DSpace: The Final Frontier

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Kathryn Lightcap, Graphics and Multimedia Designer
Stacy Nowicki, Library Director

Michigan Archival Association Meeting
Marshall, MI, 25 June 2009
What’s an Institutional Repository?

Online space for:
- collecting, preserving, and disseminating
- intellectual output of an institution
- in digital form
Why Do We Need One?

- Digital access and storage of student theses (SIPs)
- Make archival materials more widely available
- Access to faculty work
But We Can’t Afford It...

Go consortial!
“National Institute for Technology and Liberal Education”

Established September 2001

Support from Mellon Foundation

Collaborations among faculty, IT, and librarians
Longsight Group

- Educational and nonprofit technology consultants
- Submitted Request for Proposal to NITLE
- Do all hosting, support, hardware/software upgrades, branding
- Suggested DSpace software
Pilot Project Beginnings

- **July 2006:** NITLE pilot project open
  - Hosting/support by Longsight Group
- **K signed up in November 2006**
- **Implemented in January 2007**
Why DSpace?

- **Open Source**
  - Cost Effective
  - Centralization of hosting/technical support
  - “Out of the Box” solution

- **Sustainable**
  - Commitments by major entities (MIT, HP, Mellon)
  - Currently in production

- **Bonuses:**
  - Crawled by Google and OAIster!
  - Persistent URLs
  - Used by other reputable institutions
Why DSpace?

- **Flexible enough for consortial use**
  - Each college has its own branding
  - Multiple workflows, formats, metadata types
  - Consortium-wide searching
  - Authentication/permissions

- **Control**
  - Ability to determine who has access to files
  - Collections can have varying permissions
Pros and Cons

• **Pro**
  - Don’t worry about hardware/software, upgrades, etc.
  - Relatively easy to use (though jargony)
  - Low cost
  - User community helps answer questions
  - Can tweak it the way you want it

• **Con**
  - Little to no training or directions – WE became experts!
  - User community may not have answer/too busy/too techie
  - Glitches!
  - Some tweaks require IT expertise we don’t have
  - Consortium model can be wacky
**Communities (Parents)**
- Contains collections and other communities
  - Ex: Kalamazoo College Publications Community
- Correspond to departments/offices/projects

**Collections (Children)**
- Types of data
  - Ex: Alumni Magazine Collection
Kalamazoo College Publications (RG52) — Community Home

This collection includes books, yearbooks, newspapers, articles, and other publications of Kalamazoo College.

Collections in this community

- Kalamazoo College Alumni Directories [3]
  - Digitized versions of published college alumni directories.
- Kalamazoo College Alumni Magazine [69]
  - Kalamazoo College alumni magazines published under various titles
- Kalamazoo College Catalogs [21]
  - This collection includes the official academic catalogs of Kalamazoo College

Sub-communities within this community

- Kalamazoo College Alternative Student Newspapers [14]
  
- Kalamazoo College Index (Student Newspaper) [42]
  Kalamazoo College student newspaper
<table>
<thead>
<tr>
<th>Issue Date</th>
<th>Title</th>
<th>Communities</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Apr-2009</td>
<td>LuxEsto (2009, Spring)</td>
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<td>Kalamazoo College</td>
</tr>
</tbody>
</table>
This Community includes digitized versions of the Kalamazoo College student newspaper, the Index.

Collections in this community

- **Kalamazoo College Index, 1885-1886** [1]
  - 1885-1886 issues of the student newspaper of Kalamazoo College

- **Kalamazoo College Index, 1934-1935** [1]
  - 1934-1935 issues of the student newspaper of Kalamazoo College

- **Kalamazoo College Index, 1962-1963** [1]
  - 1962-1963 issues of the student newspaper of Kalamazoo College

- **Kalamazoo College Index, 1968-1969** [23]
  - 1968-1969 issues of the student newspaper of Kalamazoo College
## DSpace Structure

<table>
<thead>
<tr>
<th>Issue Date</th>
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<th>Communities</th>
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</tr>
</tbody>
</table>
K College Process

1. Establish administrator
2. Define what the IR is, what it’s for
3. Write documents
4. Start practicing!
Documents

- **Policy**
  - What/who/how/why

- **Non-Exclusive Distribution License**
  - Authors retain copyright, but K College can upload and distribute

- **Metadata Chart**
  - Defines metadata elements
  - Required or optional
  - Communities, collections, items

- **Procedures: uploading, cataloging, managing**
Our Collections Today

- Focus on access; preservation not likely for everything
  - 50 GB of space – can buy more
  - Have used 10% to date (5GB)

- Most uploading done by IS staff and students
  - No staff dedicated to project
  - Ideally – distribute the work

- **Still learning** how stuff works
Materials Digitized

- Alumni magazines
- Yearbooks
- 175th Anniversary Collection
- USTA Boys 18/16 National Tennis Championship Drawsheets
- College Building Blueprints
- Plans, Reports, Institutional Research
- Student Thesis
- Thesis Posters
- Biographical Materials
- College Logos
- Commencement Speeches
- Photographs
- Artwork
Digitizing Student Theses

Pilot Project Selection Reasoning

• Access to large number of SIPs
• Familiarity of college community with material
• Standardization of metadata to be included in record
• Chemistry SIPs are the most requested, so making them available online important
Hardware

- **HP Scanjet N8460**
  - VS Kofax scanner settings
  - 300 dpi
  - Black and white
  - Automatic document feeder
Student workers

- Scan directly into Adobe Acrobat 8 Professional
- Save as PDF not PDF/A
- Deskew and optical character recognition (OCR) runs automatically
- Pages renumbered to correspond to printed theses
- Security: Password encryption is added to file to prevent unauthorized printing
- Upload SIPs to DSpace
PDF/A Compatibility

- **Not allowed in document**
  - Audio and video content
  - **Encryption**
    - Javascript and *.exe file launches
- Any fonts used must be legally embeddable for unlimited, universal rendering
- Colorspaces must be specified
- Standards-based metadata is mandated
Workflow

Student worker scans material, OCRs, and adds security to file.

Student submits PDF file to DSpace and enters basic metadata information such as name and SIP title.

Supervisor of student workers checks data record and adds additional metadata.

Metadata professional adds Library of Congress Subject Headings (LCSH) information and reviews previously entered metadata.
<table>
<thead>
<tr>
<th>Schema</th>
<th>Element</th>
<th>Qualifier</th>
<th>Value</th>
</tr>
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<td>mimetype</td>
<td>application/pdf</td>
</tr>
<tr>
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<td>relation</td>
<td>ispartofseries</td>
<td>Senior Individualized Projects. Chemistry.</td>
</tr>
<tr>
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<td></td>
<td>U.S. copyright laws protect this material. Commercial use or distribution of this material is not permitted without prior written permission of the copyright holder.</td>
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</tr>
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<td>ispartof</td>
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<tr>
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<tr>
<td>dc</td>
<td>rights</td>
<td></td>
<td>U.S. copyright laws protect this material. Commercial use or distribution of this material is not permitted without prior written permission of the copyright holder. All rights reserved.</td>
</tr>
<tr>
<td>dc</td>
<td>type</td>
<td></td>
<td>Thesis</td>
</tr>
</tbody>
</table>
COLLECTION AUTHORIZATION

- Setting up Collection Authorization was challenging.
  - Students workers have permission to upload to DSpace, but they do not have rights to modify their submissions.

- Password protecting the SIP files was necessary because of copyright issues.
  - Do we give student workers password?
Problems / Issues

PAPER

- Old SIPs typed on different types of paper, such as rice paper or heavyweight/card stock
  - Not always compatible with scanners
  - OCR scanner jammed

- Older SIPs used adhesive to attach pictures, graphs, and charts to pages.
  - Many graphics barely attached and could not be scanned using ADF
  - Scanned pages separately, using the flatbed, and inserted into the PDF
OPTICAL CHARACTER RECOGNITION

- OCR is not an exact science.
- Characters are often misread.
- If the OCR is wrong in the PDF, the extractable text will be garbled.
Problems / Issues

HARDWARE

- A fast OCR scanner needed to be coupled with a powerful computer in order for the searchable PDF to be created in an acceptable amount of time. Otherwise, time was wasted.
Current and Future Challenges

Retrieving graduating students born-digital SIPs.

- No single authority responsible for overseeing SIP production.
- SIPs are printed and submitted to the appropriate department who house them.
- Scanning papers that have been born-digital wastes time and resources.
- Collecting unique SIPs, such as art, video, music, theatre,...
DSpace Community Concerns

- **Scalability**
  - Ability to handle large quantities of data
  - Concurrency
    - DSpace’s performance when heavy simultaneous repository access
  - Ingest rate
    - How fast DSpace can ingest/export content from/to elsewhere

DSpace Community Concerns

- **Interoperability**
  - **Data interoperability**
    - allowing data to be shared between DSpace and other systems, and migrated between them when appropriate.
  - **Service interoperability**
    - DSpace services can be requested and performed on behalf of external systems, whether other repositories or applications build on top of DSpace.
  - **Ability to modify the functionality of DSpace itself**

Google Web Analytics
Dashboard or “Main Page”
Visitors Overview

1,734 people visited this site

- 1,971 Visits
- 1,734 Absolute Unique Visitors
- 7,549 Pageviews
- 3.83 Average Pageviews
- 00:02:17 Time on Site
- 59.31% Bounce Rate
- 84.68% New Visits

Visitor Segmentation

- Visitors Profile: languages, network locations, user defined
- Browser Profile: browsers, operating systems, browser and operating systems, screen colors, screen resolutions, java support, Flash
- Map Overlay: Geolocation visualization

Try Website Optimizer
Increase conversions by testing different content

Technical Profile

<table>
<thead>
<tr>
<th>Browser</th>
<th>Visits</th>
<th>% visits</th>
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</thead>
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<tr>
<td>Firefox</td>
<td>680</td>
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<tr>
<td>Safari</td>
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<td>4.87%</td>
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<tr>
<td>Chrome</td>
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<td>1.57%</td>
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<tr>
<td>Opera</td>
<td>21</td>
<td>1.07%</td>
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<table>
<thead>
<tr>
<th>Connection Speed</th>
<th>Visits</th>
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<tr>
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<td>589</td>
<td>29.86%</td>
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<tr>
<td>DSL</td>
<td>454</td>
<td>23.03%</td>
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<tr>
<td>T1</td>
<td>452</td>
<td>22.93%</td>
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<tr>
<td>Cable</td>
<td>405</td>
<td>20.55%</td>
</tr>
<tr>
<td>Dialup</td>
<td>59</td>
<td>2.99%</td>
</tr>
</tbody>
</table>

view full report
Map Overlay – by Country

1,971 visits came from 94 countries/territories

<table>
<thead>
<tr>
<th>Site Usage</th>
<th>Goal Conversion</th>
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</thead>
<tbody>
<tr>
<td>Visits</td>
<td>Pages/Visit</td>
</tr>
<tr>
<td>1,971</td>
<td>3.83</td>
</tr>
</tbody>
</table>

| Avg. Time on Site | % New Visits | Bounce Rate |
|-------------------|--------------|
| 00:02:17          | 84.73%       | 59.31%      |

<table>
<thead>
<tr>
<th>Detail Level</th>
<th>Country/Territory</th>
<th>Visits</th>
<th>Pages/Visit</th>
<th>Avg. Time on Site</th>
<th>% New Visits</th>
<th>Bounce Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>United States</td>
<td>1,019</td>
<td>5.78</td>
<td>00:03:30</td>
<td>78.02%</td>
<td>51.72%</td>
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<tr>
<td>2.</td>
<td>Mexico</td>
<td>130</td>
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<td>00:00:33</td>
<td>93.85%</td>
<td>76.15%</td>
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<tr>
<td>3.</td>
<td>United Kingdom</td>
<td>78</td>
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<td>70.51%</td>
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<tr>
<td>4.</td>
<td>Australia</td>
<td>58</td>
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<td>00:01:52</td>
<td>98.55%</td>
<td>67.24%</td>
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</table>
Map Overlay – by City

1,971 visits came from 906 cities

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<th>Pages/Visit</th>
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<td></td>
<td>Kalamazoo</td>
<td>180</td>
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<td>00:12:51</td>
<td>44.44%</td>
<td>20.00%</td>
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<td></td>
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<td>58.79%</td>
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<td></td>
<td>London</td>
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<td>1.97</td>
<td>00:02:34</td>
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<td>96.21%</td>
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<tr>
<td></td>
<td>Oaxaca</td>
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<td>56.43%</td>
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<tr>
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<td>(not set)</td>
<td>24</td>
<td>1.00</td>
<td>00:01:15</td>
<td>90.32%</td>
<td>58.33%</td>
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<tr>
<td></td>
<td>Madrid</td>
<td>24</td>
<td>1.46</td>
<td>00:01:22</td>
<td>95.83%</td>
<td>66.67%</td>
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<tr>
<td></td>
<td>Nashville</td>
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<td>80.00%</td>
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<td></td>
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<td>2.06</td>
<td>00:01:54</td>
<td>94.44%</td>
<td>61.11%</td>
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<tr>
<td></td>
<td>Grand Rapids</td>
<td>16</td>
<td>2.19</td>
<td>00:00:39</td>
<td>87.50%</td>
<td>59.00%</td>
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</tbody>
</table>
### Traffic Sources Overview

All traffic sources sent a total of 1,971 visits

- **8.27%** Direct Traffic
- **9.59%** Referring Sites
- **82.14%** Search Engines

#### Top Traffic Sources

<table>
<thead>
<tr>
<th>Sources</th>
<th>Visits</th>
<th>% visits</th>
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<tbody>
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<td>google (organic)</td>
<td>1,541</td>
<td>76.18%</td>
</tr>
<tr>
<td>(Direct) (direct)</td>
<td>163</td>
<td>8.27%</td>
</tr>
<tr>
<td>Images.google.com (referral)</td>
<td>30</td>
<td>1.52%</td>
</tr>
<tr>
<td>bing.com (referral)</td>
<td>20</td>
<td>1.01%</td>
</tr>
<tr>
<td>aol (organic)</td>
<td>16</td>
<td>0.81%</td>
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<table>
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<tr>
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<td>32</td>
<td>1.98%</td>
</tr>
<tr>
<td>keresky kalamazoo</td>
<td>20</td>
<td>1.24%</td>
</tr>
<tr>
<td>&quot;m. o. prosper&quot;</td>
<td>13</td>
<td>0.80%</td>
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<tr>
<td>chemistry projects for college</td>
<td>13</td>
<td>0.88%</td>
</tr>
<tr>
<td>kalamazoo college alma mater</td>
<td>9</td>
<td>0.56%</td>
</tr>
</tbody>
</table>

[View full report](#)
# Keywords

**Overview**

**Keywords**

[Graph showing visits over a period]

**Search sent 1,619 total visits via 1,391 keywords**

<table>
<thead>
<tr>
<th>Search Term</th>
<th>Visits</th>
<th>Pages/Visit</th>
<th>Avg. Time on Site</th>
<th>% New Visits</th>
<th>Bounce Rate</th>
</tr>
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<td>1. kalamazoo college yearbooks</td>
<td>32</td>
<td>2.53</td>
<td>00:00:47</td>
<td>6.25%</td>
<td>71.88%</td>
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<td>2. intensity kalamazoo</td>
<td>20</td>
<td>16.16</td>
<td>00:11:22</td>
<td>0.00%</td>
<td>5.00%</td>
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<tr>
<td>3. &quot;w. v. prager&quot;</td>
<td>13</td>
<td>55.60</td>
<td>00:42:42</td>
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<td>7.86%</td>
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<td>92.31%</td>
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<td>9</td>
<td>3.22</td>
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<td>6</td>
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<td>9. historia de la pelota mactaca</td>
<td>6</td>
<td>1.00</td>
<td>00:00:00</td>
<td>100.00%</td>
<td>100.00%</td>
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<tr>
<td>10. pelota mactaca</td>
<td>6</td>
<td>1.00</td>
<td>00:00:00</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

**Filter Keyword** containing Go
Content Overview

Pages on this site were viewed a total of 7,549 times

- 7,549 Pageviews
- 4,872 Unique Views
- 59.31% Bounce Rate

Top Content

<table>
<thead>
<tr>
<th>Pages</th>
<th>Pageviews</th>
<th>% Pageviews</th>
</tr>
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<tbody>
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Navigation Analysis
- Navigation Summary
- Entrance Paths
- Entrance Keywords

Landing Page Optimization
- Entrance Sources
- Entrance Keywords

Click Patterns
- Site Overlay
- Try Website Optimizer

view full report
Content Overview

Pages on this site were viewed a total of 7,549 times

- 7,549 Pageviews
- 4,872 Unique Views
- 58.31% Bounce Rate
Content by Title

958 page titles were viewed a total of 7,549 times

<table>
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Análisis de el Llano en Llamas por Juan Rulfo

Authors: Redshaw, Rosemary

Issue Date: 7-Jan-1963

Publisher: Kalamazoo College.


Description: 101 leaves

URI: http://hdl.handle.net/10090/4056

Appears in Collections: Kalamazoo College Spanish Language and Literature Senior Individualized Projects

Files in This Item:

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Show full item record

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.
About the “K” Archives

- Staffed part-time + students only
- Collection includes at least 25,000 images
- In early stages of digital initiatives
Archives Materials for DSpace

- Photographs
- Historical documents
- New materials that would be archived in traditional format anyway
Choosing Materials

- Recurring demands
- “Index” information
- Existing descriptive info
- Ease of digitizing materials
- Uniqueness
- Interesting discoveries
Why DSpace?

- Cost, technical aspects of other systems
- All in one approach
- Features: RSS, automatic thumbnail and text extraction, OAISTER
- Reduce access to originals
Adding an item to DSpace

1. Preliminary prep of digital file (bitstream)
   - Digitizing process?
   - File naming convention?
   - Watermarking or other identification within file?
   - Backup plans?

2. Choose community/collection
Example: Archives Photo

Archives file no. C16.03.12

Hoben Hall, 1938

Photographer: Richard Averill Smith

Have TIFF and JPEG
My submissions: Heidi Butler

Authorization Groups I'm a Member Of

- COLLECTION_436_ADMIN
- COLLECTION_401_DEFAULT_ITEM_READ
- COLLECTION_327_DEFAULT_ITEM_READ
- COLLECTION_351_DEFAULT_ITEM_READ
- COLLECTION_662_DEFAULT_ITEM_READ
- COLLECTION_365_DEFAULT_ITEM_READ
- COLLECTION_373_DEFAULT_ITEM_READ
- COLLECTION_343_DEFAULT_ITEM_READ
- COLLECTION_367_DEFAULT_ITEM_READ
- COLLECTION_362_DEFAULT_ITEM_READ
- COLLECTION_320_DEFAULT_ITEM_READ
- COLLECTION_333_DEFAULT_ITEM_READ
- COLLECTION_369_DEFAULT_ITEM_READ
- COLLECTION_355_DEFAULT_ITEM_READ
- Washington College
- COLLECTION_322_DEFAULT_ITEM_READ
- COLLECTION_402_DEFAULT_ITEM_READ
- COLLECTION_356_DEFAULT_ITEM_READ
- COLLECTION_442_SUBMIT
- COLLECTION_390_DEFAULT_ITEM_READ
- COLLECTION_336_DEFAULT_ITEM_READ
- COLLECTION_364_DEFAULT_ITEM_READ
- Administrator
- COLLECTION_367_DEFAULT_ITEM_READ
- COLLECTION_345_DEFAULT_ITEM_READ
- COLLECTION_399_DEFAULT_ITEM_READ
- Kalamazoo College
- COLLECTION_363_DEFAULT_ITEM_READ
- COLLECTION_368_DEFAULT_ITEM_READ
- COLLECTION_358_DEFAULT_ITEM_READ
- COLLECTION_319_DEFAULT_ITEM_READ
- COLLECTION_365_DEFAULT_ITEM_READ
Submit: Choose Collection

Select the collection you wish to submit an item to from the list below, then click "Next". More Help...

Collection

- 116 Catherine Street Blueprints
- 217 Monroe Street (The Forum) Blueprints
- Anderson Athletic Center Blueprints
- Barclay Letters (MSS 002)
- Baruch Test Collection
- Brooklyn College Student Activities
- Campus Flat Blueprints
- CGO Insights
- Chinese Collection
- Collection with Additional QOC Elements
- College of Staten Island Test Collection
- Course Catalog
- Course Catalog
- Course Catalog
- Crissey Hall Blueprints
- CUNY Central Test Collection
- DeWaters Hall Blueprints
- Dewing Hall Blueprints
- Disaster and Recovery Plan Documents
- Dow Science Center
Adding an item (cont.)

- What type of item will it be in DSpace?

- These choices lead to different types of descriptive forms
- We check the second option for almost everything
Submit: Describe this Item

Please fill in the requested information about this submission below. In most browsers, you can use the tab key to move the cursor to the next input box or button, to save you having to use the mouse each time. [More Help...]

Enter the names of the authors of this item below.
Last name  First name(s) + "Jr"
E.g. Smith  Donald Jr
Authors

Enter the main title of the item.
Title

Please give the date of previous publication or public distribution below. You can leave out the day and/or month if they aren’t applicable.
Date of Issue

Enter the name of the publisher of the previously issued instance of this item.
Publisher

Enter the standard citation for the previously issued instance of this item.
Citation

Enter the series and number assigned to this item by your community.
Series/Report No.

If the item has any identification numbers or codes associated with it, please enter the types and the actual numbers or codes below.
Identifiers

Select the type(s) of content of the item. To select more than one value in the list, you may have to hold down the "CTRL" or "Shift" key.
Type

Select the language of the main content of the item. If the language does not appear in the list below, please select "Other". If the content does not really have a language (for example, if it is a dataset or an image), please select "NA".
Submit: Describe this Item

Please fill further information about this submission below. (More Help...)

Enter appropriate subject keywords or phrases below.

Subject Keywords

Hoben Hall  Dormitory
Remove    Remove
Kalamazoo Colleg

Enter the abstract of the item below.

Abstract

Hoben Hall dormitory.

Enter the names of any sponsors and/or funding code in the box below.

Sponsors

Enter any other description or comments in this box.

Description

One of the many buildings on campus designed by Ayerse Ebarr, Hoben Hall was dedicated in January, 1937, and named after the college’s recently deceased president, William Hall, which Hoben Hall replaced as the men's...
We will restrict TIFF files to campus use only but JPEGs will be public.
Steps After Uploading

- “Verify” screen to check all previous info and uploaded files
- Option to choose Creative Commons license
- Final option: our Kalamazoo College license agreement
- Submission complete! Now go fix it.
One of the many buildings on campus designed by Aymar Embury, Hoben Hall was dedicated in January, 1937, and named after the College's recently deceased president Allan Hoben. Williams Hall, which Hoben Hall replaced as the men's dormitory, was torn down as soon as the male students had moved out of it and into Hoben.
Edit Item

PLEASE NOTE: These changes are not validated in any way. You are responsible for entering the data in the correct format. If you are not sure what the format is, please do NOT make changes.

Item internal ID: 6430
Handle: 10090/6193
Last modified: 19-Oct-2008 17:29:27
In Collections: Kalamazoo Collagea Sandbox
Item page: http://dspace.nitle.org/handle/10090/6193
Item's Authorizations: [Edit]

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Batch Uploading

- Can be done--by NITLE staff
- Complete a spreadsheet with DC fields, collection destination
- Send in images
Anniversary Project

- Anniversary funds + lack of staff time = let’s outsource!
- WMU Digitization Center is next door
  - Project planning
  - Scanning for 200 images
  - Training session
- Great learning opportunity
Our Collections

URL to Watch:
http://reason.kzoo.edu/dspace/

Community:
Kalamazoo College Archives

Collection:
Kalamazoo College 175th Anniversary Photograph Collection
Footnote: NC ECHO

http://www.ncecho.org/dig/digguidelines.shtml

“Scan Once Methodology”: Section 4.2