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A Visual Workflow for Cataloging

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Description/Abstract

Our digital collections team took on the challenge to improve the tools and processes of cataloging. We began to explore how we could build features that helped students into a cataloging worksheet tool, under development at DressDiscover.org. After our initial development of the tool, we looked back and realized just how much Universal Design for Learning (UDL) had influenced our design, although we had not consciously intended that from the start. Our assessment of the project through a UDL lens was at first extremely affirming, helping us to note many ways that our work already supported all three of UDL's principles of multiple means of engagement, representation, and action and expression. Next, it helped us prioritize the implementation of certain improvements we already had in mind and to add further ideas for future development. Looking at the project from the perspective of UDL helped us to shift from seeing poor quality in catalog records as a deficit on the part of the cataloger to a lack of supportive functionality in cataloging systems and processes. With a UDL approach to the design of cataloging interfaces and processes, we can provide accommodations to catalogers who have formally disclosed disabilities as well as make the cataloging process more comfortable and productive for all, including those who may have invisible, undisclosed, or temporary disabilities, those who are new to the process, and those who have been doing it for years.

Keywords

Universal Design for Learning, User Interfaces, User Experience, Cataloging, Metadata, Digital Collections, Clothing

Disciplines

Library and Information Science

CHAPTER 15

A Visual Workflow for Cataloging

Arden Kirkland and Minor Gordon

Introduction: Who Can Be a Cataloger?

Novice catalogers begin with the same goal: to learn how to describe objects in a systematic way so that the information about them can be more easily found by researchers. Over years of teaching cataloging best practices, one of the authors has enjoyed watching students' progress. In class discussions or loosely structured exercises, students often provide insightful and detailed observations of resources to be cataloged. However, when those same students begin to work with the technical systems commonly used in cataloging, many express intense frustration. It is rare for the same students who excel at description to also enjoy the challenge of specific technical workflows. Even when they do, those insightful observations often don't make their way into the final catalog record, as catalogers shift their focus to the challenging system they're working with rather than the original goal of object description. These frustrating experiences dissuade student catalogers from considering professional cataloging work. As a result, our catalogs often lack representation from multiple perspectives, with a smaller volume of records created by a smaller number of people. Important keywords and other information may be missing, rendering objects invisible in the catalog when a researcher performs a search.

Our digital collections team took this as a challenge to improve the tools and processes of cataloging. One of us (Kirkland) specializes in metadata and educational use of collections, the other (Gordon) in software development. We began to explore how we could build features that helped students into a cataloging worksheet tool, under development at DressDiscover.org. This project unfolded in tandem with continued teaching about cataloging as well as teaching about teaching, including introducing emerging teaching librarians to the principles of Universal Design for Learning (UDL).[1] After our initial

development of the tool, we looked back and realized just how much UDL had influenced our design, although we had not consciously intended that from the start.

Our assessment of the project through a UDL lens was at first extremely affirming, helping us to note many ways that our work already supported all three of UDL's principles of multiple means of engagement, representation, and action and expression. Next, it helped us prioritize the implementation of certain improvements we already had in mind and to add further ideas for future development. Looking at the project from the perspective of UDL helped us to shift from seeing poor quality in catalog records as a deficit on the part of the cataloger to a lack of supportive functionality in cataloging systems and processes. This perspective also encouraged us to consider how many in our community, including students and colleagues, have invisible disabilities, affecting subtle aspects of cognitive function. When we find a topic like cataloging difficult to teach, UDL gives us a framework to examine concrete ways that we can make this learning more accessible for everyone.

The functionality we discuss in the sections to follow is for a broader audience than for people new to cataloging. Even experienced professional catalogers are still learners, whether they are keeping up to date with developments in the field or learning about the objects they are describing in catalog records. With a UDL approach to the design of cataloging interfaces and processes, we can provide accommodations to catalogers who have formally disclosed disabilities as well as make the cataloging process more comfortable and productive for all, including those who may have invisible, undisclosed, or temporary disabilities, those who are new to the process, and those who have been doing it for years.

A Tour of DressDiscover

DressDiscover[2] allows catalogers to describe historic clothing using images rather than text. While going through the worksheet, catalogers either examine the actual physical artifact, a printed image, or an image of it in another window or screen on their device. This approach could be used with a wider variety of artifacts collected by galleries, libraries, archives, and museums (GLAMs) or to better describe visual details in historic photographs.

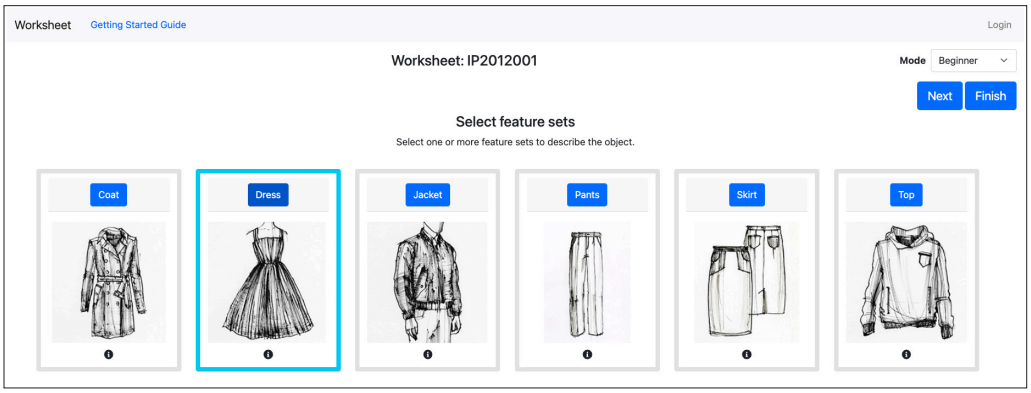

Figure 15.1. Screenshot from DressDiscover showing feature set choice, with the "dress" feature set selected. (Screenshot courtesy of the authors.)

DressDiscover follows the metaphor of a paper worksheet, with a series of screens of different features for different types of objects. When starting a new worksheet, you begin by choosing the type of object you're describing and clicking the image or label for that "feature set."

Feature sets correspond to types of objects ("Coat", "Dress") and recognize that, for example, a dress can be described in terms of color, closure, material, neckline, sleeve type, and so on. Once feature sets are selected, the next screen shows the full list of features available to describe the object ("Textile Materials", "Closure").

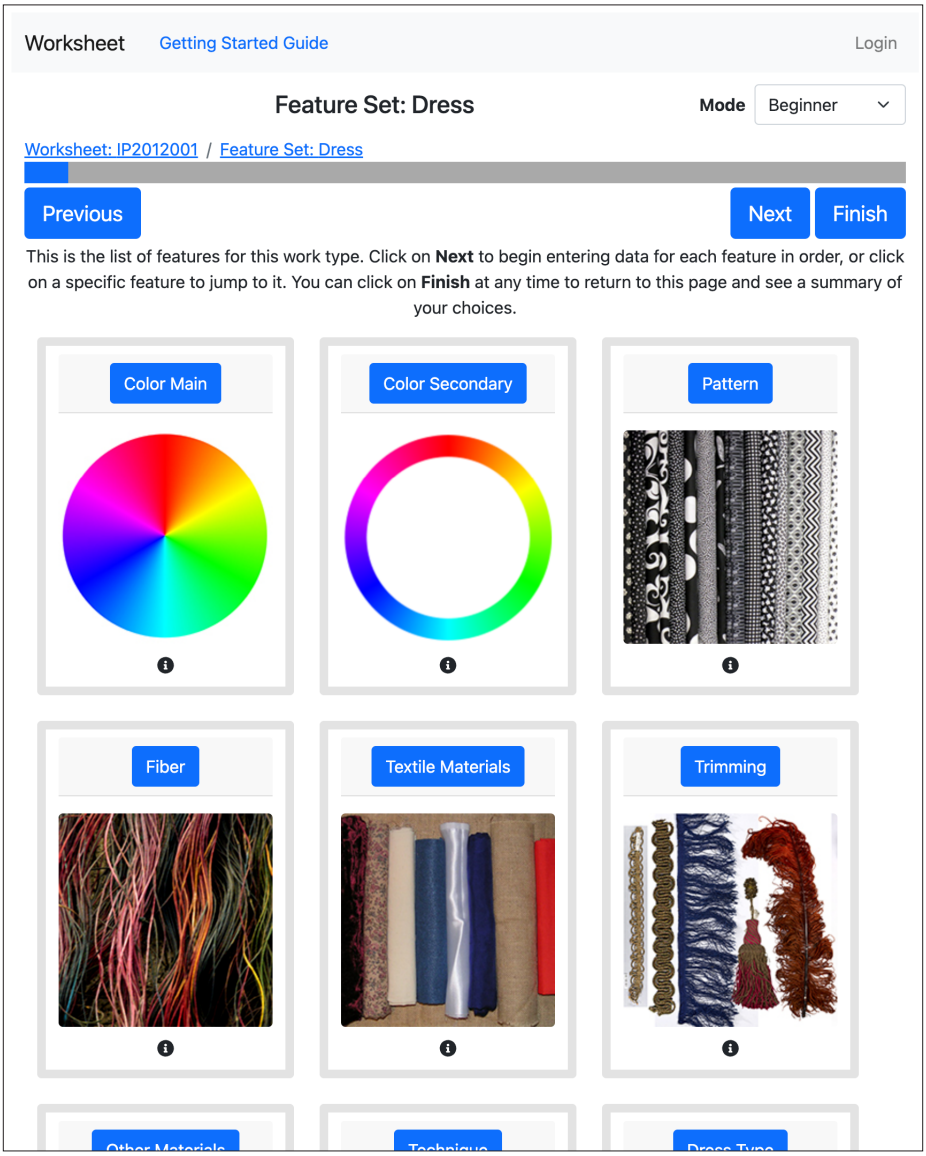

Figure 15.2. Screenshot from DressDiscover showing the overview of all features available within the dress feature set. (Screenshot courtesy of the authors.)

From this screen, you can either click on the "Next" button or click on the button for the feature you want to start with. The next series of screens are for each feature in order. A feature has one or more enumerated feature values ("Cotton", "Linen") shown as a grid of images. As this project is still a work in progress, we are still filling in all the images.

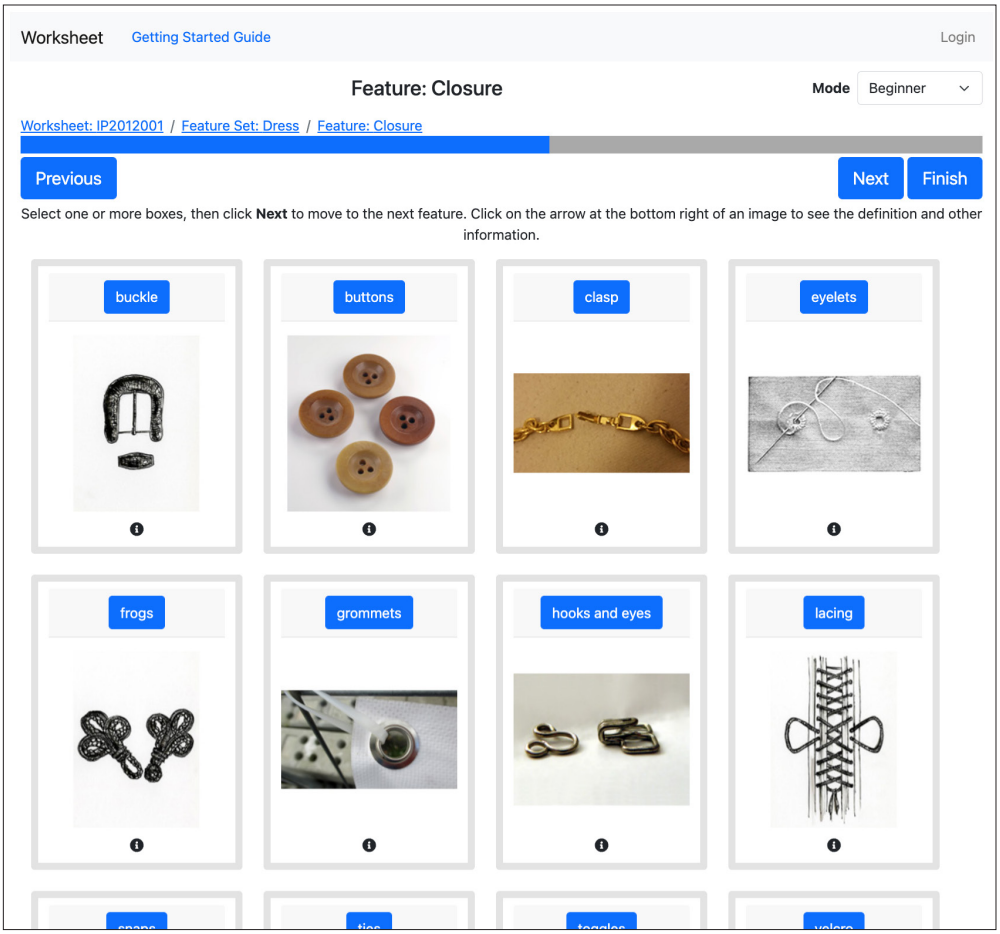

Figure 15.3. Screenshot from DressDiscover showing the grid of images that represent the feature value options for the "Closure" feature. (Screenshot courtesy of the authors.)

Select one or more boxes by clicking on the image. You can click on the "i" icon under each image to see an expanded view with a definition. Then you can click "Next" to move to the next feature. When you complete the final screen, you will be taken to the Review page (or you can skip to this at any time by clicking on "Finish"). If you want to edit any answers, click on the button of the feature you want to edit. After you've gone through all the grids, you can export the record to use the metadata in another context. It's designed to be platform agnostic and to work with other tools in a modular way. You have the option to log in with a Google Account and save your work to Google Sheets so you can access

it from a different computer or at a later time, but if you don't log in, the system will save your work within the browser you're using.

How Does it All Work?

DressDiscover is implemented as a web browser-based application. The application consists of a set of files (code, images, data) that are automatically downloaded into the user's web browser when the user visits the worksheet website. The application does not require a content management system such as WordPress or Drupal and does not depend on a hosted database such as MySQL. Worksheet contents can be saved to the user's browser on a single machine, shared between machines using Google Drive, or downloaded in a variety of formats. This design eliminates the hosting costs and security concerns associated with content management systems. The worksheet structure definition is loaded separately from the code for the application so that the structure can be redefined without changing the code.

The structure of a worksheet is defined hierarchically in terms of the feature sets, features, and feature values discussed above. DressDiscover builds on the work of another project called Costume Core,[3] which provides an application profile for metadata for historic clothing, incorporating existing standards, including Dublin Core,[4] VRA Core,[5] Cataloguing Cultural Objects,[6] the Art and Architecture Thesaurus,[7] and the Europeana Fashion Thesaurus.[8]

UDL's Implications for Cataloging Interfaces

All three of the main principles of UDL have influenced the design of DressDiscover: multiple means of engagement, representation, and action and expression. These three are presented in the UDL guidelines[9] with several checkpoints in sub-sections under each principle. The sections that follow are organized to discuss our application of individual checkpoints, beginning with those that were most influential at the beginning of our work and showing how they relate to each other and led to our continual improvements and future plans.

Guide information processing and visualization (checkpoint 3.3) and Support planning and strategy development (checkpoint 6.2)

As introduced briefly above, DressDiscover provides a structured workflow to lead catalogers in a sequential way to engage with cultural artifacts by examining multiple features in detail. This sequential approach relates to both the representation and action and expression principles of UDL: each step provides resources to help with catalogers' perception and comprehension, followed by the opportunity for them to act and express their decision-making. These sequential design choices contrast with many traditional cataloging systems, which present all description fields for an object on a single screen and often in an order that does not match logically with the order in which a cataloger proceeds

when first examining an object. Elements of description in cataloging interfaces (called *features* in DressDiscover's conceptual model, but analogous to database fields in other systems) may be presented in alphabetical order or numeric order (for numbered fields in standards like MARC) rather than an order that is logical for the cataloger's workflow for that particular object type. Even when elements in a cataloging interface are in an order that will be logical to display to end users, this may be very different from the order that is logical for a cataloger's workflow.

This sequential approach within DressDiscover encourages "close reading" of artifacts, influenced by methodology provided by Prown[10] for studying material culture. DressDiscover focuses on the first of Prown's steps, *description*, which "is restricted to what can be observed in the object itself."[11] This includes substantial analysis (physical description such as dimensions or materials), content (including iconography present in design motifs), and formal analysis (of features such as color, line, and texture).

The order of features in DressDiscover is also based on the first author's (Kirkland's) years of experimentation with different methods for training student catalogers to describe objects in the study collection of historic clothing maintained within the Drama Department at Vassar College. In 2010, the collection benefitted from a National Endowment for the Humanities Preservation Assistance Grant for Smaller Institutions[12] to host a series of workshops with professionals from the field to teach students, faculty, and staff about best practices for describing and preserving historic clothing. Following the practice (at that time) of several major costume museums, students were provided with simple paper worksheets to enter some basic data about the object, such as an ID number and designer/maker name (if known), along with a description. Jessa Krick taught students the method she had used while working on documenting the Brooklyn Museum's costume collection. This method was to describe objects in a single free-text description, first considering the object as a whole, then considering individual parts, generally using a top-down (neckline to hem) and outside-in (trimming to lining) approach. However, when reviewing student descriptions created in this way, many important details were missing.

To improve this process, Kirkland turned the paper worksheet into a more detailed form, with each piece of data presented in a specific sequence so that catalogers were reminded of exactly which features they should consider including in an order that was logical when examining the object. The change helped, but often students weren't sure of the correct vocabulary to describe what they were seeing. Looking up terms in fashion dictionaries like Fairchild's[13] was not helpful since the students would have to know the term first in order to look it up. However, several helpful resources were found online, including the *Fashion Terms and Styles for Women's Garments* provided by the Oregon State University Extension Service,[14] which showed relevant terms in groups of simple illustrations. These were printed out and put in a binder of reference materials for students. The quality of the records improved greatly, but the process for students was still cumbersome and required lengthy training: flip page by page through the reference materials, handwrite data on the worksheet, then type it all into the collection database. Thus, the idea for DressDiscover was born: to incorporate all of this into a digital application, make the process as seamless and efficient as possible, and support vocabulary acquisition along the way.

In bringing this method from the paper worksheet to a digital interface, we recognized how important it is for cataloging interfaces to have options for ordering fields in different ways for different types of objects or different workflows. For traditional bibliographic cataloging, RDA tells us to record what the resource tells us about itself, looking at the title page to transcribe the title, statement of responsibility, or publication information. For texts, a logical order in the interface would have these fields at the top. For many objects in special collections, however, there may be no such text available on the object itself. More commonly, such objects can only be represented in traditional catalogs through observation of stylistic details, which can then be used to form educated estimates of dates or regions. Therefore, the description of such stylistic details should appear first in the cataloging interface. This sequential way of recording features of the object can help avoid fields being skipped, and by avoiding such errors of omission, we're more likely to render the object "find-able" to researchers through the catalog. Notably, two UDL checkpoints are addressed here, falling under both multiple means of representation and multiple means of action and expression (checkpoints 3.3 and 6.2). The structure of DressDiscover represents a particular sequential approach to guide catalogers, in a logical order, to be more thorough. This then supports the cataloger's own executive function when it comes to their actions, with a strategic approach for them to enter quality data, resulting in better catalog records for everyone to search.

Highlight patterns, critical features, big ideas, and relationships (checkpoint 3.2)

In addition to a sequential approach, careful grouping of steps in the workflow can also help catalogers. The feature sets in DressDiscover correspond with work types and establish which elements of description will apply to a particular object or not: when a cataloger indicates they are describing a skirt, they will not be presented with an option to describe its sleeve type.

The presence of many irrelevant fields can be a burden to catalogers both in terms of the cognitive function of having to decide what to skip but also in terms of the repetitive physical stress of continuous scrolling through them or hearing them read through a screen reader. In some other systems, this is avoided by using a tabbed design for grouping related features, allowing catalogers to click on each tab as needed and skip tabs that aren't relevant to the item at hand. In Pauman Budanović and Žumer's 2021 usability study, *Prototype Cataloging Interface Based on the IFLA Library Reference Model (LRM)*, one participant noted that the tabbed design helped catalogers avoid entering irrelevant values in error.[15] DressDiscover takes this even further and only presents certain grids of feature options based on the choice earlier in the process of the type of object being described.

When features are grouped, this reminds catalogers what features are important to look for in specific object types. Of course, this can also help novice catalogers learn what features are important to look for in the first place. But even for catalogers with more experience or expertise, structural features in the interface to help avoid ambiguity can be meaningful.

When teaching or hiring catalogers, certain dispositions may be explicitly preferred. The "Core Competencies for Cataloging and Metadata Professional Librarians," identified in 2017, includes many "Behavioral Competencies" in section 3, including the ability to "Sustain attention to detail" and "Think critically"[16] (under Problem solving). These also indicate that catalogers should demonstrate "Flexibility," "Comfort with ambiguity," and "Independence" (under Initiative & adaptability).[17] Unfortunately, some of these may be a point of tension for librarians with invisible disabilities related to mental health and cognition. For example, ambiguity in work processes can be problematic for someone with an anxiety disorder. In Oud's study, *Systemic Workplace Barriers for Academic Librarians with Disabilities*, "a few participants with mental health-related disabilities reported that the conflict and stress created by ambiguity and lack of clear priorities at work made it challenging for them to cope at work or contributed to the worsening of their disability."[18] By providing steps in a relevant order, with clearly grouped options to choose from at each step, DressDiscover tries to diminish ambiguity and clarify priorities, removing those cognitive burdens as much as possible.

Minimize threats and distractions (checkpoint 7.3)

Even catalogers with the best "attention to detail" have bad days or distracted moments. In addition, some people who don't have the best attention to detail, or other characteristics valued in cataloging, may have other advantages that are missed in an exclusive cataloging process. In the same study of workplace barriers, Oud also found that "people mentioned a wide variety of ways that they felt their disabilities helped them in their jobs, including increased empathy for others, being more patient and understanding supervisors, the ability to bring their experiences with and knowledge of disability to improve job responsibilities like reference and instruction, and the ability to think creatively and strategically."[19] We have observed creative, critical-thinking students who engage in meaningful discussions about the impact of cataloging but are turned off by the technical workflows. This filtering of the potential cataloging workforce results in an impactful lack of diversity.

Sequential and carefully grouped cataloging interfaces, as implemented in DressDiscover, can simplify the process in a way that helps minimize distractions. For example, the visual appeal of many historic garments can easily distract student catalogers: when writing a free-text description as mentioned above, they would include a few features that caught their attention but leave many others out. In contrast, the step-by-step approach in DressDiscover is designed to help them stay focused and make sure they consider all important features.

Clarify syntax and structure (checkpoint 2.2)

Most cataloging policies include the use of controlled vocabularies so that catalogers must choose preferred terms from a particular list or thesaurus to ensure consistency. However, searching for a single appropriate term in an entire complex thesaurus can be daunting, especially for the novice cataloger. Some systems provide functionality to choose terms from a drop-down list or use autosuggest to see terms suggested as you start typing. Both of these can generally help with misspellings or other uncertainty, but

considering that there were 362,484 authorized headings in the 2021 edition of the Library of Congress Subject Headings, a single dropdown or search box, even with autosuggest, can be unwieldy.[20]

For tasks involving choosing terms from predefined options, participants in Pauman Budanović and Žumer's 2021 cataloging interface usability study preferred the option showing multiple terms in a columnar layout with checkboxes over a dropdown list with all options displayed vertically, largely because this did not require as much scrolling (both a cognitive and physical repetitive task), and allowed them to choose multiple values in one step.[21] The grid layout in DressDiscover follows this approach, trying to fit as much as possible on a single desktop screen.

Some thesauri have a hierarchical structure, with related terms grouped, but this can be very complex. For costume history, many relevant terms can be found in the Art and Architecture Thesaurus (AAT), but related terms need to be collected from many different parts of the AAT hierarchy and re-grouped to make them more accessible. To help with this, DressDiscover follows up on Marcia Lei Zeng's guidance for collecting "micro thesauri" from the Getty Vocabularies (including the AAT).[22] When going step-by-step through each feature, the options presented as possible values are more concise groupings of terms related to specific features. Such re-grouping of terms can also help to mitigate issues with different perspectives of terms over time and in different cultures. For example, the Vocabulary of Basic Terms for Cataloguing Costume developed by the International Council of Museums Costume Committee[23] is classified by gender and life stage at the top level so that a cataloger's first choice before they can even find appropriate terms is whether a garment is for a woman, a man, or an infant. Similarly, "museums like the V&A and the Met historically drew a distinction between textiles that were considered Fashion and textiles that were considered ethnographic art."[24] Having gender or culture as a top-level choice limits understanding of cross-gender or cross-cultural features across time. DressDiscover, using the structure established by Costume Core,[25] approaches factors like gender, life stage, culture, function, and more as facets rather than in a hierarchical way. This helps catalogers and researchers alike to see common details across many different kinds of objects rather than hiding them from view based on a top-level classification. These facets are also strongly influenced by the ways in which people may shop for their own clothing online (checkpoint 7.2, optimize relevance, value, and authenticity) using e-commerce filters for choices not only of object type but also details like color and material.

Illustrate through multiple media (checkpoint 2.5)

The sequential and carefully "chunked" workflow of DressDiscover all lead to what is perhaps the most important functionality of all in terms of improving accessibility: taking the complicated vocabulary of a very specific domain and representing terms as text along with images. The goal of this approach is to mitigate disagreements over preferred terms or lack of knowledge of advanced vocabulary. Catalogers who might call the same thing by a different name can see from the image that they're talking about the same concept, regardless of semantics.

Some authority databases are making strides to add visual resources to their records to help users understand terms. Nomenclature for Museum Cataloging,[26] a widely used system for controlled vocabulary and classification of museum objects across North America, has incorporated illustrations for some terms from the Parks Canada Descriptive and Visual Dictionary of Objects. However, so far these illustrations only appear once one has already found their way to a term through text-based navigation. Instead, DressDiscover provides illustrations earlier in the process to help someone find appropriate terms in the first place (as shown previously in figure 15.3). As more images are added to Nomenclature and Wikidata, that provides more potential for software developers to add functionality for visual learners. For example, in the same way that many applications now offer options to see a definition of a word when you hover over it or right-click on it, this could show an image from one of these sources instead (or in addition).

Our focus so far has been on providing visuals, but another step for us will be to test DressDiscover on different devices with different settings for speech-to-text, text-to-speech, and full screen reader functionality (checkpoint 1.3, offer alternatives for visual information). The use of speech-to-text functions can provide a partially hands-free cataloging approach, helpful both for hand or wrist limitations and for working directly with museum objects while wearing gloves and not having to take them off so often to type (checkpoint 4.2, vary the methods for response and navigation, and checkpoint 4.1, optimize access to tools and assistive technologies). Applying these approaches proactively for all instead of reactively for some could potentially prevent catalogers from developing issues over time related to the repetitive tasks of cataloging, including eyestrain, wrist or hand fatigue from using a keyboard and mouse, or stress-related impact on cognitive or executive function.

Clarify vocabulary and symbols (checkpoint 2.1)

Clarification of specialized vocabulary is important: when viewing each screen with a grid of images for feature options in DressDiscover, each image can be expanded to show a definition. Costume vocabulary varies widely across periods, regions, and cultures and what vocabulary terms can be used to describe features. Images are chosen as exemplars, but some terms may cover a wider scope than the single image shown so the definition can provide clarification.

This can be helpful for catalogers who are generalists and cannot be expected to have expertise about the wide range of materials they cover. Even for those who are subject matter experts, in the very specialized field of costume history, catalogers may have expertise in one region or time period but not others. Of course, this feature is most helpful for students and volunteers. Involving them in the cataloging process is not only a workaround when professional catalogers are not available but may also be desirable as a way of teaching them about the objects and engaging them with collections, particularly special collections with rare or unique objects. Another aspect that could provide even further clarity would be to take advantage of our use of linked data URIs to link not only to definitions of terms but also to lists of resources that have applied these terms in their records to better appreciate the context of widespread usage of terms (checkpoint 3.1, activate or supply background knowledge).

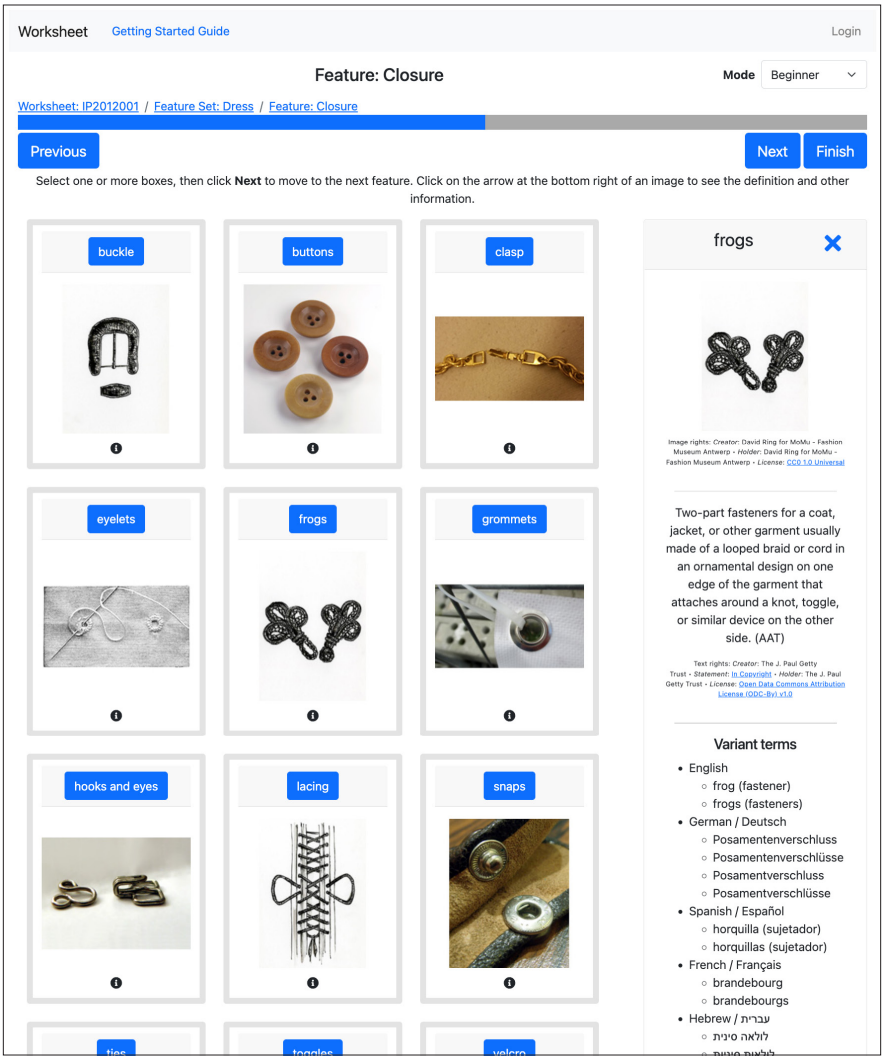

Figure 15.4. Screenshot from DressDiscover showing a detail view of "frogs" appearing on the right after the "i" icon under "frogs" in the grid was clicked, with rights information, a definition, and variant terms in multiple languages. (Screenshot courtesy of the authors.)

Another way that we hope to make DressDiscover help with cross-cultural understanding is through the inclusion of synonyms for different vocabulary terms. In costume history, as in many other areas, the most popular "preferred" terms for concepts may have changed over time or may differ among cultural groups. In the current DressDiscover interface, a single preferred term from American English is displayed above each image, but the expanded view for a single value lists variant terms (synonyms) where available from the AAT, including those that have been translated into many different languages. While the inclusion of images on its own can help transcend language barriers,

the inclusion of terms in other languages provides the potential that in a future version the interface could display the preferred term that matches best based on the language the cataloger has indicated in their browser settings (checkpoint 2.4, promote understanding across languages, and checkpoint 1.1, offer ways of customizing the display of information). Catalogers (or institutions) could even have the option to choose a different term from all those available to use in the output or even the display.

Other options for personalized settings could improve the experience for the needs of different catalogers. In fact, "people with disabilities have a unique role to play in design because they are particularly vulnerable to inflexible, 'one-size-fits-all' solutions; they represent the edge of variability within the population. When people with disabilities have difficulty in a designed environment, it is often a sign that others without disabilities are also having difficulty, though it may not be readily apparent."[27] For example, options for visual guidance in the form of shapes, colors, or blocks can help with clarification. Participants of Pauman Budanović and Žumer's 2021 cataloging interface usability study thought that color coding of tabs would help with easier identification of entities.[28] One participant even went so far as to say, "Everything is better than having black text on the white background, it hurts our eyes."[29]As is fitting with UDL's approach to multiple options for learners, study participants thought that catalogers should have options for setting their preferences for this use of color via system settings, an approach we may add to DressDiscover in the future.

Build fluencies with graduated levels of support for practice and performance (checkpoint 5.3)

This attention to the connection between preferred term, variant terms, translated terms, and image is intended to help catalogers with vocabulary acquisition and to improve both their cataloging skills and subject matter expertise over time. The more time spent practicing with this app's workflow should result not only in familiarity with this interface but also familiarity with the terms themselves, functioning as a constructivist teaching tool.

The inclusion of definitions and variant terms could be seen as a scaffold for this language acquisition but may not be needed over time as catalogers gain expertise. For this reason, DressDiscover provides three options for users: the default "Beginner" grid display of images with one page for each feature; an "Intermediate" layout with all values as more condensed text buttons but still the option to expand to see an image, definition, and synonyms; or an even more condensed "Advanced" view that lists all the features on a single page, with dropdown values for each. Such options for different displays can support the process for cataloging training, gradually removing scaffolds as expertise is gained. Systems designed for an "average" cataloger, particularly if they presume formal education or professional development about cataloging, put the burden on catalogers who are not average, in whatever way, to learn how to use it. Instead, systems should provide variable workflows and user interfaces that support a wider range of both contribution and use.

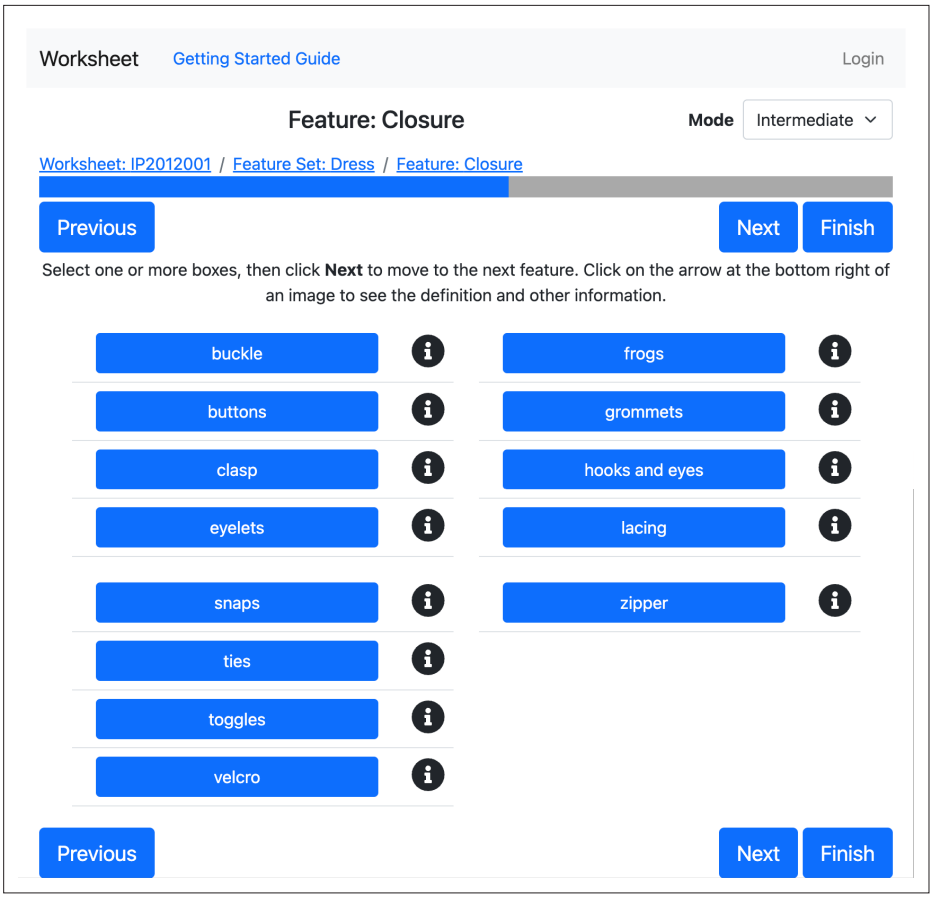

Figure 15.5. Screenshot from DressDiscover showing the "Intermediate" view option, with more condensed buttons for terms, for advanced catalogers who don't need to see images of the options. (Screenshot courtesy of the authors.)

This is important for professional catalogers to consider, as even those in entry-level cataloging positions are often expected to "train and supervise paraprofessional, student, and volunteer staff members."[30] Many institutions don't have resources to budget for experienced catalogers or for catalogers to spend much time on any individual record. Without additional help from students or volunteers, this can result either in a large backlog of un-cataloged materials or minimal records created using the "more product, less process" (MPLP) approach popularized by Greene and Meissner.[31]

Vary demands and resources to optimize challenge (checkpoint 8.2)

Different catalogers will come to the process with different motivations for the tasks at hand. Paid catalogers may have extrinsic motivation, but volunteers, including students,

need some form of intrinsic motivation built into the process itself. Division of the workflow into different sequential parts not only improves the process for a cataloger going through all the steps in order but also makes it possible to divide the process among different people, or have them do different parts at different times, to keep the level of difficulty appropriate to each person's ability and interest, supporting growth over time. As pointed out by Csikszentmihalyi,

> Optimal experiences usually involve a fine balance between one's ability to act, and the available opportunities for action. If challenges are too high one gets frustrated, then worried, and eventually anxious. If challenges are too low relative to one's skills one gets relaxed, then bored. If both challenges and skills are perceived to be low, one gets to feel apathetic.[32]

Even for work with professional catalogers, or any other "captive" audience, there is much to be learned from successful crowdsourcing projects in terms of scaffolding workflows and presenting the ability to complete more complex tasks as a reward for previous successful completion of simpler ones. Jackson et al. explain how scaffolding in the crowdsourcing platform for the Gravity Spy project[33] helps volunteer participants to make progress toward more complex classification. Gravity Spy uses "gold-standard" data (records that have already been cataloged or classified by an expert) as a source for comparison to assess novice cataloger work. That comparison can be used either to promote them to a more advanced level or to provide helpful feedback so they can learn from their mistakes (checkpoint 8.3, increase mastery-oriented feedback), something we would like to eventually incorporate in DressDiscover. More generally, this checkpoint could be supported by providing functionality for mentors, supervisors, and trainers to point out parts of a record that need improvement or for version control features to help catalogers see the "before and after" of improvements made to their work by others to learn from their mistakes.

Use multiple tools for construction and composition (checkpoint 5.2)

Records created using DressDiscover can be output in multiple formats for reuse in other collection management systems. Many collection management systems are designed for broad collections and may be less user-friendly overall, so it helps to be able to use multiple tools in a modular fashion. Catalogers can go through the DressDiscover workflow but then upload their metadata into their institution's standard system since Costume Core is based on and interoperable with widely used metadata standards.

Many of the elements from Costume Core that are used as features in DressDiscover apply only to historic clothing artifacts and are not present in standard management systems for galleries, libraries, archives, and museums (GLAMs). Such systems are typically designed to describe a wider range of object types using a smaller number of fields that will be relevant to all. Typically, any other description is in a "catch-all" description field. However, DressDiscover includes functionality to support this limit

on interoperability as well. One output from a completed worksheet is delimited text, which catalogers can then build upon to rephrase as desired into a more detailed text description field or even for use as the starting point for drafting an exhibit label. When this will be used for display purposes for end users, it can be helpful to "massage" this text into a more narrative format, adding transition phrases, different punctuation, etc. to make it more readable. Such editing could be done in an institution's own database or in a word processor or a text editor for online display, as appropriate to the intended use and audience. When time is taken to examine the output of the record and imagine its use in other settings, catalogers have the opportunity to reflect on their cataloging decisions (checkpoint 9.3, develop self-assessment and reflection). They can assess their own work, decide if they need to loop back to make any improvements, and take pride in what they have accomplished. With all the stressors we face in both the workplace and our daily lives, it's important to build in such opportunities for celebration of work well done.

Conclusion: "Universal" includes Library Workers

Considerations for UDL in academic libraries may be more concerned with students as patrons. However, we must remember that library workers are also users of library systems, are also learners, have a range of prior experiences and skill levels, and may have disabilities, both visible and invisible. Whether as degreed librarians, student volunteers, or anything in-between, library workers have constant needs to learn new tools and processes or engage with new content in our collections. However, the learning curve of most current library cataloging systems excludes many from the process at a time when libraries are trying to be more inclusive.

The UDL principles discussed here should be considered by anyone designing cataloging systems and applied to the cataloging process for a much wider range of materials. While DressDiscover is focused on a visual cataloging workflow for historic clothing, we believe libraries could easily adapt the application to help library workers catalog other visual materials as well, including a range of 3D objects and 2D images. In addition, any media type can benefit from alternative representation of concepts: text supplemented with visuals or audio or audio with captions or visuals, all with different language options, synonyms, and definitions. Options for sequencing in separate steps help with focusing on one step at a time. Structural relationships can be highlighted in visual layout groupings, even for text, or in pauses or other signals between audio segments. This is very different from trying to tack on limited accessibility features to a tool that already exists.

Many of the aspects we've discussed with regard to DressDiscover overlap closely with suggested accommodations listed on the website AskJAN.org (Job Accommodation Network)[34] for cognitive limitations, including attentiveness and concentration, executive functioning deficits, and organizing, planning, and prioritizing. While many of us can think of times that we have had difficulty with one or more of these, only some of us would identify as having the specific disabilities these are listed under, such as mental health conditions, attention deficit-hyperactivity disorder (AD/HD), autism spectrum, and even

aging. As noted by Barlow, "At some point in our lives, each of us is disabled. It may be for a few weeks while an injury heals, or longer for a more severe hurt or illness."[35] But given the stigma associated with disclosure of disability discussed by Oud, and her study participants' concern for anonymity and confidentiality,[36] as well as Schomberg[37] and Hollich's[38] discussion of library workers "passing" as abled, it is very likely that more library workers have disability-related limitations in the workplace but don't formally disclose them. This is true of our students as well, with only 24 percent of students who have a specific learning disability disclosing that to their colleges.[39] However, UDL helps us to see the potential for systems that work better for everyone, regardless of labels and formal disclosure.

When UDL principles are applied to cataloging proactively, the process is improved for all catalogers and becomes more inclusive. When the cataloging process is more inclusive, more people from a wider range of experiences and perspectives can participate. When more people can participate in the process, more of our collections can gain better representation through fuller documentation of more perspectives. When more perspectives are represented, the quality of catalog records can improve and become more accessible to a wider range of researchers.

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