



Towards a profile of the researcher of today: what can we learn from JISC projects?

Common Themes Identified in an Analysis of JISC Virtual Research Environment and Digital Repository Projects

**Lynn Silipigni Connaway, Ph.D.
Timothy J. Dickey, Ph.D.
OCLC Research
October 6, 2009 (revised Feb. 2010)**

Project Description

The goal of the project was to determine whether there was sufficient evidence from JISC-funded virtual research environment (VRE) and selected digital repository projects to develop a portrait of the scholar in the current virtual research environment. This was achieved by interviewing the relevant project managers. While the projects have collected data about user behaviours of specific scholars within specific disciplines, the focus was not to identify specific user behaviours but to develop products and technologies to embed into the workflows of scholars within specific disciplines; therefore, there was no conscientious effort to query a large random sample of scholars within the different disciplines.

It was determined that there was not enough empirical data to develop a portrait of the virtual researcher using the evidence from these completed projects. However, after interviewing and reviewing the interview transcripts of four digital repository project managers and seven VRE project managers (three of which were community engagement projects) as well as reviewing the project reports, papers, presentations, and some of the collected data, the following common themes emerged.

Major Themes from VRE and Digital Repository Projects

There were several major themes expressed by both the VRE and digital repository project managers during the telephone interviews.

1. **Different needs across disciplines**

The scholars' attitudes toward adoption and integration of VREs and digital repositories into their workflows will likely vary by age, discipline, and number of years of their experience within the discipline. Most of the project managers believed that scholars in the science disciplines were more apt already to be using digital repositories and VRE systems, while they believed those in other disciplines were less inclined to be involved in these activities and required more encouragement and evidence that involvement will benefit them than science scholars. Summary statements such as the following were common: *"General life sciences are used to using new technologies for their work ... and are not reluctant to use new technologies. Sociologists' research process is not much different than it was 5 years*

ago. They are more reluctant to use new technologies because they do not need it.” “Some disciplines have a tradition of self-archiving and disseminating – math and computer science. Others are not doing this.”

2. **Difficult systems a challenge to adoption**

Ease of use and the need to embed the systems into the scholars' workflows are critical, yet can be difficult to accomplish. The scholars were reluctant to use new technologies not because they were not interested in these new technologies, but because it would take time to learn the new systems and processes. The scholars stated they did not have the time to input data and materials into the systems. (*“Something that came up several times is that they did not have time to learn to use the social networking and other technologies. If we could bring the technologies to their workflow/systems, they may use them.”*) Some were unaware that the systems existed and those who were aware of the systems did not know about or understand the potential of the systems to streamline some of their work processes and to facilitate sharing and disseminating data, reports, presentations, papers, etc.

3. **Privacy concerns**

The scholars expressed concerns about privacy and safety in limiting the data that was shared. One of the digital repository project managers stated, *“The concept of a safe environment as far as security on the web was an issue. If we were going to set up a social network, we would need to create a safe environment, which was very important to the researchers.”*

4. **Need for advocacy, promotion, publicity, and marketing**

Most of the project managers stressed the need for advocacy, promotion, publicity, and marketing of the systems to the scholars. One of the project managers said, *“Many interviewees had very little knowledge of the repositories;”* another echoed with, *“They had very low levels of awareness of what we are offering.”* This promotion and publicity should identify how and why the systems can provide greater access and easier dissemination of research. Since the research has a broader exposure, it can generate more citations, which can mean a greater impact for the work. The systems also have the potential to increase the efficiency of the workflow by providing a centralized management system for sharing research data, materials, results, and outputs.

Common Themes Specific to Digital Repository Projects

1. **Lack of understanding of copyright and copyright compliance**

Most of the digital repository project managers said the scholars lacked an understanding of copyright and the issues of copyright compliance. Many of the scholars did not understand or could not remember or retrieve the agreements that were signed with publishers for the publication and dissemination of their work. (*“Researchers could be more aware of what they signed and what rights they retain. They often admit that the copyright agreements are just a tick box.”*) This could be attributed to the fact that these details were not important prior to digital repositories and open access issues.

2. **Use Google and data bases for research and teaching**

The scholars who participated in the Personal Engagement with Repositories through Social Networking Applications (PERSoNA) project were asked to describe how they used the web for research and teaching. *“People talked about data bases specific to their discipline and view these as authoritative resources. They would do a Google search to find academic papers, etc. before they went to databases... Almost all said that they came across resources that they could not access. So issues came up with open access to research and copyright.”* (Quoted from one of the PERSoNA project members)

3. **Need better management of scholarly documents**

There was consensus among the digital repository managers that there is a need for better management of scholarly documents. One of the digital repository project managers stated, *“The open access goal is altruistic. The stake holders for the resource management emerged as the project went on.”*

During the course of the project, one project team learned that they needed to develop more than one ingest mode for the repository. They interviewed scholars to learn what they were already doing in terms of self-archiving, i.e., web pages, departmental sites, etc. They *“found very little activity at the departmental level and even at the individual level.”*

4. **Need for accurate metadata associated with repository documents**

Having accurate metadata associated with the documents is very important to the scholars. They often did not have the time to provide accurate metadata for their papers in the digital repositories; therefore, this creates a need for automatic metadata generation and more accurate and consistent processes for including and adding accurate metadata (*“The downside to repositories is adding metadata for teaching and learning.”*). These would provide the basis for a better system designed to make the collection of metadata more efficient and easier to use. Some of the scholars expressed a distrust of the open web and identified a need for a safe online environment. The digital repository project managers also mentioned the need for better feedback from the users of the system to the developers of the system.

5. **Difficult to embed repositories into scholars’ workflows**

The digital repository project managers stressed the difficulty of embedding the repositories into the scholars’ workflows. One stated, *“People must be convinced of the benefit of using repositories.”* Several of the project managers do not believe that mandates to deposit work in repositories will work while others wondered if mandates to comply would be the best solution.

Common Themes Specific to VRE Projects

Although most of the VRE systems and software were tested with small, discipline-specific groups, the sense of different needs across disciplines seems even stronger in the VRE and Community Engagement projects than in the digital repository projects. This may be attributed to the fact that the VRE projects deal more directly with the workflow of the scholarly effort itself, instead of its products and dissemination, and the scholars recognized the need to share with colleagues; therefore, they are more easily embedded into the scholars’ workflow. Based upon the interviews with the project managers, the VREs tend to display a more refined feedback process between the users and the developers, demonstrating a more iterative process than the digital repository projects. This may be indicative of the small, discipline-specific groups participating in the VRE projects.

1. **Scholars want to share**

Most of the scholars participating in the VRE projects wanted to be able to share data, publications, discussions, etc. with colleagues, which, too, may be indicative of the small, discipline-specific participants. When discussing the technologies used by researchers, one of the project managers stated, *“The technologies enabled the researcher to work faster, not necessarily to work better.”* Working faster is an obvious benefit and although the scholars may not necessarily work better, the technologies enable them to perform the same tasks in a different, possibly more efficient, way.

2. **Disciplines vary drastically**

There are many different groups in the research community and each has different cultures, approaches, and methods. One of the VRE project managers stated, “[C]ultural differences between the disciplines and sub-disciplines vary quite drastically.” Not all disciplines share the same language, concepts, or ideals. The culture of the disciplines dictates how and what information is shared, stored, reported, etc.

3. **Different behaviours in disciplines are driven by their cultures**

Anecdotal evidence gathered during the MyExperiment project indicates that different disciplinary behaviours are influenced by the culture of the discipline. For example, bioinformatics researchers tended to be very sharing and the culture is very open. Mathematicians wanted to share statistical models. However, they were concerned that people would use these models without understanding them; therefore, they do use the VRE site for training but not for indiscriminate sharing. This was not an issue with bioinformatics researchers. Astronomers have an agreement in place within the community that for six months the data belong to the individual or group but after six months the data are open to others. Chemists were very interested in the community hierarchy. They demanded that Ph.D. supervisors always have access to what people beneath them could access and that they had access to everything the people beneath them (Ph.D. students) were doing.

Some of the project managers believe the science and mathematics scholars involved in the VRE projects were more apt to use the software and systems than the humanities scholars who participated in the projects. There also was discussion about the initial difficulty associated with engaging some scholars in the VRE chat sessions, blogs, and social networks and communities.

4. **Security requirements vary and depend on activities**

Health Sciences researchers involved in the CREW (Collaborative Research Events on the Web) project were interested in health data. They have a need for a secure system because of the delicate nature of their health data. CREW conducted several meetings with both social scientists and scientists and provided a twitter-type system for the attendees, which enabled them to tweet during a meeting. *“It was very popular with the scientists (computer science). Social scientists were reluctant to open their laptops during sessions and left their laptops in their hotel rooms. We began providing loaner laptops to social scientists at the sessions. They were very different cultures.”*

5. **Control and availability differ with the size of the community**

The Study of Documents and Manuscripts VRE project managers learned the type of control classics faculty wanted when uploading documents and images within their system (*“It is a very small community and they are specialists.”*). Each researcher wanted a secure system that was only available to the individual researcher but also wanted another system that was available to a small group of people (approximately three or four) who were involved in a specific project. This would give all of the small group members access to the project images and system. When these small group systems were opened to others outside of the group, they were not used because the VRE was not viewed as a means for disseminating work, but for sharing ongoing work between members of the project group. The scholars envisioned disseminating their work on their own systems or via other means.

6. **Different languages are used**

The ENGage project managers learned that the language used by developers, researchers at the Ph.D. and associate levels, and researchers at the professor level is different. They use different language and express some things in a different way, but that still can be discussed between the different groups. This led to the decision to include *“a developer who was within the [scholarly] domain and, in some of the projects, we had a facilitator who*

worked on the projects and who understood the vocabulary for each of the different groups.”

7. **Time constraints hinder innovation and adoption**

The ENGage project managers also found that time constraints on the different types of people involved in the projects were very different. Difficulty scheduling time with researchers and developers for interviews and meetings was a common theme for most VRE projects. One project manager stated, *“It was difficult to get time from some of the people because of teaching and marking commitments. We had difficulty getting time with developers who had different blocks of time based on projects. It also was difficult to get time with the IT service providers within institutions; therefore, it was very important to get institutional buy-in. We had to raise the level of these projects and identify the benefits the IT providers (computing services) would get from the project, which was very difficult.”*

8. **Data security is confusing**

The ENGage project identified that there still is *“confusion about the varying requirements of data security between social scientist and sciences. Social science researchers need processing of private or constrained data. Science does not have these private data.”*

9. **Different demands on infrastructure on different levels**

There are different levels of need between the disciplines for the infrastructure. A project manager stated, *“Some domains could use the infrastructure more than others. There also are varying attitudes to what is desired in longer term sustainability of software that people use. Both the developers and end users of the software wish for the software to be maintained. All are working within the academic environment and all believe sustainability is important. However, they do not agree who should be responsible for the sustainability of the software or who should pay for it.”*

10. **Age influences adoption**

Age also is a factor in adopting new technologies, systems, and tools. The VRE in Archaeology project provided different electronic devices for the project participants to use for their work on archaeological digs. A project member said, *“The students had been using different devices, such as MP3 players, text messaging on mobile phones, etc. and quickly adopted the devices. The professors were older and reluctant to use these devices.”* The professors became more invested in using these devices after the project team worked with them to demonstrate the benefits of using the devices to work more efficiently.

11. **Involvement breaks down barriers**

Finally, the projects creating and evaluating VREs tended to operate with good feedback loops between developers and the users of the project. Comments such as, *“There was never ever a barrier between the developers and the users. We embedded the developers within the user groups.”* and *“The developers participated in the workshops. They showed the products to the archaeologists and the archaeologists said what worked and what did not and what they wanted.”* were relatively common from the respective project managers.

Conclusions

Although it was not possible to develop a portrait of the scholar in the current virtual research environment, common themes could be identified from the data collected from the digital repository and VRE interviews and the review of the project data. These findings can be a catalyst for improving digital repositories and VREs as well as for future research in the adoption and use of these tools and systems.

Whether discussing digital repositories or VREs, the scholars want the software and technology to be easy to use and to be embedded in their workflows. They do not have time to learn new software and systems, nor do they have time to add processes to their current workflows. Attitudes toward the adoption of the systems vary by demographics such as age, discipline, and number of years working within the discipline. However, some scholars do come to understand the benefits these systems offer them in terms of increased efficiency and better sharing and dissemination of their work.

The systems and software need to allow for varying levels of sharing, whether it is thoughts, ideas, workflows, data, reports, or formal papers. Not all disciplines or researchers want to share all with everyone. Privacy, copyright, and access issues also are important to scholars working in the virtual environment.

The project managers of the digital repository and VRE projects expressed a need for promoting the systems and for making the scholars aware of how the systems and tools can simplify their workflows and more widely disseminate their work.

One question that arises from this investigation is whether there is justification for developing and maintaining two different systems – VREs and digital repositories. From the discussions with scholars and those involved in the project management of the VRE and digital repository studies, there is a great deal of overlap between the two systems. Since it is difficult to engage scholars in using these systems and to embed them into the scholars' workflows, would it not be more practical to integrate the two systems to better meet the needs of the scholars? This may enable scholars, developers, and librarians to work together to develop a system that would provide access to data, thoughts, ideas, published and unpublished papers, notes, conference proceedings, and social networking capabilities and that could be embedded into the scholars' workflows. During the current economic times of decreasing budgets and added responsibilities, creating one service for sharing and connecting could be an incentive for more involvement from scholars, developers, and library staff.

Implications for Future Funded Research

1. An initial attempt to integrate several VREs and digital repositories should be explored. Although there has been an attempt for integration between VREs, e.g., the Study of Documents and Manuscripts, <http://www.jisc.ac.uk/whatwedo/programmes/vre2/sdm.aspx>, was specifically designed for interoperability with the VERA project, there has been little discussion of the integration of a VRE with a digital repository. This integration may involve a longer development and testing period than usually is allocated for the development of either of these systems individually. However, the initiative may produce systems that are embedded in the scholars' workflows, that involve scholars, developers, and librarians, and that actually are used for sharing and communicating.
2. Integrate an assessment of user needs and expectations as an initial phase of future VRE and digital repository projects. Then have an iterative process for developers and the intended users to communicate throughout the development phases. Require an evaluation plan for the developed systems to be tested with the users as a final phase of each project. The addition of these assessment and evaluation phases may require an extended time line for the research.
3. Build on the findings of previous VRE and digital repository projects. This would involve linking to, expanding, and improving the already-developed systems instead of reinventing new systems. These projects should be collaborative, not involving only one institution, but including many. Scholars often work within their disciplines and not necessarily within their institutions. By involving a larger number of institutions and multiple disciplines, the prospect of the creation of scholarly communities within the VREs and digital repositories increases;

therefore, increasing the opportunities for scholars to adopt and use the systems. The inclusion of diverse disciplines will require options for restricting some information in an open access environment.

4. There is a need for more research to study how to develop VREs and digital repositories that are integrated into the scholars' workflows. Although the systems developed are being used by scholars, they have not been integrated into their workflows. More research addressing how they work and what would entice them to use the systems would be useful.
5. The VREs and digital repositories provide a great opportunity for libraries to market, publicize, and promote their services and offerings. The DSpace institutional repository at MIT is considered a success. This is attributed to the librarians who are responsible for the creation and maintenance of the metadata associated with the digital repository. In order to adopt these services, scholars must know there are advantages for them – either for making their work processes more efficient or for the dissemination and access of relevant information sources.

The copyright of this report is held by the Higher Education Funding Council for England (HEFCE) on behalf of JISC. This work has been issued under a Creative Commons Attribution Non-Commercial No Derivative 2.0 UK: England and Wales Licence. © HEFCE, 2009.

Appendix

Interviewees and Projects (All interviews were conducted by Lynn Silipigni Connaway in 2009)

Interviewee Name: Baker, Mark
Project Name: VRE in Archeology
Project URL: <http://vera.rdg.ac.uk/index.php>
Type of Project: Virtual Research Environment Project
Date of Interview: July 17

Interviewee Name: Betts-Gray, Mary
Project Name: Embed
Project URL: <http://www.cranfield.ac.uk/library/embed>
Type of Project: Repository Project
Date of Interview: July 27

Interviewee Name: Chue Hong, Neil
Project Name: ENGage Academic Groups with E-Infrastructure
Project URL: <http://www.engage.ac.uk/>
Type of Project: Community Engagement Project
Date of Interview: August 10

Interviewee Name: De Roure, David
Project Name: MyExperiment
Project URL: <http://www.myexperiment.org/>
Type of Project: Virtual Research Environment Project
Date of Interview: August 14

Interviewee Name: Fraser, Michael
Project Name: e-Infrastructure Use Cases and Service Usage Models
Project URL: <http://www.eius.ac.uk/>
Type of Project: Virtual Research Environment Project
Date of Interview: August 28

Interviewee Name: Low, Boon
Project Name: UX2.0: Usability and Contemporary User Experience in Digital Libraries
Project URL: <http://research.nesc.ac.uk/projects>
Type of Project: Repository Project
Date of Interview: August 13

Interviewee Name: Poschen, Meik
Project Name: CREW (Collaborative Research Events on the Web)
Project URL: <http://www.crew-vre.net/>
Type of Project: Virtual Research Environment Project
Date of Interview: August 4

Interviewee Name: Proudfoot, Rachel
Project Name: Increasing Repository Content Through Automation and Services
Project URL: <http://eprints.whiterose.ac.uk/increase/>
Type of Project: Repository Project
Date of Interview: July 28

Interviewee Name: Pybus, John
Project Name: Study of Documents and Manuscripts VRE
Project URL: <http://bvreh.humanities.ox.ac.uk/VRE-SDM>
Type of Project: Community Engagement Project
Date of Interview: August 21

Interviewee Name: Sheppard, Nick
Project Name: Personal Engagement with Repositories through Social Networking Applications
Project URL: <http://www.leedsmet.ac.uk/inn/persona>
Type of Project: Repository Project
Date of Interview: August 12

Interviewee Name: Tuner, Martin
Project Name: CREW (Collaborative Research Events on the Web)
Project URL: <http://www.crew-vre.net/>
Type of Project: Virtual Research Environment Project
Date of Interview: July 30

Interviewee Name: Voss, Alex
Project Name: Enabling Uptake of e-Infrastructure Services
Project URL: <http://www.e-researchcommunity.org/projects/e-uptake/>
Type of Project: Community Engagement Project
Date of Interview: August 17