want to create their own digital exhibits. Omeka has two platforms: Omeka.net and Omeka.org. Omeka.org is free and downloadable but requires that it be hosted on a server (Rath 2016). Omeka.net is one of the best options for small or non-funded institutions because the trial version is completely free (albeit with a very basic structure). The platform also requires minimal to no technical or programming experience and is fairly accessible for beginners (Rath 2016).

Unlike an online catalogue or database, digital exhibits need to curate the digitized or born digital objects in a way that is visually pleasing and entertaining to the user. Omeka is a resource that allows you to create both “object-oriented exhibits that require rich and precise item representation, and information-oriented exhibits that need flexible means of organizing and showcasing these items within a conceptual framework” (Marsh 2017, 365).

One must consider the user's needs when creating a cultural exhibit. Miriam Posner (2013) recommends planning the exhibit before uploading objects and to plan based on the message you wish the exhibit to convey. When organizing our exhibit, we had to take into consideration who our users were. As a biological collection, we anticipated use by university researchers and community users with an interest in seahorses and marine biology. To meet the needs of the researchers, we decided to include detailed metadata with each of the images. Once a workflow or a wireframe has been created and the objects have been uploaded to the site, Omeka requires that

you create metadata for each item. The default metadata schema that Omeka.net uses is Dublin Core. Unfortunately, Omeka.net limits metadata possibilities, whereas Omeka.org allows you to “implement project-specific metadata sets as needed” using plug-ins (Kucsma, Reiss and Sidman, 2010). This option provides a lot more flexibility when creating a digital exhibit especially when the objects may not be appropriate for Dublin Core.

We uploaded the images to the Omeka site and added descriptions at the item and series level. While Dublin Core is a flexible and widely adapted metadata scheme, we realized that it does not offer the granularity to describe biological specimen. Searching for the most appropriate metadata scheme, we discovered that Darwin Core (TDWG 2015) was created as an extension to Dublin Core to provide a standard for biodiversity data. We then determined that the best way to proceed with the project was to map Darwin Core to Dublin Core to create appropriate descriptions for the seahorse collection. Melissa determined how to crosswalk the metadata schemes to the best of her abilities. A crosswalk is a table that helps a user map one metadata standard to another. Melissa documented her decisions in the “scope note” section of our table to clarify how Dublin Core elements would be used for this project. When entering descriptions, this crosswalk table was used as a reference to keep the metadata as consistent as possible.

As Dublin Core (DCMI 2012) was created with digital and web-based resources in mind, creating a crosswalk between these two standards was challenging. Dublin Core elements, such as “title,” “creator,” and “contributor,” were intended for items that have been produced by individuals, organizations, or services. It was difficult to determine which Darwin Core elements appropriately corresponded to Dublin Core elements as the seahorses were living organisms rather than items created by an entity. Additionally, some of the controlled vocabularies recommended by Dublin Core Metadata Initiative were difficult to adapt to this collection (DCMI 2012). In particular, The Getty Thesaurus of Geographic Names (TGN) established separate hierarchies for bodies of water and geographic locations. This presented issues when entering descriptions for the coverage field, as the catalogue cards for the seahorse collection combined bodies of water and geographic locations to describe the spatial

region each seahorse originated from. As opposed to using TGN as a controlled vocabulary, we decided to use it as a guideline for spelling place names. We decided to follow the catalogue cards and enter the location of origin into a hierarchy of body of water, administrative region, then country.

Despite these challenges, the planning and implementation of the crosswalk table helped us create appropriate and relatively consistent descriptions for the collection. Ideally, if we had the financial resources to do this project, we would have used a platform that gave us the flexibility to choose from a variety of metadata standards and select the most appropriate standard for the collection. We also recognize that with more time and resources it would have been beneficial to explore linked data applications for small museums and resource discovery.

Another important aspect we had to consider while organizing this project was how to preserve the large number of files created in the digitization process. Digital storage is important for preservation but obtaining storage can be a challenge for smaller institutions that have minimal budgets. The size of storage depends on the amount and size (i.e. file types) of the digital surrogates. Schumacher et al. (2014) recommend that smaller institutions upload public domain materials to the Internet Archive “for public access and long-term storage” (13). In every case, it is important to consider how the images will be managed and to plan “a policy for managing the assets once they have been created” (GOC 2017). The Digital Preservation Handbook from the Digital Preservation Coalition (2015) recommends more than one backup copy of your files due to the risk of “damage, decay or accidental deletion”. Lots of Copies Keep Stuff Safe (LOCKSS) is another program, created at Stanford University, that advocates for multiple copies for preservation and storage (Stanford University, 2020). LOCKSS encourages planning for obsolescence, upgrades, and file migration to ensure long term management and future access to your digital images. Images should be stored in different locations in case they are affected by different disaster threats. For example, the items might be kept on a computer hard drive, an external hard drive, a USB drive, and cloud services such as Dropbox or Google Drive.

As we had no funding, we were unable to devise a proper plan for long-term preservation. As a compromise, we gave the Redpath Museum both JPEG and TIFF

file formats on a Google Drive folder and insisted that they at least store the files on another external source such as a hard drive. If we were to continue working on this project, we would advocate for a preservation strategy and policy. Fortunately, our main goal of the project, which we identified to the Redpath Museum at our first meeting, was to provide access to the seahorse collection which we achieved by uploading the photos to the Omeka website. We gave the Redpath Museum editorial access to the Omeka website so that they can continue to digitize and upload more of the seahorse collection if they wish to.

Another important aspect we considered when we created the digital exhibit is copyright and reuse. Melissa Terras (2015) argues that not enough cultural institutions allow their digital materials to be used for creative purposes. She asks, “what ‘access’ are institutions actually providing, if it’s only of the ‘look but don’t touch’ variety?” (Terras 2015, 35). Museums need to be aware of their authority to digitize and exhibit their collections. According to the World Intellectual Property Organization (2016), museums may be exempt from the copyright laws if they intend to “reproduce the works they hold for the purposes of preservation”. However, these laws depend entirely on the jurisdiction and the jurisdiction may dictate whether or not the museum is allowed to reproduce materials for other purposes such as dissemination. Due to the time constraints of the project, we did not have the chance to speak with the museum about openly licensing the Omeka site to make the digital surrogates open access. However, this project prompted us to consider and research copyright implications for digital exhibits, providing a learning opportunity that we may have not encountered in the classroom.

Conclusion

A holistic approach to projects between students and GLAMs allows students to gain experience with every stage of the digital project including creating a workflow, creating metadata descriptions, digitizing items, and creating a preservation policy. In return, students can contribute something of value to their field while obtaining credit for their professional degree. Our experience working with the Redpath Museum was positive, but we recognize the problematic nature of unpaid internships, practicums and other positions of a voluntary capacity, in the realm of GLAMs. We

viewed our short-term project as more akin to the instructional practice of taking students to an institution's archive or special collections to complete hands-on research assignments rather than an uncompensated role with the institution. Museums that are non-profit or are low-funded should not employ students as a way to avoid labour costs but to build mutually beneficial relationships where students can gain a holistic approach to digital projects.

In order for there to be equitable collaboration between students and GLAMs, students should be considered valued partners who bring their own unique set of skills and knowledge to a project. This project would not have been as successful without the trust of the Redpath Museum, and our instructor, in us to do this work. In return, our digital exhibit of the seahorse collection will provide educational opportunities for people to learn about seahorses as well as bring attention to the vast collection stored in the vaults of the Redpath Museum that is available to researchers. We finished the course with a sense of accomplishment knowing that our final project will be seen, used, and valued by our communities instead of ending up in a desk drawer at the end of the semester. Our project may be seen as a catalyst for what could be a mutually beneficial relationship between the Redpath Museum and the School of Information Studies for years to come.

Acknowledgements

Thank you to the Redpath Museum, especially Anthony Howell, for trusting us with their remarkable seahorse collection. Our appreciation goes out to Dr. Sara Lourie for her incredible marine biology and conservation research. Many specimens in the seahorse collection were collected because of Dr. Lourie's efforts. We would also like to thank Morgannis Graham for her support and encouragement throughout the process of working on this project. Her captivating Digital Curation course at McGill University provided us with this incredible opportunity and the toolbox we needed to do it properly.

Competing interests

The authors have no competing interests to declare.

Author contributions

Authors are listed in alphabetical order. Contributions to this essay were split equally between the three authors.

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Metadata Challenges and Solutions: Describing and Contextualizing SFU's Wosk–McDonald Aldine Collection Online

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Introduction

Nearly five years have passed since the quincentenary of the death of Renaissance Italy's best-known printer-publisher, Aldus Manutius (ca. 1451–1515). Aldus's many innovations—in typography, book design, and production as well as in scholarship and education—can rightly be considered milestones in the development of print culture and the Western canon: technological and cultural advancements that would change the landscape of book publishing in ways that are still visible today (Harris 2016, 346–385; Maxwell 2015). As a recent project hosted by the Consortium of European Research Libraries (CERL) revealed (Sachet 2016), the scale and variety of initiatives organized across the globe in the wake of the latest Aldine anniversary attests to both Aldus's international stature and the enduring relevance of his work.

The Aldus@SFU project is one such initiative. The project, led by the Publishing Program at Simon Fraser University (SFU) with the support of SFU Library Special Collections, seeks to make available online a significant portion of SFU's Wosk–McDonald Aldine Collection through a public-facing website: Aldus@SFU (2015). The collection, which overall comprises nearly a hundred titles, is one of the largest Aldine collections in Canada, taking pride of place among the institution's holdings (Stanton 2015). The website currently showcases 21 fully digitized volumes published during Aldus's lifetime, between 1501 and 1515, and plans are in the works to feature a new group of 26 digitized Aldines, spanning from 1515 to 1529, on a new and improved version of the website.

From its inception, the project's primary concern has been to move beyond the mere digitization of the materials to a more meaningful and engaging model of online

remediation, with the greater aim of connecting Aldus's work with new and broader publics, both *within* and *beyond* the academy. In other words, the scanning of the volumes was but the first step of a more ambitious, long-term plan aimed at creating an educational online resource for non-specialist audiences, while simultaneously providing an open, interconnected platform for collaborative scholarship (Bordini and Maxwell 2018).

A preliminary condition for achieving this goal was the creation of rich *descriptive* metadata to accompany the digitized books. In this paper, I explore this foundational aspect of the curatorial process from my perspective as a student and, later, as a project manager, envisioning the activity of metadata creation as integral to the project's success. In what follows, I discuss some of the key metadata decisions (and compromises) made by the project team to support the digitization of the Wosk–McDonald collection. Using examples from the Aldus@SFU project as a case study, I attempt to illuminate how our descriptive metadata approach has evolved since the project's inception in 2015. The goal is twofold: first, to offer a practical overview of the challenges and opportunities associated with this important but often unduly obscure or, worse, underappreciated aspect of public-facing, library-based digital humanities initiatives; second, to highlight the vital role of collaboration in the creation of accurate and well-structured metadata, and, therefore, in ensuring access and *adding value* to digitized cultural collections.

With this exploration of metadata creation as an increasingly collaborative process, I also bring insights from my dual perspective as a former student in the Master of Publishing program at SFU (at the inception of the project) and a researcher working closely with the Library staff (after graduation). The benefits of my student perspective were twofold. First, as a student, I was able (and encouraged) to focus all my efforts and intellectual labour on a single project, towards the achievement of a measurable, personal goal: the completion of my internship, an essential component of my program of study. Second, as a beginner digital humanist, I was venturing into unknown territory, walking on a path where lack of immediate results became, despite often being frustrating, integral to my learning. Acknowledging (and incorporating) failure as part of my academic and professional development, indeed,

was one of the most valuable lessons I took from my internship experience. The transition from student to researcher, on the other hand, gave me the opportunity to extend the horizons of my practice and methodology. Working with like-minded team members and being actively involved in the back-end infrastructure underlying the public-facing website, I began to see the bigger picture, developing a sense of belonging to a larger scholarly community, which was simultaneously novel and empowering to me.

Creating descriptive metadata for SFU's digital Aldines: A retrospective overview

One of my responsibilities as lead researcher for the Aldus@SFU project was to provide full bibliographic descriptions, or *descriptive metadata*, for the first group of Aldines selected for digitization. Going beyond the etymological meaning of the term ("data about data"), we can think of metadata as a powerful lens that filters the information we want to know about a resource and makes it possible for us to find it. My task, specifically, was to create the most common type of metadata in a library environment: descriptive or bibliographic data, which provides a structured description of the intellectual content of a resource, often including information about its physical properties, primarily for purposes of identification, discovery, and retrieval.

The activity of recording descriptive information for the digital objects occurred early in the Aldus@SFU project's planning phase. This has been a convoluted and often challenging process, and a quick chronological overview may help clarify its most significant stages.

Summer 2015: First phase of digitization and metadata development

In the summer of 2015, a few months before the first phase of digitization was completed, the project team began collecting the descriptive information associated with the books. After consulting the Library's old catalogue records, collection notes, and other relevant information contained in a bulky binder in the Special Collections vault, we were able to review and integrate the bibliographic descriptions with new

or previously omitted information. While attempting to ensure the descriptions met high standards of accuracy, completeness, and consistency—which have been identified as the most common criteria used to evaluate the quality of metadata (Park 2009)—we also strove to represent the uniqueness and cultural significance of the materials.

Our main concern as publishing studies scholars was to communicate the value of the books as visual and physical artifacts. To this end, we created custom metadata fields to describe the material and aesthetic properties of the books (Bordini, Lastoria, and Maxwell 2017). More specifically, as detailed in **Table 1**, by introducing new

Table 1: The asterisk (*) identifies the custom metadata fields specifically developed for the Wosk–McDonald Aldine Collection.

Bibliographic record for the 1505 Aldine Aesop	
Author	Aesopus
Title	Habentur hoc uolumine haec, videlicet. Vita & fabellae Aesopi cum interpretatione Latina ... Gabriae Fabellae tres & quadraginta ex trimetris iambis, praeter ultimam ex scazonte, cum latina interpretatione ... Phurnutus seu, ut alii, Curnutus De natura deorum
Short title	Vita & fabellae
Language(s)	Ancient Greek
Publication date	1505
Format	Folio
*Device Application	Back
*Trimmed page size	183 × 270 mm
*Extent	84pp
*Thickness	6 mm
*Pagination scheme	Column
*Text block	55 × 208 mm
*Text column(s)	2
Call number	PA 3851 A2 1505
Permanent catalogue link	http://troy.lib.sfu.ca/record=b1837297~S1a
Renouard reference	49:6

metadata fields such as *Device Application*, *Trimmed Page Size*, *Thickness*, *Pagination Scheme*, *Text Block*, and *Text Column(s)*, we intended to highlight the distinctive features of SFU's Aldines and, just as importantly, to convey those aspects of "a book's material presence" that are inevitably lost in the transition to the digital realm (Werner 2019, 141). That said, it is always important to be mindful that the digital facsimile and its physical counterpart are two separate objects and, by displaying a book online, we are not actually providing access to the original work, but rather enabling "a *kind of access to a new kind of surrogate*" (Beasley, 2007 27). Additionally, by creating metadata with a high level of granularity, we intended to present the knowledgeable niche communities of users (e.g., Aldine scholars, book historians, and bibliophiles) with more advanced search options. This enables specific metadata fields (such as Device Application, Format, Edition) to serve as navigation aids, allowing users to refine search results via a faceted navigation.

Fall 2016: Migration of SFU Library's digitized collections to Islandora

In 2016, two important workflow and infrastructure changes occurred, shifting the project's direction significantly. First, SFU Library migrated its Digitized Collections from CONTENTdm to a new repository platform, Islandora (Simon Fraser University Library 2020). Second, Aldus@SFU became one of the first projects supported by SFU Library's Digital Humanities Innovation Lab (DHIL 2020). These developments were key to moving our metadata work forward in two ways: on the one hand, by increasing our awareness of the key role metadata standards play in ensuring the reliability and interoperability of records; and, on the other, by making our metadata creation process, and the project in general, less siloed and more oriented towards collaboration. By "siloed," I mean that, in its early days, the project was rather insular: our practices were confined in a restricted digital environment (in the form of a Google Drive folder shared solely within the project team). Moreover, our direct interactions with the Library staff were extremely limited. By connecting our project to a larger infrastructure, the DHIL has been instrumental in making us better aware of the need for greater collaboration and more transparent communication across institutional boundaries, thus ensuring that our digital project received an adequate level of customized support.

The major undertaking of migrating SFU Library's digital collections to Islandora was justified by the need to adopt a more robust, flexible, and widely supported repository system (Bordini and Maxwell 2019a). Becoming familiar with the complexities of this new, multi-layered ecosystem, as described by Islandora founder Mark Leggott (Owens 2013), was essential for the success of the project. Understanding the interconnected components of Islandora's architecture—how the various parts of this ecosystem communicate with each other—was particularly important during the upload of the XML-based metadata. Since Islandora is a hybrid environment, which glues together the preservation layer (where all the content models and metadata are stored) and the presentation layer (how content is displayed), this type of knowledge was key to identifying problems and finding solutions when things broke (which they often did).

2017–2018: Second phase of digitization and metadata enrichment using MODS

An improved understanding of metadata standards meant that we could take advantage of the rich XML-based schema adopted by SFU Library to describe digital resources: Metadata Object Description Schema (Library of Congress 2020). MODS' highly granular and hierarchical structure allowed me to capture aspects of the books that had not been recorded before.

One of them was the highly collaborative nature of Aldus's publications. A key component of the Aldine press's extraordinary and enduring success, indeed, was its reliance on an efficient network of highly skilled and knowledgeable collaborators (Staikos 2016, 61–66). Using the MODS' grammar, I was able to include detailed information about Aldus's scholarly circle (patrons, editors, translators, proofreaders, and so on), specifying the role of each collaborator in relation to the resource—in both text and coded form for increased processing power (Miller 2011, 174). As shown in the example below, I chose a rather complex form to represent personal names, using controlled forms from the Library of Congress list and, whenever applicable, including name variants in Greek and Latin.

```
<name type="personal" authorityURI="http://id.loc.gov/authorities/  
names" valueURI="http://id.loc.gov/authorities/names/n79026763.html"  
usage="primary">
```

```

<namePart>Plutarch</namePart>
<namePart lang="grc" script="grek">Πλούταρχος [Greek]</namePart>
<namePart lang="grc" script="latn">Ploutarchos [Romanized]</namePart>
<namePart lang="latn" script="latn">Plutarchus [Latin]</namePart>
<displayForm>Plutarch</displayForm>
<role>
  <roleTerm type="text" authority="marcrelator">creator</roleTerm>
  <roleTerm type="code" authority="marcrelator">cre</roleTerm>
</role>
</name>

<name type="personal" authorityURI="http://id.loc.gov/authorities/names"
valueURI="http://id.loc.gov/authorities/names/n79117173.html">
  <namePart>Manuzio, Aldo</namePart>
  <namePart type="date">1449 or 1450–1515</namePart>
  <displayForm>Aldo Manuzio, 1449 or 1450–1515, publisher,
  dedicator.</displayForm>
  <role>
    <roleTerm type="text" authority="marcrelator">publisher</roleTerm>
    <roleTerm type="code" authority="marcrelator">pbl</roleTerm>
  </role>
  <role>
    <roleTerm type="text" authority="marcrelator">dedicator</roleTerm>
    <roleTerm type="code" authority="marcrelator">dto</roleTerm>
  </role>
</name>

```

Considering that, in the majority of cases for our Aldine collection, a single record is associated with multiple contributors, it is easy to imagine how going into this level of detail might become a painstaking task, requiring a great deal of care and effort.

Yet, when generating these records, the real challenge was not the granularity and richness of the descriptions; instead, it was striking a balance between standardization and customization. In fact, however flexible and rich, MODS is a standard and, as such, not always suitable for a high level of customization. The encoding and rendering of our custom metadata fields in Islandora's "out-of-the-box," complex ecosystem proved particularly difficult and time consuming.

The metadata element <extent> offers a case in point. Initially, in line with our interests in publishing studies, we intended to use this field to represent only the number of pages of the books. But in MODS, <extent> is a specific sub-element of the container element <physicalDescription>, used for the complete physical description and not repeatable. So, as highlighted in the example, if you encode this information improperly in MODS (in this case by adding the wrong attribute), the XML document will not validate against the schema.

```
<physicalDescription>
  <form authority="marcform">print</form>
  <extent>1, 166, 1 leaves ; 16 cm (8vo)</extent>
  <extent unit="pages" displayLabel="Extent">884 pages</extent>
  <note type="physicalDetails" displayLabel="Format">Octavo</note>
  <note type="physicalDetails" displayLabel="Device
    application">Front;Back</note>
  <note type="physicalDetails" displayLabel="Trimmed page
    size">86 × 163 mm</note>
  <note type="physicalDetails" displayLabel="Thickness">11 mm</note>
  <note type="physicalDetails" displayLabel="Text block">57 × 117 mm</
    note>
  <note type="presentation" displayLabel="Pagination scheme">Double-page
    spread</note>
  <note type="presentation" displayLabel="Text column(s)">1</note>
</physicalDescription>
```

The solution here was rather straightforward: getting rid of our custom <extent> field and keeping only the traditional bibliographic descriptor. But this was only a temporary fix. In fact, when loaded into Islandora's test instance, our MODS custom descriptions still would not be rendered properly. In the default display, the metadata labels completely disappeared, merged together into one field. This is shown in **Figure 1**. Evidently, something was wrong in the source code and we needed to fix it. How did we do this? By reaching out to our own institution's experts and technicians. In this specific case, a game-changer for us was being able to connect and work closely with SFU's multiskilled team of library and IT professionals (cataloguers, digital services librarians, and developers); without their active contributions, this small success story might have had a different ending.

After a number of unsuccessful test displays, we were able to find a satisfactory solution by using a generic descriptor: the MODS element <extension>. The snippet below shows how we did it.

```
<extension>
  <physicalDescription_Book_format type="Aldine archival description
    metadata">Folio</physicalDescription_Book_format>
  <physicalDescription_Device type="Aldine archival description
    metadata">Front; Back</physicalDescription_Device>
  <physicalDescription_Trimmed_page_size type="Aldine archival description
    metadata">167 × 283 mm</physicalDescription_Trimmed_page_size>
```

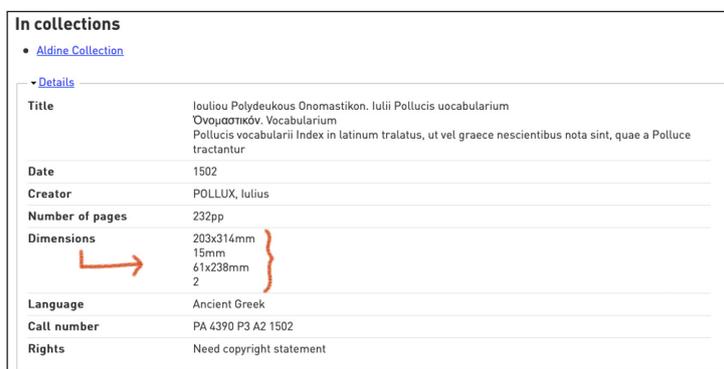


Figure 1: Incorrect display of custom metadata fields in Islandora.

```

<physicalDescription_Thickness type="Aldine archival description
  metadata">67 mm</physicalDescription_Thickness>
<physicalDescription_Text_block type="Aldine archival description
  metadata">118 × 207 mm</physicalDescription_Text_block>
<physicalDescription_Pagination_scheme type="Aldine archival description
  metadata">Single Page</physicalDescription_Pagination_scheme>
<physicalDescription_Text_columns>1</
  physicalDescription_Text_columns>
</extension>

```

With this correction, our custom metadata fields were displayed properly, as shown in **Figure 2**.

Current efforts and possible metadata enhancements

At present, we are in the final stage of integrating the metadata records into SFU's digital repository.

We continue to aim for consistency, completeness, and accuracy in describing the resources, aware that our description methods should *always* be informed by users' needs and preferences (Schaffner 2009). We are also aware that, unsurprisingly, there are areas of our metadata work that could be improved. A desirable enrichment, for example, would be to record important copy-specific information, such as provenance information, in a more structured way.

Subject	Ethics, Ancient
Genre	Essays
Physical description	1,050 pages ; 30 cm (fol.)
Book Format	Folio
Device	Front; Back
Pagination	Single Page
Text block	118x207mm
Thickness	67mm
Trimmed page size	167x283mm
References	Renouard 55:1
Classification	PA 4368 A2 1509
Part of	Wosk-McDonald Aldine Collection (Simon Fraser University Library)
Permalink	http://trov.lib.sfu.ca/record=b1838763-S1a
Rights	Need copyright statement

Figure 2: Correct display of custom metadata fields in Islandora.

It would also be desirable, for purposes of long-term preservation or re-use, to include more information about the digital facsimiles themselves. For example, we could incorporate image metadata (Werner 2019, 114–115) to make the institutional and technical choices behind the digitization process—and the technical and intellectual labour involved—more visible. These improvements would provide an opportunity to tell a fuller and more accurate story about the books that we are showcasing online.

Conclusion

High-quality and well-structured metadata descriptions are crucial to increasing the discoverability of digitized materials, with the potential to encourage broader engagement among a variety of audiences. The case study described here shows that interdisciplinary and interinstitutional collaboration is key to achieving this goal. At the beginning of the project, our approach and practices in metadata development were mainly solitary, due to my position as a student-novice digital humanist and the limited direct involvement of other scholars, students, and Library experts within our own institution. Along the way, however, a number of substantive changes involving infrastructure and staff capacity—the migration of SFU's digital collections to a new repository system and the establishment of a Lab to assist researchers engaged in digital scholarship—moved the project toward a more collaborative model. At the same time, my own approach to metadata curation, and the project in general, shifted, as I became more aware of the possibilities and constraints—not only technical but also socio-cultural—within which I was operating in my new role as a project manager. It became increasingly clear that sharing expertise (and values) within a community of peers—discussing common problems and possible solutions—is an essential factor in developing and maintaining a successful digital project.

Acknowledgements

This article is a revised and expanded version of two talks I gave, one at the Digital Student Showcase, hosted by the SFU–UVic Digital Pedagogy Network (Bordini 2018), and another, with John Maxwell, at UVic's DSI 2019 Conference and Colloquium (Bordini and Maxwell 2019b). I am greatly indebted to a number of people for their continued and valuable support. First and foremost, I am deeply grateful to John

Maxwell, whose encouragement, critical insight, and guidance have been essential in moving the project forward. I would also like to thank the generous professionals at Simon Fraser University Library for their priceless collaboration. Thanks in particular to: Mark Jordan (Library Management, Digital Strategy), Melissa Salrin (Special Collections & Rare Books), Janice Banser (Digital Library Services), Michael Joyce (Digital Humanities Innovation Lab), and Janette McConville (Cataloguing) for quickly addressing my metadata-related queries and kindly sharing their knowledge and expertise.

Competing interests

The author has no competing interests to declare.

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Digital Humanities Projects in Collaboration with GLAM Institutions: A Student Perspective

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Galleries, libraries, archives, and museums (GLAM institutions) often use digital platforms and tools to showcase their collections. From a student perspective, access to online collections has become an expectation. Whether it be a museum's digital collection of art objects or a rare publication available via Internet Archive, digital collections and other online resources are central to student research. However, students themselves are often only the consumers—rather than producers—of this knowledge. Digital Humanities (DH) projects give students the opportunity to become knowledge producers while also offering new and creative approaches to course content and individual research. DH projects also facilitate interdisciplinary collaboration and, further, collaboration across academic, non-academic, and professional sectors (Rath 2016, 159). Students are somewhat displaced from these sectors, and undergraduate students in particular are non-specialized early researchers with fewer connections to individuals or institutions undertaking DH projects. Where, then, do students fit into this collaborative network of knowledge production, dissemination, and visualization? And what are the benefits of student contributions to DH projects? My purpose is to answer these questions through an analysis of my student-led and researched Omeka exhibition. I began working on this exhibition as an undergraduate student and fellow in the University of Victoria's (UVic) Electronic Textual Cultures Lab (ETCL). Beyond the ETCL, the project required further collaboration with my institution's library, special collections and archives, and experts in related fields. This article discusses the planning and outcome of the project, the challenges that arose in the process, and the resulting benefits to show how undergraduate involvement with digital projects have a positive impact on both students and the field of DH alike.

The exhibition, titled “Beauty and the Book: Pre-Raphaelite Artistic Practice Contained” (Uvic Libraries Omeka ClassicClassis 2020) (was developed during an Open Knowledge Practicum offered by the ETCL. The ETCL encourages the production of open-access research through these practicums, which are open to members of the university community and the community at large. As an art history student, I was particularly interested in digital exhibitions as a means of visualizing my research. Omeka is an open-source content management system and exhibition tool available in two different versions: Omeka.org and Omeka.net. The distinctions between these versions have been covered elsewhere (Rath, 2016; Hardesty, 2014) but the user’s choice should depend on project’s needs. I did not need the additional customization options, but I chose Omeka.org because it enabled my exhibition to be hosted on the UVic Libraries server. Linda Rath has noted that Omeka’s flexibility (i.e. customizable themes and exhibition templates; option to install plug-ins) and accessibility (i.e. free and open-source) facilitates use by non-specialist creators, despite the large number of GLAM institutions that use the platform to highlight their collections (2016, 160). As a non-specialist user, these benefits were apparent at the outset of the project. Omeka’s flexibility makes the platform adaptable to a range of content and, likewise, its accessibility is adaptable to a range of user skill levels. Before delving into how these features benefited my particular project and enabled my entry into collaborative DH with GLAMS, I will first provide some context about the exhibition’s content.

The Pre-Raphaelite Brotherhood (PRB) was formed in 1848 by Dante Gabriel Rossetti, William Holman Hunt, and John Everett Millais. The Brotherhood sought to revitalize British art by promoting a return to a style preceding the influence of the high Renaissance artist Raphael. The desire for this revitalization also grew out of dissatisfaction with the Royal Academy, and, more broadly, the increasing industrialization and socio-political upheaval in Victorian Britain. Narrative paintings are a particularly important part of the Pre-Raphaelite canon. They visualized narratives ranging from biblical scripture to contemporary literature, and these subject choices suggest the importance of literature for the Brotherhood early on (Kooistra 2011, 41). Pre-Raphaelite painting and illustration also share reciprocal influences. The artists’ backgrounds as painters affected their conceptualization

of illustration and many of their paintings share similar aesthetic values with illustrations. Discussions surrounding the Pre-Raphaelite Brotherhood often extend to affiliates beyond the founding artists and the movement shifted throughout time, but Pre-Raphaelitism is broadly characterized by ennobling or moralizing subject matter, by according truth to nature and, in line with these tenets, by rendering the chosen subjects in hyper-detail.

I used prevalent art historical methodologies in my research for the exhibition, such as detailed formal and visual analyses, focus on materiality, and the comparison of objects, in order to establish the book as a paradigm for the early Pre-Raphaelite Brotherhood's artistic practice and, thus, as an access point to multiple arts (poetry, illustration, typography, and bindings). I argued that these elements qualify the book as an integrated, visual art object in itself, one that fits into a unique category as both a multi-sensory and collaborative art object, namely among illustrators, engravers, authors, and publishers. The decorative, flattened planes of Pre-Raphaelite art are best encapsulated on the printed page (Kooistra 2011, 42) and illustration provided another outlet for the Pre-Raphaelite Brotherhood's characteristic physical *and* psychological interpretations of their subjects (i.e. their illustrations visualize readings beyond the text itself).

Applying the aforementioned art historical methodology necessitated a focus on the contexts of creation of both the visual and material qualities, such as illustrations, bindings, and the design, colour, and ornamentation of the types. One of my main goals was to use locally available resources for the formal analyses, as handling and reading the material books is important in understanding their artistic qualities and, to an extent, the experience of their original readership. However, solely using items from local collections proved to be more challenging than anticipated. This limitation was not for lack of comprehensive collections, but because Pre-Raphaelite book arts is an ambiguous category often pertaining to books published outside of the official period of the Pre-Raphaelite Brotherhood. The available resources shaped the exhibition and, thus, Dante Gabriel Rossetti became more of a focus than the other founding members of the Pre-Raphaelite Brotherhood.

Dante Gabriel Rossetti illustrated his sister Christina Rossetti's 1862 collection of poems, "Goblin Market and Other Poems" and went on to design both the illustrations and binding for "The Prince's Progress and Other Poems," another sibling collaboration from 1866. These two publications were central to the illustration and binding categories in the exhibition. In these sections, I analyzed the stylistic similarities between Rossetti's illustrations and his paintings, as well as his philosophies of design and illustration.

The exhibition's typography and typeface sections were represented by "Recuyell of the Historyes of Troye," printed by William Morris's Kelmscott Press project in 1892. While William Morris—and the Kelmscott Press in particular—operated decades after the official Pre-Raphaelite Brotherhood's disbandment, "Recuyell of the Historyes of Troye" is an important link between the Pre-Raphaelite Brotherhood and the legacy of their design philosophies in terms of book production. Like the earlier PRB, Morris' new interdisciplinary practice addressed the conditions of contemporary life by conveying a moral message while also providing a sense of escapism, particularly from modern industrialization and mass production. Morris created designs and crafted objects in consideration of multi-sensory properties and aesthetic beauty. The Kelmscott Press employed a combination of handicraft and mechanized labour characteristic of the contemporary conditions of tactile production at the end of the nineteenth century.

Finally, an illustrated 1857 edition of Alfred Tennyson's poems—known colloquially as the "Moxon Tennyson" because of its publisher Edward Moxon—represented the collaboration between the three founding members of the Pre-Raphaelite Brotherhood (William Holman Hunt, John Everett Millais, and Dante Gabriel Rossetti) as well as the manifestation of the group's tenets in a singular publication. I argued that the illustrations in this book are not subservient to text and vice-versa. Rather, the PRB contributors undertook paratextual readings and created illustrations based on their impressions. Careful and conscientious craftsmanship is practiced by every agent of production, and each element contributes to a unified art object (the book). There were no copies of the Moxon Tennyson available locally,

and a full digitization was not readily available online either. However, extensive scholarship about the Moxon Tennyson's illustrations meant that high-resolution images were available in several GLAM institution's digital collections. Every section of the exhibition featured introductions to the individual Pre-Raphaelite members and further context about the sensory and social role of books in the Victorian period.

Digital exhibitions increase access to collections and facilitate connections between them and their respective host institutions. However, one's choice of institution also influences the direction of the research, as I discovered. My choice of materials was flexible due to the nature of the project, but collection bias is an important consideration for all digital exhibitions. Does the widespread accessibility of digital exhibitions necessitate comprehensiveness? If this is the case, are DH projects ever truly finished? Undergraduate education may provide a model in response to such questions, particularly because undergraduate students are accustomed to syllabi with a rationalized and limited scope. Setting research parameters already demonstrates some level of bias, and undergraduate level research is often contained within manageable parameters. However, as non-specialized early researchers, undergraduate students are also accustomed to thinking across boundaries. Consequently, they can provide interdisciplinary perspectives that are imperative to collaborative—and often innovative—digital projects.

One of the major benefits of using Omeka (or a similar platform) is that digital exhibitions offer more dynamic and interactive options for rare materials compared to physical exhibitions. Static displays limit interaction with rare books, objects that are meant to be held and contemplated but are simultaneously fragile and require conservation considerations. In physical exhibitions, a label may only pertain to a page of a book with no visual interest and viewers are unable to flip through and browse the book's contents. With Omeka, I was able to display several angles of the books at once (such as the bindings simultaneously visible verso, recto, and by the spine) and make comparisons between different artifacts. In many templates, viewers are also able to navigate the exhibition through a list of headings and subheadings for each section. These headings indicate the user's place in relation to the exhibition's narrative and their movement through the digital exhibition space.

Perhaps one of Omeka's biggest benefits is the accessibility and availability of this resource to students. Opportunities to curate physical exhibitions are not always available to students, and Omeka provides a platform to disseminate research in a creative format and make both curatorial and scholarly decisions. Putting together a digital exhibition raises questions about what information is absolutely essential to the narrative and what visual content best illustrates its central points. This visual content will not always be physically or even digitally available, so creative solutions and critical editing is often necessary as the exhibition comes together.

This project gave me an opportunity to gain new insights and practical skills. Working in collaboration with libraries and archives shed light on the processes of digital curation, transmission, and the human agents whose labor is essential—though often invisible—in these processes. I improved my research and writing abilities but also gained less expected skills (at least for an art history undergraduate) such as metadata entry. By default, Omeka uses the Dublin Core metadata standard. Juliet Hardesty notes that Dublin Core is not ideal for book collections because of the standard's limited bibliographic description capabilities (Hardesty 2014, 79). However, Dublin Core was sufficient for my project since I was a metadata novice and also wrote extensive descriptions in my exhibition text. Metadata entry was one of the most challenging parts of this process and continues to challenge me, but if nothing else it has given me a new way to think about and search for the materials I use in libraries, archives, and museums. Many museums and galleries (that I have worked for and/or encountered online) have non-standard catalogue entries and collection fields, so I appreciate these attempts at standardization, even if it is more challenging than anticipated to uniformly describe material.

In addition to bringing physical objects into a digital space, metadata fields also gave me a better understanding of media mediation. Some of the objects in the exhibition had complicated histories: for example, one artifact was a scan of a painting based on a drawing in a book. Without metadata, I would not have investigated these various layers of mediation or considered how it affected the image in its most recent iteration. Rendering a three-dimensional object in two-dimensional space raised even more questions about mediation. Illustrations were

simple enough to scan or photograph, but it proved more difficult to convey the materiality of a stamped binding that encases a three-dimensional book. These are just a few examples of creative solutions that were necessary in the process of curating an Omeka exhibition, and this conceptualization of physical vs. digital materiality is now an enduring consideration in my work. Notably, I also seek opportunities for collaboration as a result of this project.

Licastro, Rogers, and Savonick write that creativity is crucial to collaboration, in the representation of something new and beautiful, and in the creation of new insights and conversations within a field (2020). Undergraduate students are affiliated with their own universities but not necessarily GLAM institutions. For this reason, collaboration is absolutely necessary in student-researched and curated exhibitions. Most works are only seen on slides in art history classes. The Omeka exhibition format not only allowed me to think about my research in new ways (i.e. how to convey meaning through label-length write-ups and images rather than an essay) but the project also necessitated visits to my university's archives and special collections to handle real, material objects. This process made my research tangible and also exposed me to the breadth of the university's unique holdings. Exploring other Omeka exhibitions also revealed the extensive GLAM collaborations for other DH projects. Fieldwork within libraries, material analysis, and digital remediation are especially collaborative because each step involves several agents. Collaboration challenges the notion of single authorship and, likewise, digital projects involve additional steps and, thus, voices, compared to traditional research (Licastro, Rogers, and Savonick 2020).

There are mutual benefits to student-GLAM collaboration. Exploring physical collections, handling materials, and digitizing them for online display are all valuable skills that can be carried forward in future projects. My work within archives and special collections also made visible the often *invisible* labor that happens within GLAM institutions. From processing new donations to digitizing materials, witnessing this work first-hand immediately challenged my assumptions about the labor that goes into acquiring, maintaining, and digitizing collections. As mentioned,

many students expect to find entire collections online. Witnessing this labor—and undertaking a small portion of it myself—reminded me that this access is a privilege. Likewise, inaccessibility to online collections does not equate to an institution's apathy but, rather, practical constraints like time and funding. Student DH projects can provide digital access to collections regardless of these constraints.

The extent of my collaboration with GLAM institutions was limited compared to larger-scale DH projects. However, it still shaped my research in method and in practice. The ETCL facilitated this project by providing guidance and directing me to relevant resources and people within the UVic library. I was supported as a serious researcher in the ETCL through these resources. I was given a one-on-one Omeka tutorial and had an opportunity to present my progress at an open house. The project itself required visits to archives and special collections where I met with staff, explored the holdings, and handled materials. This project also led to further opportunities for collaboration, such as a presentation at the SFU-UVic Digital Pedagogy Network Student Digital Showcase in November 2018. At this venue, I was also able to learn from other students who had completed DH projects, some of which also required collaboration with GLAM institutions. I was able to create a whole new list of considerations from the presentations at this showcase, such as the importance of accommodating those with accessibility needs (i.e. describing images for screen readers) and optimizing exhibitions and other DH projects for mobile devices. Undergraduate student-GLAM institution collaboration is important for many reasons, but it is worthwhile for this reason alone: it leads to further collaboration.

The questions posed at the beginning of this article related to the place of students in the collaborative network of DH projects and the benefits of their contributions to these projects. I have briefly discussed the content of my Omeka exhibition, the skills acquired in the process of creating it and, most importantly, the collaboration necessary in its production. While undergraduate students are somewhat displaced from the categories of academic, non-academic, and professional sectors that often collaborate on DH projects, their mobility between and beyond these sectors is also

an asset. My project was customizable based on my interests, and it was shaped by available resources rather than policies. I was able to consult faculty members about research content, librarians and archivists about collections, and researchers involved with the Digital Humanities about web tools.

This Pre-Raphaelite book arts exhibition is hosted through the UVic Libraries server and has been disseminated in various other venues. Student mobility equates to knowledge and research mobility. This mobility is only made possible by institutional support, such as the availability of collections to research, and experts to pass on their knowledge about tools like Omeka. This case-study is specific to student-led projects *outside* of the classroom, but projects that begin in the classroom often lead to new avenues of inquiry as well. Linda Rath writes that Omeka is a meeting place where “...Librarians can be model practitioners facilitating intersections and collaborations between digital humanists...” and that by “...Using a librarian-led DH approach, the Omeka.net Web-publishing platform establishes online exhibitions and content as a DH meeting place” (2016, 171). I would like to expand this idea further. Omeka is a dynamic tool and certainly a cross-disciplinary meeting place. However, I believe that students who work on DH projects with librarians, digital humanists, and other experts truly stand at the intersections of collaboration. Their mobility between academic, non-academic, and professional categories facilitates true collaboration, and by learning best practices from various agents, student may become model practitioners themselves.

Acknowledgements

I would like to acknowledge the Electronic Textual Cultures Lab at the University of Victoria for their ongoing support with this project. Randa El-Khatib, in particular, was a great help as the coordinator of the Open Knowledge Practicum. Dr. Matt Huculak, Digital Scholarship Librarian at the University of Victoria, taught me everything I know about Omeka and put me in touch with the organizers of the SFU-UVic Student Digital Showcase. I am grateful for his mentorship. I would also like to acknowledge the enthusiastic help offered by everyone in Special Collections & Archives at UVic: Heather Dean, Lara Wilson, Jane Morrison, Jaqui Thompson, Lawrence Hong, and John Frederick. It was a pleasure working with this team during my time there.

Finally, I would like to extend a heartfelt thanks to the editorial team of this special edition: Colette Colligan, Michelle Levy, Kandice Sharren, and Kim O'Donnell. I am grateful to have this opportunity to share my experiences as an undergraduate student. The exhibition discussed throughout the article can be found here (see UVic 2020): <http://omeka.library.uvic.ca/exhibits/show/beauty>.

Competing interests

The author has no competing interests to declare.

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Response: Digital Pedagogy Initiatives in the GLAM Sector

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As academic librarians working to advance library engagement with digital scholarship we are pleased to reflect on this cluster of papers articulating the benefits and challenges of engaging galleries, libraries, archives and museums (GLAM) as digital scholarship teaching partners. Dowson and Goddard both manage spaces and programs within the cultural heritage sector that connect students with rare and unique holdings, enable emerging forms of knowledge mobilization, and open GLAM collections and platforms to student contributions. Opportunities for libraries and archives to work directly with students are often generated through teaching partnerships with faculty members. Librarians and instructors can work together to develop class assignments that are explicitly intended to develop digital publishing, classification, and curation skills.

Developing professional skills in the areas of digitization and curation is a key benefit to students in their collaboration with GLAM institutions. Each paper in this cluster discussed the skills developed as the student authors applied professional standards to describe special collections, and used digital publishing platforms to mobilize their research. In their paper “Opportunities for Learning: Collaboration between Information Studies Students and GLAMs” Donna Langille, Christina Hilburger and Melissa Nelson discuss their collaboration with the Redpath Museum on a digitization project that allowed them to test and implement theoretical concepts introduced during their Digital Curation course. The museum did not have on-site digital scholarship expertise, so the students had to design their own curation process. The students gained valuable professional experience, and Redpath gained a digital exhibit to help with outreach efforts, and to offer global access to museum collections. Alessandra Bordini and Josie Ann Greenhill were also

fully embedded in the curation processes on their respective projects. In Bordini's paper, "Metadata Challenges and Solutions: Describing and Contextualizing SFU's Wosk-McDonald Aldine Collection Online" the author reflects on the importance of enabling student researchers access to a wide variety of professional expertise and institutional infrastructure in support of building collections and digital experiences relevant to the needs of researchers, GLAMs and the broader public. She also highlights the crucial role the student researcher brings as subject expert to these collaborations. Greenhill's paper, "Digital Humanities Projects in Collaboration with GLAM Institutions: A Student Perspective" builds on the role of student curator as she describes her work building an Omeka exhibit focused on Pre-Raphaelite artistic practice. Greenhill's project experimented with digital forms of knowledge mobilization and the need to balance user needs against professional standards for description and preservation. This negotiation between long-term access and preservation and emerging forms of knowledge production is an ongoing discussion in the GLAM community. Considering how best to remediate the materiality of objects while creating digital surrogates invites students to think critically about the process of knowledge creation in print and online and encourages them to consider ways of representing information for their potential audiences. These types of pedagogical collaborations are mutually beneficial as students offer GLAM institutions an opportunity to view their existing holdings through the lens of a user, facilitating increased understanding of the obstacles that students may encounter when undertaking research with rare collections. These case studies explore themes of open scholarship, collection description, digital preservation, and virtual spaces that facilitate collaboration, a reflection of current and emerging trends in the ways that GLAM institutions are involved with digital pedagogy.

Open scholarship

In each of these three case studies, students chose to work with rare and unique materials from Special Collections in Libraries and Museums. Modern print collections in libraries are becoming increasingly homogenized due to the subscription model wherein most institutions subscribe to the same large packages of journals and

ebooks. The most important material in research libraries is that which is globally rare or unique, most of which is held in Archives and Special Collections. These collections are also the most difficult to access, as they do not circulate, and are housed in secure spaces with limited hours. The same is true in galleries and museums, where the vast majority of the collections are not on display but are held in storage. Due to cataloguing backlogs in GLAM institutions a huge amount of that material is undescribed, so it cannot be discovered in online searches.

Each paper addresses the students' desire to work directly with unique objects housed within their local GLAM collections, and in all cases, students state a goal of providing broader access to the materials with which they are working. Langille, Hilburger, and Nelson point to the satisfaction of developing a project that provides their collaborator, the Redpath Museum, with a resource that showcases a portion of the unique and fragile seahorse collection to the greater public and scientists alike. Greenhill observes that students working on personal research projects are passionate about objects related to their research, and as novice researchers, may be able to bridge specialist and non-specialist interests in the institutions' collections. Bordini is challenged to create metadata that will be meaningful to a non-specialist audience. The students are engaging, explicitly or not, with a larger trend towards open scholarship. They share a growing belief that research and scholarship should reach beyond the academic audience to benefit broader communities. Digitization is one important way to provide global access to materials that would otherwise be limited to a rarified scholarly audience. Accessibility initiatives often generate secondary benefits, and in this case, they also make rare materials much more easily accessible for local research and teaching. Digitized collections underpin a great deal of pedagogy and research in the digital humanities, and GLAM collections are great candidates for student projects. The students gain valuable experience in digitization techniques, as they also help cultural memory institutions to bring to light their collections globally.

Metadata and description

While digitization is an important means of increasing access to valuable collections, digitized objects cannot easily be discovered, understood, or cited without the

addition of descriptive metadata. The creation of consistent, accurate, and complete metadata is a fundamental activity in GLAM institutions. Both Greenhill and Langille et al. struggled to fit descriptive information into the standard Dublin Core fields that are delivered with Omeka, with the latter group eventually being forced to create a metadata crosswalk to Darwin Core. Bordini, who used the more expressive MODS standard, had trouble knowing when to stop adding information. All groups commented that metadata creation was one of the most challenging and thought-provoking aspects of their work and that much of the labour in developing digital scholarly resources had been invisible to them prior to this experience. Each paper thus sought to demystify the workflow, emphasizing the extent and complexity of the tasks involved in creating digital collections, which is something that GLAM institutions struggle to convey to researchers.

As researchers develop collections of digital objects in the course of their projects, it is important that they also become familiar with metadata models and standardized description. This is an important emerging area in digital pedagogy, and one that humanities instructors are not always equipped to teach. Metadata is a fruitful area for teaching collaborations with library cataloguing experts. Although classification is always a fraught topic, the application of consistent, controlled description is a critical aspect of modern discovery systems from JSTOR to Wikipedia to Twitter. This is especially true when publishing music, images, video, and other non-text formats that don't lend themselves to basic keyword search. Considering how to describe an object requires nuanced considerations of audience, culture, language, and philosophy. Teaching collaborations with librarians can expose students to deep expertise in cataloguing and classification that they would not otherwise encounter outside of a graduate program in library science.

Research data management and digital preservation

The ability to preserve digital knowledge is one of the most pressing problems facing modern libraries, archives, galleries, and museums. A large portion of the world's information is now born-digital, and there is a genuine concern among librarians that early 21st century data, scholarship, and knowledge will not survive for the benefit of future generations. It is interesting to see that the student authors in this

cluster gave thought to the long-term accessibility and reusability of their digital work. Bordini suggests that providing public copies of the XML metadata files would benefit future researchers and help to make visible the underlying labour of the Aldine project. Langille et al. provided the Redpath Museum with the raw JPEG and TIFF files for long term digital preservation. This type of data management practice is something GLAM organization are well positioned to teach, however, it is outside the typical workflow for most humanities scholars. Now that major Canadian funding agencies are poised to mandate data management plans, emerging researchers need to acquire data curation skills. As students learn to plan and build digital research projects, they must also learn to consider the long-term sustainability of that scholarship.

As curation and preservation experts, GLAM professionals can work with faculty to develop learning opportunities that improve student skills in the areas of digital curation and preservation. These skills include the need to consider the life of the content or data beyond the life of the container or platform. The shiny front end of a digital project will likely not survive fifteen years, but the objects and structured data within the back-end database can be migrated, aggregated, and reused indefinitely if they are designed with future interoperability in mind. Although information professionals may seem a bit pedantic about the standardization of formats and descriptive metadata, these practices help determine whether a given research project can be impactful to future scholars, or whether it will disappear in a decade.

Virtual and physical spaces to enable collaboration

Finally, each paper in this cluster foregrounds the importance of developing a varied set of institutional structures open to students as part of their research and professional practice. Each paper explores a different model of bringing together student and GLAM expertise, including course-integrated projects, research assistant positions, and practicum positions within aligned research units. Bordini and Greenhill both built their projects on library-hosted infrastructure, and this is an important direction for GLAM collaborations in digital pedagogy. Academic departments lack the technical infrastructure to host student projects, and free online options are often quite limited, as Langille, Hilburger, and Nelson discovered

in their experience with Omeka.net. GLAMs generally run their own digital asset management and exhibit platforms. If GLAMs wish to enable students to publish and interpret our collections online, then it makes sense to remove barriers to participation by extending those platforms to individual students or entire classes.

Beyond the virtual entry point offered by digital publishing platforms, GLAM institutions are increasingly creating new spaces and positions that can help to connect students with collections and expertise. In all three papers the students indicated that help from librarians, archivists, and curators was critical to the success of their projects. This included help finding material in specialised collections, help using publishing and exhibit platforms, help understanding and applying metadata standards, and help with digital curation. Langille, Hilburger and Nelson point to a further opportunity for teaching opportunities around licensing and rights management. Bordini specifically mentions the importance of SFU's Digital Humanities Innovation Lab, housed in the SFU Library, as a place that helped connect her with library expertise. Greenhill conducted her project in The Electronic Textual Cultures Lab which is part of the Digital Scholarship Commons at UVic Libraries. These emerging spaces are a critical means for supporting digital research and teaching within libraries and archives. By building virtual and physical bridges to student participation, GLAM institutions can become key partners in digital pedagogy initiatives on campus.

Curation activities have traditionally been limited to internal processes in most GLAM organizations. The extent of these activities are dictated by available resources, professional expertise, and institutional priorities that tend to favour broad access over detailed description. Introducing meaningful opportunities to partner with students across the curation cycle will allow organizations to undertake a more varied set of collection development projects, which could highlight more niche materials, provide subject specialist expertise to new and existing collections, and undertake projects that were not possible within current resourcing. In addition to a formal credit on project outputs (papers, websites, etc.) and in recognition of the valuable expertise brought by student partners, these opportunities should provide students appropriate compensation in the form of paid labour or course

credit. There are many opportunities for faculty-GLAM teaching collaborations, and these pedagogical initiatives are beneficial to both students and to the partnering institutions.

Editorial contributions (for all articles and response)

Guest Editors, DSCN Student Issue 2020: Colette Colligan, Kimberly O'Donnell and Kandice Sharren.

Section Editor/Copy Editor: Darcy Tamayose, The Journal Incubator, University of Lethbridge, Canada.

Copy Editor/Bibliographies Manager: Shahina Parvin, The Journal Incubator, University of Lethbridge, Canada.

Competing interests

The authors have no competing interests to declare.

How to cite this article: Hilburger, Christina, Donna Langille, Melissa Nelson, Alessandra Bordini, Josie Ann Greenhill, Rebecca Dowson and Lisa Goddard. 2020. "Collaborating with GLAM Institutions." *Digital Studies/Le champ numérique* 11(1): 4, pp. 1–12. DOI: <https://doi.org/10.16995/dscn.377>

Submitted: 15 February 2020 **Accepted:** 26 March 2020 **Published:** 18 May 2021

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