

Educating for an Entrepreneurial Spirit in Emerging STEM Information Professionals

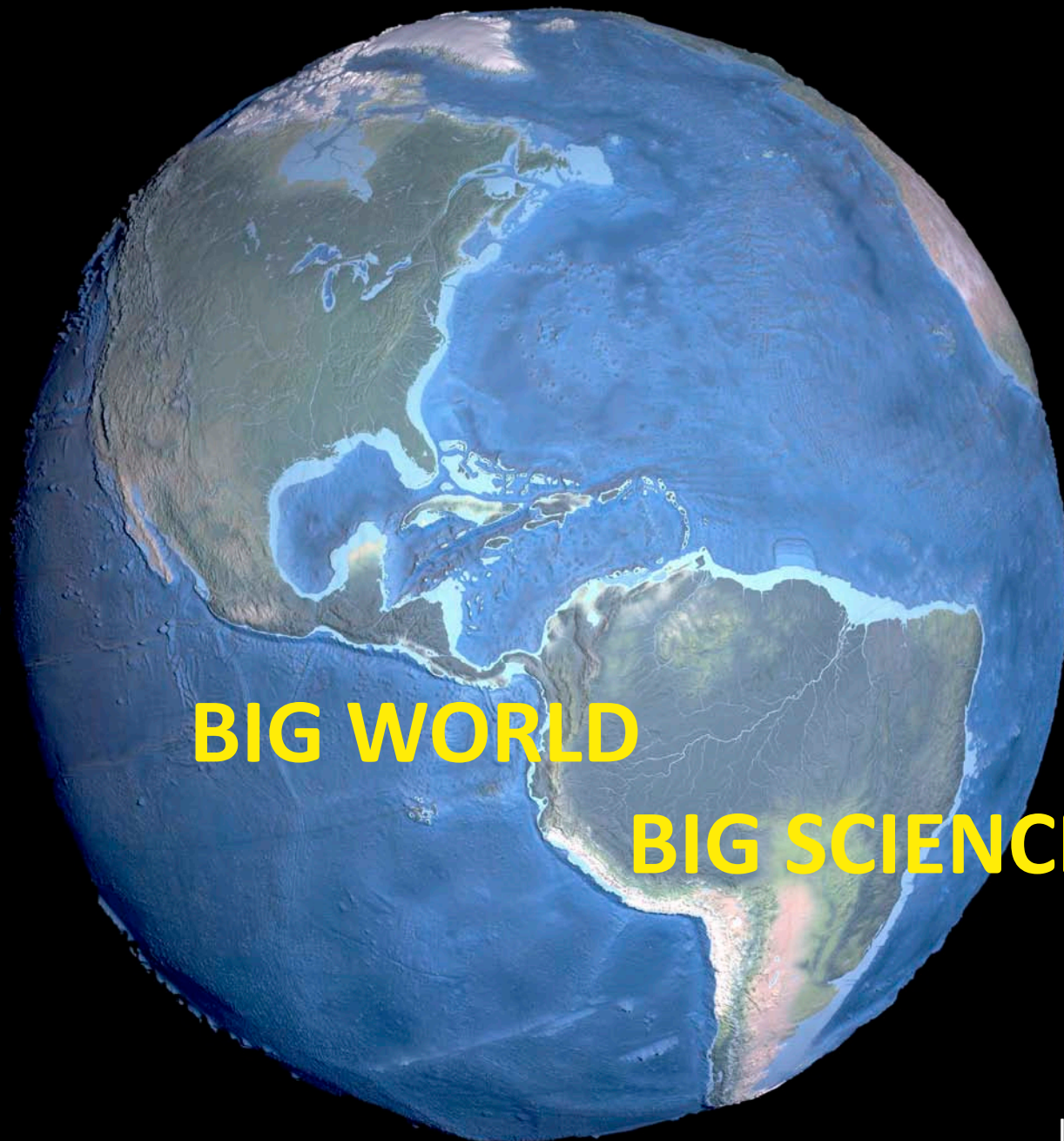
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BIG WORLD

BIG SCIENCE

BIG DATA



The
**FOURTH
PARADIGM**

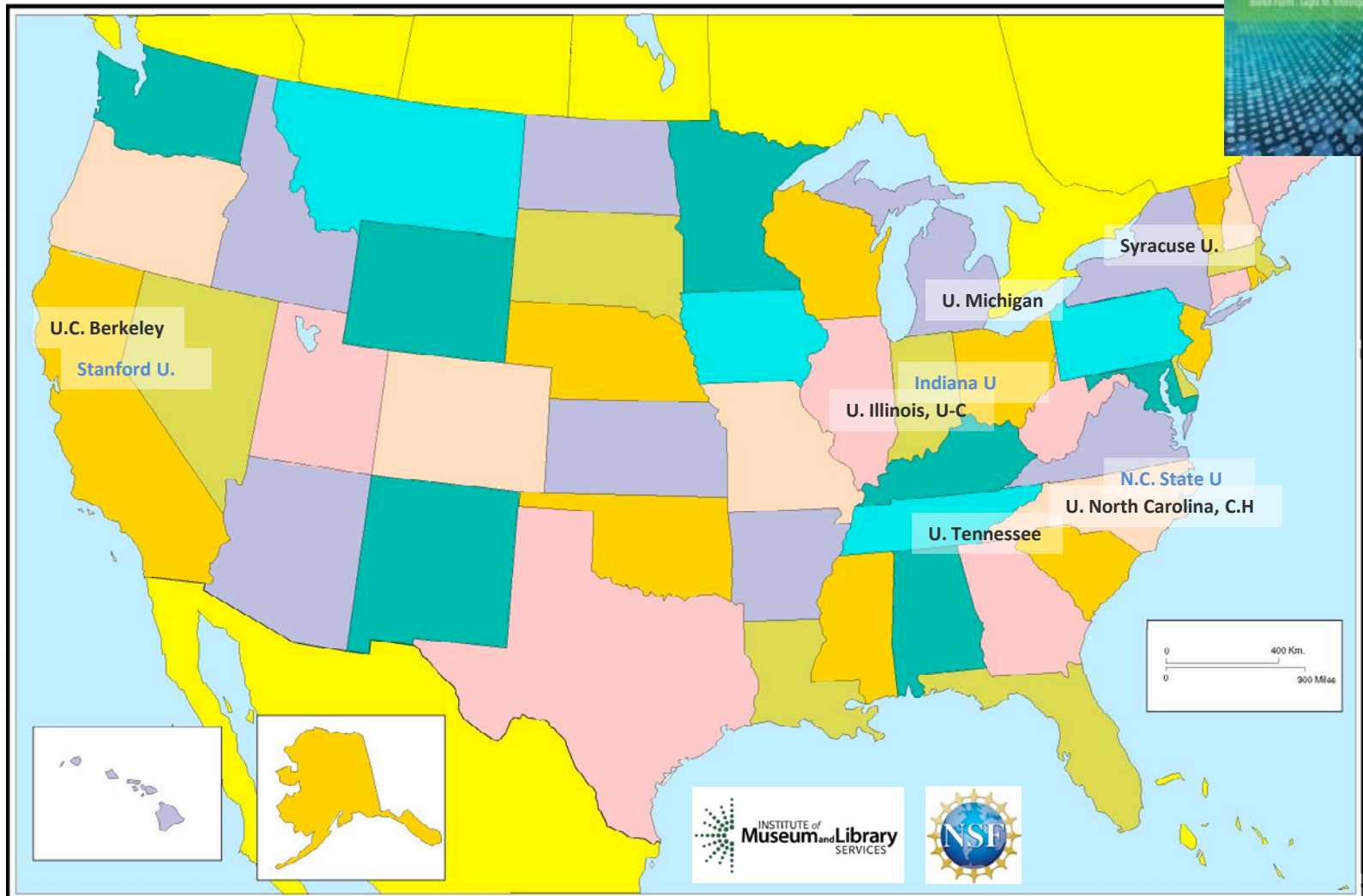
DATA-INTENSIVE SCIENTIFIC DISCOVERY

EDITED BY TONY HEY, STEWART TANSLEY, AND KRISTIN TOLLE

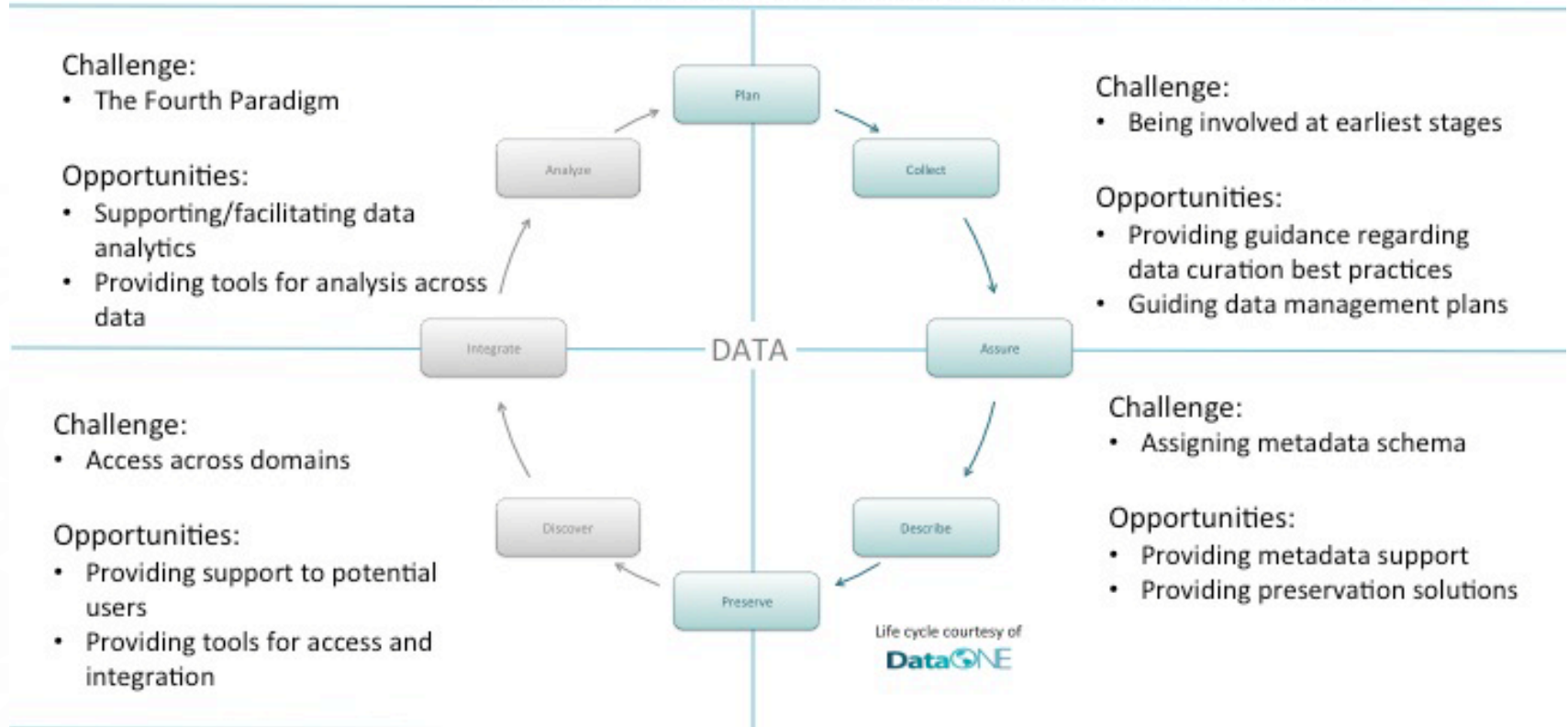
- **Data Science: workforce short**
estimated 140,000-190,000
people who can handle and
analyze data. Manyika et al, 2011



Educating the Workforce



Data Lifecycle & Information Professionals



Source: Allard, S. (2012). The Data Life Cycle & Information Professionals. Third Annual ASIST Research Data Access and Preservation Summit. New Orleans, LA. 21 March 2012.

Successful Professional Profile

- Expertise in information sciences e.g. metadata
- Familiarity with domain specific vocabulary, concepts, & culture
- Understanding of technology
- Comfort with statistical concepts
- Ability to work in multi-disciplinary teams



Image: By William Ely Hill (1887–1962) („Puck“, 6. Nov 1915) [Public domain], via Wikimedia Commons

Entrepreneurial Spirit



Willing to take constructive risks in order to help a project succeed.

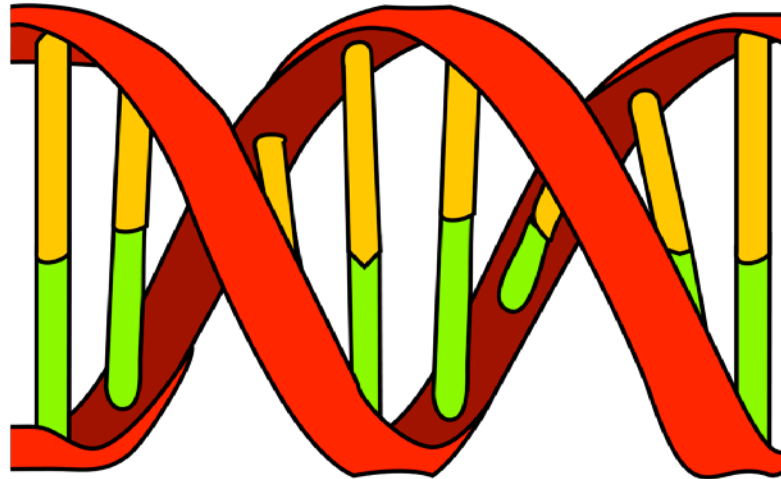
Image: BASE Jump from Earth, Xof711, July 2004, via Wikimedia Commons

Entrepreneurial Spirit and the Successful Professional Profile

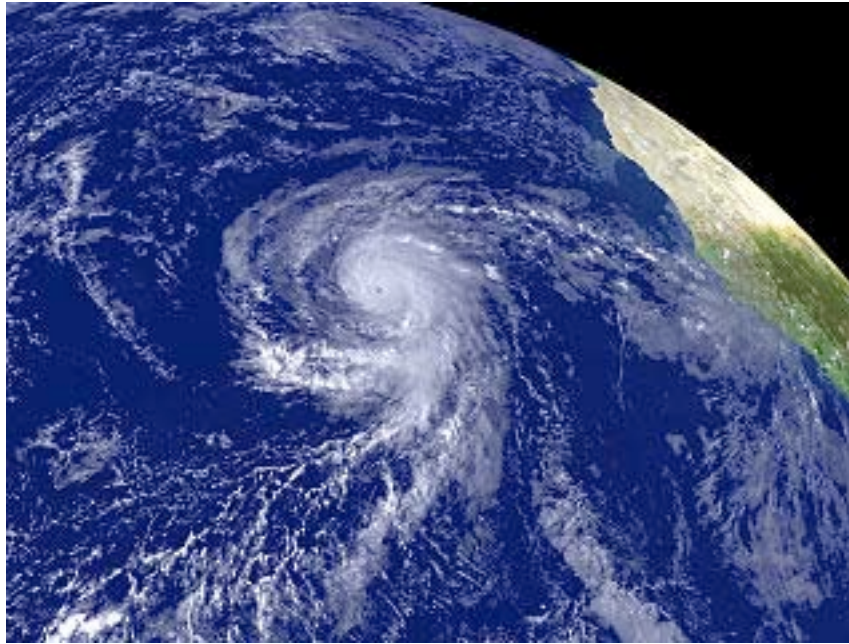
- Expertise in information sciences e.g. metadata
- **Familiarity with domain specific vocabulary, concepts, & culture**
- Understanding of technology
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- **Ability to work in multi-disciplinary teams**

Science & Culture

“the behaviors and beliefs characteristic of a particular social, ethnic, or age group”



Cultural Proximity



- Regardless of geographical location people will be attracted to media from their own culture.

Code-Switching

- Speakers switch between two or more languages to emphasize or minimize differences



Cultural Dimensions

Cultures have profiles that can be better understood by assessing six dimensions.

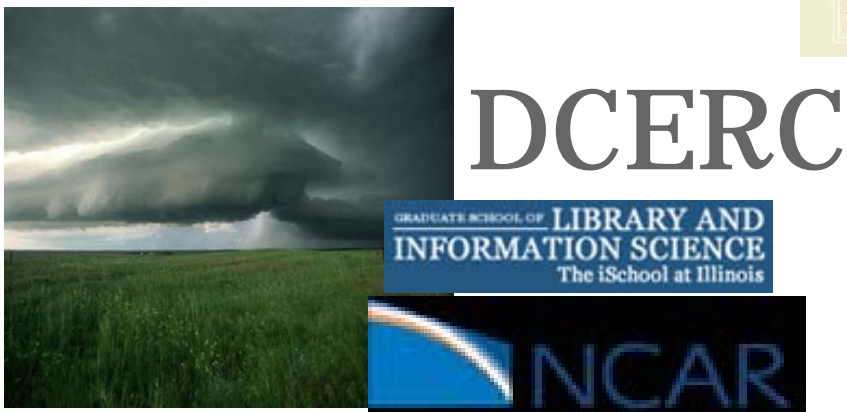
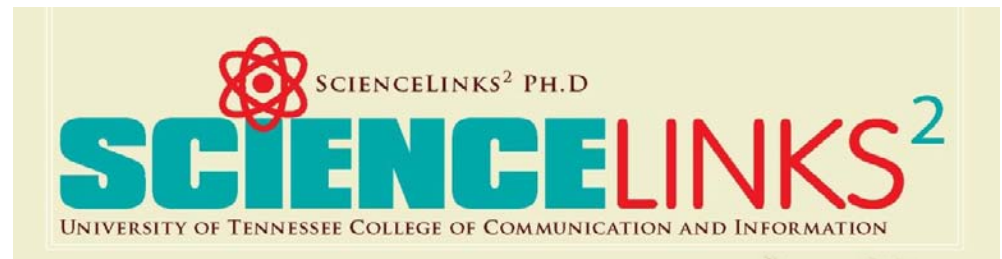
Image: (Work by Uwe Kils)
<http://www.ecoscope.com/iceberg/>

Science Information Research



- Sociocultural research
- Usability research
- Assessment research
- Cyberinfrastructure development
- “Big Data”
- Post doctoral mentoring
- Student development

UT Science Information Education Initiatives



Latino Scholars Cambio
Leadership Academy



The Way Forward...

- Coursework to develop toolset
 - Balance between multi-disciplinary understanding / subject expertise
- Mentoring
 - Socialization into sciences
 - Entrepreneurial courage
- Practica/Internships
 - Feedback Loop
 - Partnerships
- Life of the School



Thank You!

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Virtual Internships

*Assessing the Contribution of Novel Field
Experiences to MLIS Graduate Goals*

Sheila Corral, Rose Medlock & Lauri Watt



Assessing Virtual Internships: Contribution to Graduate Goals

Outline

- Background, rationale, objectives, and frameworks
- Methods, participants, and data
- Results
 - Comparing in-service and post-experience reflections (internship as field experience for credit)
 - Analyzing post-experience reflections and lessons learned (internship as co-curricular work experience)
- Conclusions



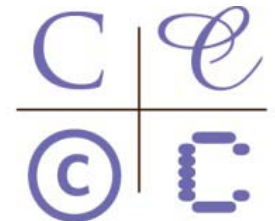
Background to the Study

- Practical experience and professional networking viewed as especially important in a tight job market
- Traditional credit-based practicum supplemented by internship, volunteering, shadowing, mentoring, etc.
 - work plans for **practica** designed to meet student needs, duties of **interns** and **volunteers** defined by employers
 - some internships may serve as field placements for credit, other work experiences may not be assessed or evaluated
- Remote online working/virtual interning recognized as flexible option and good prep for digital roles
 - spectrum ranges from established service providers (e.g., Internet Public Library) to emerging areas (e.g., e-science)



Credo Reference Internships

- Internship program started early to mid 2010
- Approximately 40 completed internships
 - 26 virtual, predominantly MLIS students, 6 institutions
 - 4 MLIS virtual interns have become Credo full-time hires, many virtual interns stay on part-time beyond their term
- All internships are paid, all are formally evaluated
 - students can also receive academic credit if the work meets the requirements of their MLIS programs
- Virtual working is part of the Credo culture
 - at least half of the full-time staff is spread geographically in 10 US states and in the UK



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reference



Rationale for the Pitt Project

- Evidence on the value of virtual internships in LIS relatively sparse and largely anecdotal
- Concern that paid and unpaid library work of MLIS students should add value to their programs of study
 - especially opportunities promoted by the iSchool with Pittsburgh-area employers and online service providers
- Commitment to assessing learning at program level other than as an aggregation of course outcomes
 - with particular reference to the MLIS Goals for Graduates (encouraged by questions and feedback from COA ERP)
- Interest in advancing reflective practice within LIS



Learning things every day

– not just information literacy and instructional design

“communicating work questions and personal small talk through Skype simulates the experience of working in an office... we share productivity tips that have worked for us and help keep each other accountable”

“my supervisors have consistently embodied Credo’s values, especially that ‘we have an attitude of service to each other, all stakeholders and to the society we live in’”

“the company consciously fosters a culture equally driven by excellence and humanity”

“I have been learning to bring my best self to work”

“the weekly company-wide meeting
...help keep the employees unified”

“I have taken more responsibility for my own work...”



How Does Online Interning Contribute To Attaining MLIS Program Goals?

Aims

- Evaluate experiences of MLIS students who worked as virtual interns for Credo Reference in 2013

Objectives

- Define individual learning outcomes for each student
- Determine the contribution of the internship to general program goals
- Explore whether background or mode of study affected the student experience
- Test the MLIS goals as an evaluation framework



Types and Levels of Reflection

- Technical reflection
 - generate and validate empirical knowledge to ensure work procedures are sound
 - Practical reflection
 - describe, clarify, and explain an event to interpret experiences
 - Emancipatory reflection
 - liberate self from taken-for-granted assumptions and take transformative action
- (Brockbank & McGill, 2007; Taylor, 2004)
1. Narrative reflection
 - return to an event and describe what happened
 2. Percipient reflection
 - think about the perceptions and reactions involved
 3. Analytical reflection
 - think about the situation analytically
 4. Evaluative reflection
 - evaluate the experience
 5. Critical reflection
 - consider implications for the future



Goals for Graduates of the MLIS Program

Upon completion of the MLIS degree, graduates will incorporate the theories, knowledge, skills, ethical foundations and social responsibilities of the information professions into professional practice for the benefits of users.

Specifically, graduates will be able to:

- Draw upon the **ethics, values and history** of library and information science and other related disciplines.
- Apply the principles of **information management**.
- Advance the creative and ethical applications of **information technologies**.
- Apply the principles of **management** to various functions in information environments.



Goals for Graduates of the MLIS Program

(continued)

Specifically, graduates will be able to:

- Plan, implement, evaluate and advocate information **services** to meet the needs of diverse users.
- Promote intellectual freedom and equity of **access** to information.
- Understand and apply **research** in library and information science.
- Promote a commitment to the **advancement** of the information professions through advocacy, continuing education and lifelong learning.

<http://www.ischool.pitt.edu/lis/degrees/goals.php>



Subjects, Settings, and Sources

Participants

- Full-time on-campus student (Jessica)
 - Information Literacy Internship with Field Experience credit
- Full-time online student (Rose)
 - Information Literacy Internship with Field Experience credit
- Part-time online student (Lauri)
 - Multimedia Internship without credit (student choice)

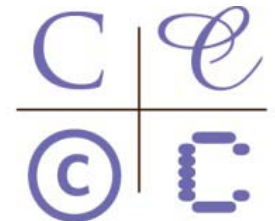
Data

- Reflective reports produced during field experience as formative and summative assignments for elective course
- Post-experience reflections on student learning outcomes of online interning in relation to MLIS graduate goals



Internship Job Summaries

- Part of the *Literati by Credo* (Academic and Public) platform integrating digital reference content, federated search, and multimedia learning tools
- Assist in the design and development of innovative and robust web-based educational materials
 - videos, tutorials, interactive modules, and more...
- Particular focus of individual positions varies, activities include:
 - information literacy pedagogy and assessment
 - graphic design and multimedia technology
 - library promotion and case studies



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Comparing In-Service and Post-Experience Reflections

Rose

Information Literacy Intern

Internship as Field Experience

Rose Flores Medlock



- Background as magazine and newspaper journalist, managing editor and freelance writer from 2003
- Graduated with MLIS from University of Pittsburgh in summer 2013
- Worked as IL Intern, then Solutions Associate (part-time) in Customer Solutions at Credo since January 2013
- Studied online and works from her home office



Use of Information Technologies

In-service reflection

- Described the range of productivity tools deployed by Credo to support day-to-day working and project management, including communications and conferences/meetings
- Explained how she substituted one standard tool for another to deal with limitations encountered in using Excel for a frequently performed task

“to improve the storyboarding step, I used the presentation option in Google Drive to draft a new storyboard master”

Post-experience reflection

- Identified potential for instructional technologies used by Credo to be applied creatively in museum education activities



Principles of Management

In-service reflection

- Described key features of the working environment at Credo, such as practices promoting collaboration and teamwork
- Identified similarities between peer review processes used in developing learning resources and editing roles in journalism

Post-experience reflection

- Explained how her pre-MLIS experience of managing people in the media industry combined with her Credo experience to facilitate integration of theory and practice

“Working at a library technology reference company while taking a management course at school helped to illustrate concepts in real-world experience”



Services to Meet Needs of Diverse Users

In-service reflection

- Described reviewing service work done by others (e.g., tutorials, videos, LibGuides)
- Reported designing a resource (video intro to e-audiobooks) for a particular community (public library in Scotland)

Post-experience reflection

- Recognized that the instructional design tasks undertaken each week typically involved all the processes in Goal 5, i.e., planning, implementing, evaluating, and advocating services

“With each new assignment, I cycle through those very abilities. Regarding this specific goal, the experience at work certainly enhanced my competence in this area.”



Intellectual Freedom and Equity of Access

In-service reflection

- Described examples of products developed at Credo that facilitate and promote access to information, including resources of potential benefit to groups with special needs, e.g., promotional videos informing community members about fire service advice and nurse visits

Post-experience reflection

- Prompted by the request to think about her experience analytically in relation to the Goals, recognized the more fundamental purpose and social value of Credo's work:

“My experience at work helped me to understand that for-profit information enterprises also can contribute to a greater good.”



Commitment to the Advancement of the Information Professions

In-service reflection

- Reported how Credo encouraged interns to engage in professional development by submitting to conferences
- Described how her supervisor sought her help in revising and expanding a peer-reviewed journal article for publication

Post-experience reflection

- Considers how Credo's Information Literacy Course Module not only supports librarians' information literacy teaching and highlights library resources, but also represents

*“one company's commitment to furthering the development of
the information professions”*

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Post-Experience Reflections and Lessons Learned

Lauri

Multimedia Intern

Internship as Co-Curricular Experience

Lauri Watt Miller



- Background as historical archaeologist with focus on colonial tidewater Maryland
- Graduating with MLIS from University of Pittsburgh in spring of 2014
- Volunteer at public libraries (children's programming, circulation, adult book discussion group, shelving)
- Worked as MM Intern with Credo from June 2013
- Worked and studied online



Ethics, Value, and History of LIS

In the MLIS program

- Tech in the Lives of Children and Youth raised issue of bullying
 - What are the responsibilities of librarians/info pros here?
 - How might this play out in a real life environment?

In the internship program

- Writing proposal for tutorial on digital citizenship for *Literati Public*, asked a fellow intern to review and help brainstorm...
- Synthesized the values of librarianship to advocate for individuals to be *upstanders*, not just bystanders, when they witness bullying firsthand

“The key is to make the values a part of everyday norms, and not just applying them on an as needed basis.”



Principles of Information Management

“There is so much information available to people today that it is important to state why it is important and why they should trust you as an information provider”

- Credo goes the extra step to provide context with information
 - changed approach to organizing information and providing descriptions of resources
 - demonstrated need for resources to include section on “Why You Should Care About This Topic”

“Information needs to be organized logically to be accessible and understandable to the viewer”

- Learning from MLIS program was reinforced daily at Credo, but also challenged by client feedback as a wild card
 - required rethinking decisions and re-evaluating plans



Understand and Apply Research in LIS

In the internship program

- Some projects are received after planning and approval, others are received at the planning stage, with only the topic and type of resource specified
 - intern has to draw up outline of material for client review, which is the main opportunity to use research in the job
- Research on cell internet use shows young adults, non-whites, low income and low education groups are cell-mostly users (Duggan & Smith, 2013)
 - challenge to make work accessible to all ages and groups
 - many gov. and library resources are not mobile-accessible, and public access computers are becoming fewer...



Most Valuable Lessons Learned

Professional detachment

“I need to take pride in my work, but have a certain level of detachment. Unlike academic work, the finished product isn’t about me, it’s about our clients and their patrons.”

Comfort zone

“I needed to say goodbye to my comfort zone. I had applied for a different intern position...”

It is second nature now to dive into subjects that I know little about, research, synthesize the information and learn to speak authoritatively about them.”



Most Valuable Lessons Learned

(continued)

Team work

“Do not be afraid to ask for help. Teams work by relying on the strengths of each member ...each intern I have interacted with offers his or her own unique skills for the benefit of the team.

For example, I asked my fellow intern Colleen to review my Affordable Care Act tutorial because I knew she had previously worked in pension consulting and had a better handle on the insurance industry. Her expert comments and suggested revisions made my tutorials so much more helpful and informative.”



Conclusions

- Virtual internships can provide rich experiences of work and learning including all the dimensions of traditional settings, notably issues around organization behavior and values
 - online interning can give students a competitive edge in their competence, confidence, and creativity in using ICTs
- Using MLIS goals as an analytical framework enabled deeper critical reflection and raised awareness of learning outcomes
- Guided reflection enabled students to make sense of their thoughts and memories, especially to
 - relate diverse experiences and knowledge
 - synthesize theory with practice, scholarly, and personal
 - recognize values
 - identify abilities and weaknesses



Any Questions?

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[@credoreference.com](http://credoreference.com)

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