

Pushing the Limits

Building Capacity to Enhance Public Understanding of Math and Science through Rural Libraries

Front-End Evaluation Report

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Background

This is the Front End Evaluation report for *Pushing the Limits: Building Capacity to Enhance Public Understanding of Math and Science through Rural Libraries* (referred to here as *Limits*), a National Science Foundation funded project.

Limits is a community-based Full-Scale Development project that extends the building blocks of science literacy to two new adult audiences: rural librarians and adults in the communities they serve. *Limits* is being developed, created, and disseminated through a partnership between Dartmouth College, the Association of Rural and Small Libraries, The Califa Group (a library consortium), Oregon State University, and Dawson Media Group; it is led by an interdisciplinary team of science, technology, engineering and mathematics (STEM) experts, library professionals and library science educators, informal science education (ISE) developers and researchers, and experienced media makers. The STEM content and the *Limits* project approach have been intentionally designed to engage those rural adults (librarians and the general public) who do not self-identify as “science interested,” and who are in a group typically identified as “underserved” by ISE. The *Limits* project advances discovery and understanding of science and technology while promoting training via the integration of librarian professional development with presentations of ISE programming for the general public.

Front End Evaluation

A national survey of rural librarians and their patrons was carried out between February and April 2011. Key guiding questions were:

- 1) How interested/motivated are rural librarians in:
 - a. Providing science and technology related programming at their libraries;
 - b. Participating in professional development for running public programs;
 - c. Personally learning about science and technology topics.
- 2) How interested/motivated do rural librarians believe their adult patrons will be in attending public programming in general and the four proposed programs in particular?
- 3) How interested/motivated are adult rural library patrons in generally attending public programming and the four proposed themed science and technology programs?

Methods

Participants

Both rural librarians and adult (18 years of age and older) rural library patrons were recruited for this front-end investigation. Rural librarians were recruited primarily through the Association for Rural and Small Libraries's (ARSL). ARSL is a national professional library organization made up of individuals who work in rural libraries. ARSL librarians were invited to participate in an anonymous online survey through the ARSL list-serve; at the time of this research there were 481 active subscribers to the ARSL listserv. In addition, WebJunction, as a community for all library staff, but with a particular mission-driven focus on rural/small libraries, volunteered to also help disseminate the survey. WebJunction included an announcement about the survey in their March Rural Update e-newsletter which was distributed to over 7,000 library staff who had self-selected as being part of the rural/small library community. Initial recruitment was exclusively to librarians; all participating patrons were in turn recruited by the rural librarians. There was no single manner in which librarians were required to recruit patrons; the patron survey URL was distributed to volunteers through a range of library-specific vehicles including library and community newsletters, websites, word-of-mouth, or some combination of these. The final sample included 277 rural librarians and 187 adult rural library patrons.

Survey Development

Online surveys were best suited for both the library staff and their patrons. Most libraries have internet access and could make the survey available conveniently to their patrons or provide them with the URL. Survey instruments were initially developed with input from co-PIs, then further refined using in-depth interviews of 6 adult library staff and their patrons. Six libraries in the local Willamette Valley area were identified by the state librarian and asked if they would be willing to participate in the survey development. The state librarian identified libraries covering a range of service populations under the rural designation. Participating rural librarians were interviewed in person using the draft librarian survey, and also given the draft patron survey to use with a few adult patrons in their library. These draft patron surveys were collected by the librarians and mailed to OSU with no identifying information. The information from the in-depth interviews and the draft patron survey responses was used to finalize the online surveys. The survey instruments were intended to gather descriptive data only. The survey instrument is anonymous and includes both open and closed-ended items. The surveys are not intended to quantifiably measure interests, motivations, knowledge skills, or abilities of library staff or patrons.

Data Collection and Analysis

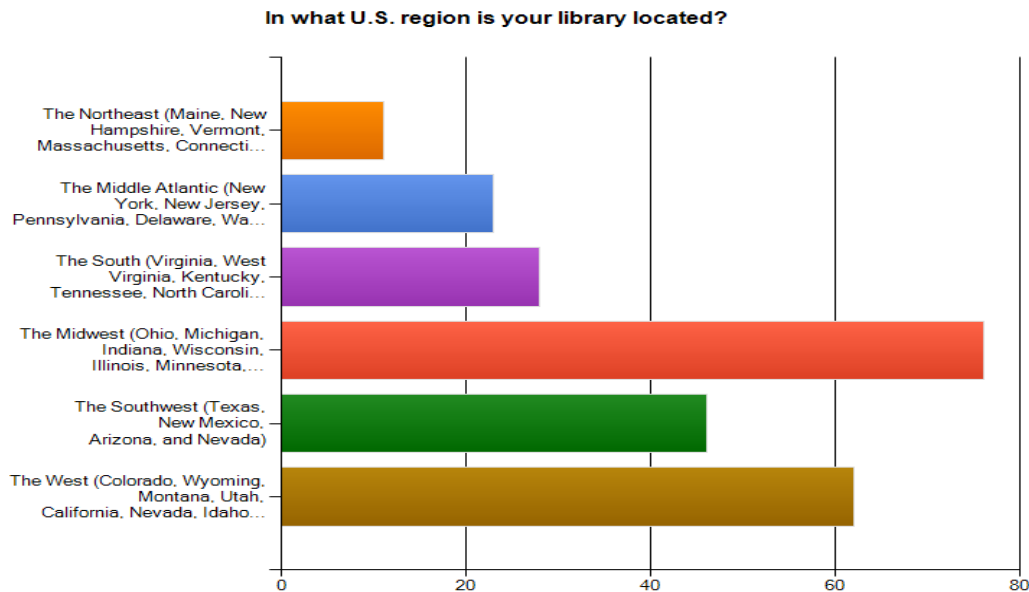
SurveyMonkey was used to administer the surveys. The SurveyMonkey URLs (both librarian URL and patron URL) were sent to rural librarians. All responses were collected via SurveyMonkey online between February and April 2011. The surveys took approximately 15 minutes for library

staff to complete and 5-10 minutes for patrons to complete; as surveys were completed online. Data were analyzed using SurveyMonkey analysis tools and SPSS for descriptive statistics. Some open ended questions were categorized in a spreadsheet and input into SPSS for cross-tabulation. Where helpful, questions with open ended responses were analyzed for content using TagCrowd (phrase frequency count and word cloud generator) for terms that occurred more than once.

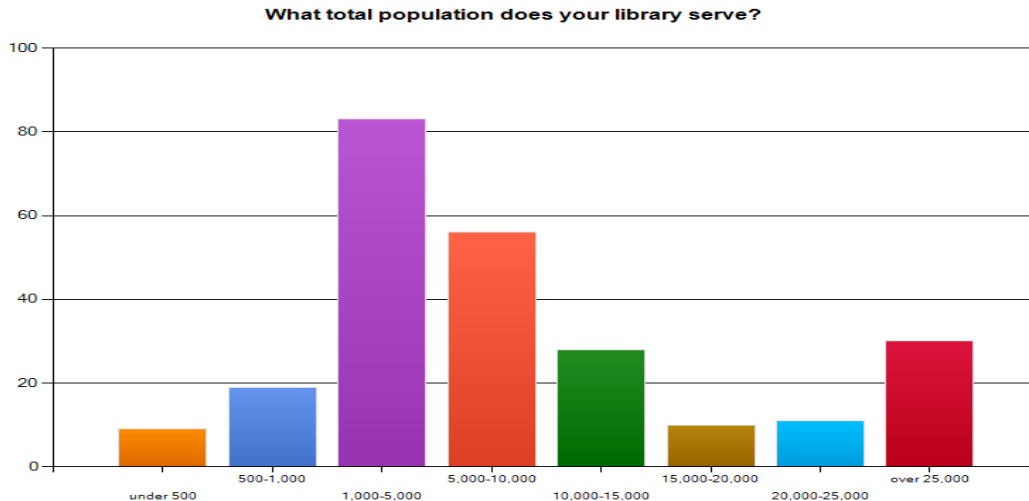
Highlighted Results

Populations Surveyed

The mean age of the 277 librarian respondents was 52 years with a median age of 54 years. Eighty percent of respondents were female. Responses were received from all regions of the U.S. However, given the volunteer nature of the survey, responses cannot be viewed as totally representative of U.S. rural librarians.



The mean age of the 195 adult library patrons who responded was 53 years with a median age of 55 years. Seventy-nine percent of respondents were female. As shown in the figure below, the majority of respondents worked in libraries serving 10,000 or fewer patrons. Although actual statistics of ARSL libraries was not available at this writing, it was assumed these demographics are broadly representative of both rural librarians and rural library patrons.



Key Findings

Rural Librarian Interest/Motivation in Providing Science and Technology Related Programming at their Libraries

Overall, most responding librarians were open to the idea of providing adult programming at their libraries, however the willingness to put in the effort to make a new program such as *Limits* happen was mixed. Some librarians were very excited to provide such programs while others were not at all interested. Many said it depended upon the communities' interest in supporting it (both financially and interest in the specific topic).

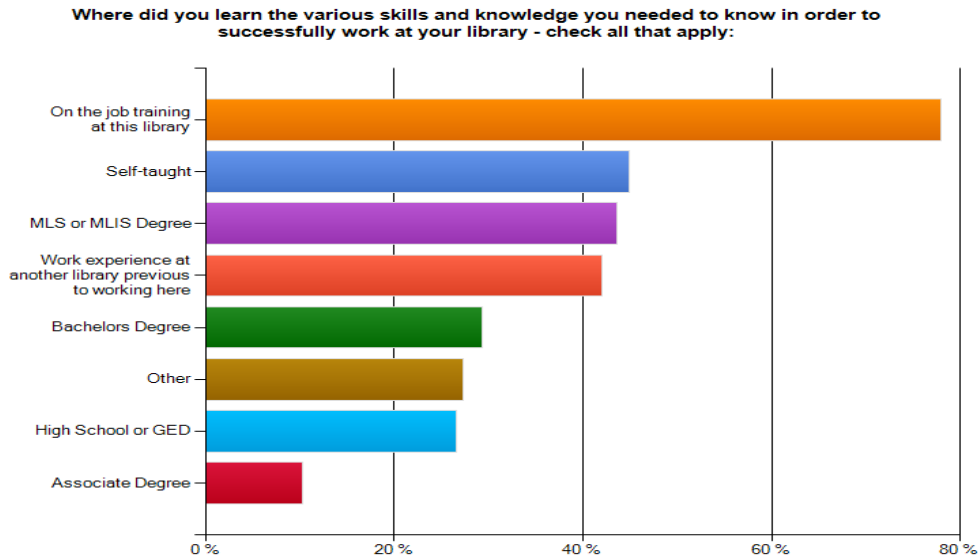
With regard to science and technology programming, librarians most often said they would turn to a local expert such as college faculty, or area government employee for facilitation support in providing such programming.

Most indicated that it would not be easy to identify individuals with appropriate expertise and that it would take some effort to find this kind of support/help.

Librarians cautioned that they considered a big group at a rural library to be 5 or 10 people, but many are still willing to give the program a try. The more financial and material support that can be offered, the more likely they felt they would be able to make a program such as *Limits* happen.

Rural Librarian Interest/Motivation in Participating in Professional Development

As shown below, most of the librarians surveyed are used to getting most of their "training" on the job or through their own efforts (rather than through training).



Librarians were most likely to be interested in professional development if it was scheduled into their work time and they and/or their community was interested in the topic.

With regard to marketing materials, librarians were most interested in receiving templates for email, website, newspapers, posters, and radio announcements. Other resources mentioned as helpful, given time and community/patron interest, included copies of the books for patrons, funds (including to pay for experts), space, experts/speakers, and additional staff.

Rural Librarian Interest/Motivation in Personally Learning about Science and Technology Topics

Librarians in general are individuals who like to learn and they like to help others learn. A large majority of the librarian respondents said they chose to work in a library because they loved helping people and their community and they love books. Librarians commented that aspects of work that fulfilled their personal identity often included helping, assisting, and being of service to people and their community. Librarians commented that helping people, reading books, acquiring knowledge, learning and community service were what motivated them to go to work each day.

When asked what they did not like about the job, librarians often commented that they did not like dealing with difficult people, money issues (budgets, fines), and sometimes computer technology and small town politics.

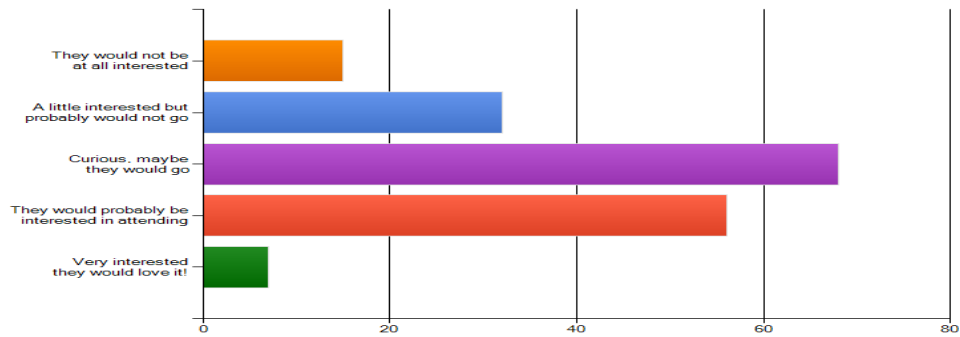
In terms of areas of (intellectual) comfort, most of the librarians in the sample commented that they were most comfortable personally with topics like children’s books, fiction, history and literature. Self-identified comfort with science was

mentioned by some, but comfort with technology was rare. Reinforcing this finding, a large majority commented that the areas they felt most uncomfortable with were helping patrons with topics like computers, genealogy, medicine/health, technology and sometimes science. However, when asked specifically how comfortable they were with helping patrons with science/technology topics, the majority (70%) said they felt comfortable helping patrons finding information related to science content.

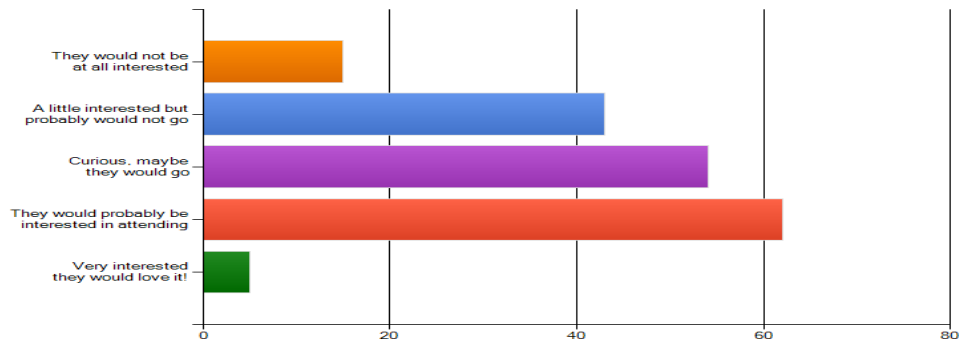
Rural Librarians Opinions About Their Adult Patron’s Interest in Attending Limits Proposed Programs?

The librarians felt their patrons would generally be curious and might attend public science programs like those outlined. Specifically, they felt that “Living on the Edge” and “Nature’s Master” would have more interest for their patrons than “Finding Immortality” and “Endless Knowledge.” Specific responses to the four programs were as follows:

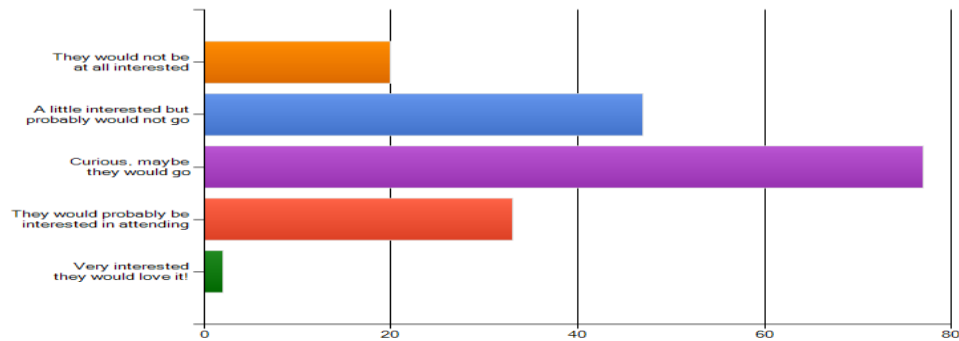
Living on the Edge



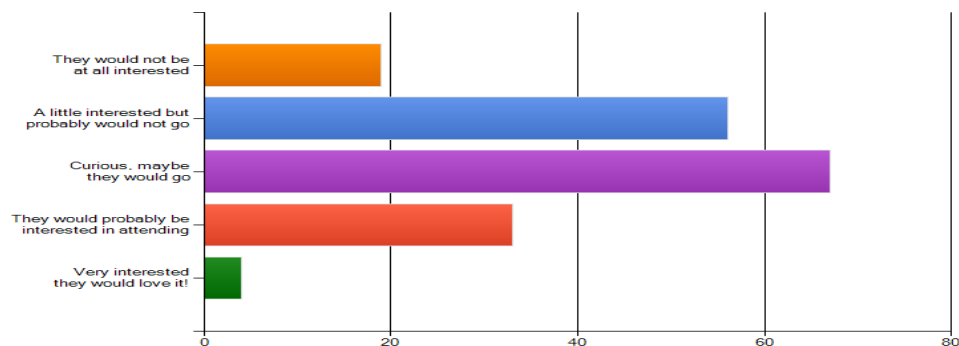
Nature’s Master



Finding Immortality



Endless Knowledge



Librarians mentioned in their comments that some seniors, college educated patrons, teens and students might be more interested in these topics. Also, they felt that some patrons may not be interested due to the esoteric nature of topics (they may want more practical knowledge to help them in life). Professional working patrons might be interested, but might not have the time. Some librarians felt marketing and promotion would have to be very strong to get patrons to actually attend programs.

Librarians also expressed some concerns about the proposed readings, particularly science-fiction; they also queried why non-fiction wasn't being included.

Rural Library Patrons Interest in Attending Public Programs

The majority of respondents (73%) had attended a public program recently. Of the responses that could be coded, the motivations for attending public programs of any kind most often included to "satisfy my curiosity", "discover things about myself" and "acquiring new knowledge in areas they are not expert." Using Falk's identity-related motivation categories,¹ patrons could be categorized as participating in past

¹ Falk, J.H. (2009). *Identity and museum visitor experience*. Walnut Creek, CA: Left Coast Press.

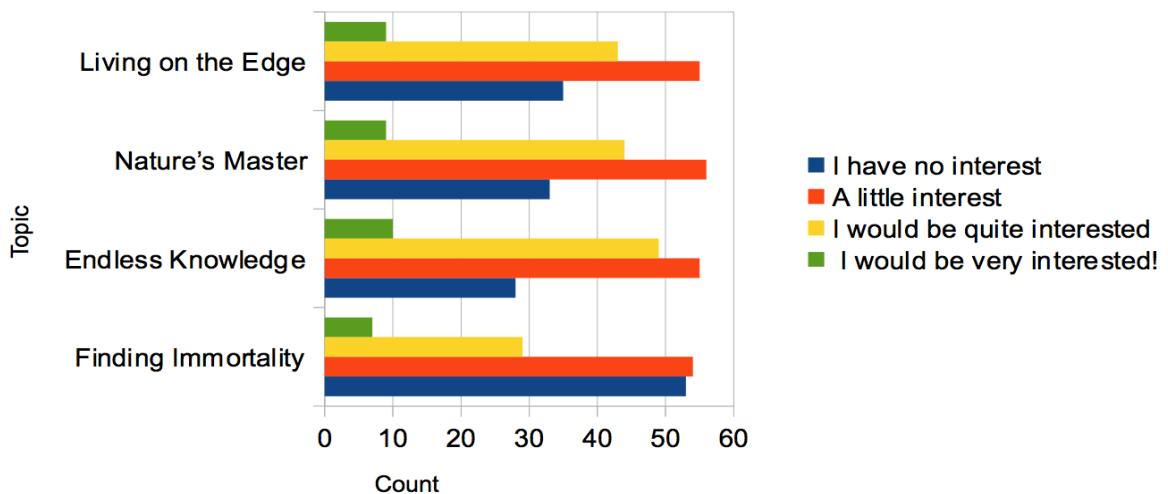
programming in order to meet the following basic needs:

- Explorers – primarily to satisfy general interest/curiosity, to learn more (32%)
- Experience Seekers – to participate in or experience something important (20%)
- Hobbyists/Professionals – to satisfy specific learning goals (19%)
- Facilitators – to support the experience/learning of someone else (17%)
- Recharger – to generally become reinvigorated or inspired (12%)

For those that did not attend public programs recently, the most often cited reasons were lack of time, programs available and interest.

An analysis of rural library patrons’ general topical interests suggests that a general interest in science and technology. For example, rural library users had slightly greater interest in science television viewing than in most other topics; science-fiction television viewing was comparable to other topics. Science and science-fiction topics were of moderate interest in their book choices and about equal to historical fiction and romance; the most popular topic was mysteries.

Of the four proposed *Limits* program topics, patrons were most interested in “Endless Knowledge” and least interested in “Finding Immortality” – but differences across the four topics were not large. As currently described, none of the four proposed topics elicited an enthusiastic response from rural patrons.



Conclusion

We were able to collect data from a large and widely distributed sample of rural librarians and rural library patrons. The data does not represent a true random sample so caution needs to be used in fully generalizing from these findings, none-the-less, the size, make-up and distribution

of the sample provides reasonable confidence in utilizing these findings to make appropriate programmatic decisions related to the *Limits* project.

Overall, rural librarians are committed to learning themselves and to supporting the learning of their patrons. As expected, most did not self-identify science and technology as areas of high interest and expertise. Most felt more comfortable with topics like children's books, fiction, history, and literature. None-the-less, a large majority reported that they felt comfortable supporting their patrons' pursuit of science topics, though were less comfortable with technology. These findings reinforced the operating assumptions of the project that rural librarians represent an important, generally under-represented informal science education target community. Results from the patrons' survey similarly support the assumption that rural adults represent a population that could benefit by improved informal science education.

That said, results from both the librarian and patron survey suggest accomplishing this ISE goal will indeed be challenging. Rural librarians, although generally open to learning more about science and technology, did not overall express a strong commitment to pursuing this kind of personal growth. In addition, learning through support of programs like *Limits* or through professional development were also welcomed, but with caution. The majority of these rural librarians only infrequently engage in professional development and are most indicated "learning on the job" as their most frequent source of professional knowledge.

Most seemed willing to consider implementing the *Limits* project, but most were quick to provide reasons why such an effort would be challenging. They expressed concern about the challenges of finding suitable partners to help with the science and technology support, they expressed concern about attracting large audiences and they expressed concern about the cost and effort that would be required to prepare and advertise the program.

Most seemed to think that the four topics proposed for *Limits* had merit and potentially would be of interest to their patrons, but as above their enthusiasm was restrained. They projected that of the four topics "Living on the Edge" and "Nature's Master" would have more interest for their patrons. The most highly rated of the four topics by patrons was "Endless Knowledge." However, it's important to note that the differences in preference expressed by both librarians and patrons for each of the four topics was relatively modest. As currently described, none of the four proposed topics elicited an enthusiastic response from either rural librarians or patrons. Both librarians and patrons expressed interest in the four specific topics was considerably lower than would have been expected given their general interest in science. This finding suggests that the problem may have been how these topics were presented rather than the topics themselves. Librarians also expressed some concerns about the proposed readings, particularly science-fiction; they also queried why non-fiction wasn't being included.

A couple of interesting points emerge from this data. Librarians were not particularly good at predicting the interests of their patrons; reminding us to take librarian opinions about patrons with a grain of salt. This conclusion was further reinforced by the fact that despite the concerns librarians had about the challenges of attracting rural adults to a program like *Limits*, roughly three-quarters of the

sampled patrons indicated they had recently attended some kind of adult program. The primary motivation expressed by adults for attending these programs was to satisfy their curiosity or generally expand their understanding of the world. Both of these latter findings are positive for *Limits* as they support the hypothesis that *Limits* could potentially be a successful strategy for enhancing public science education, particularly among individuals who do not traditionally consider themselves science interested.

A couple of important take-away messages emerge from these findings. These conclusions are framed from the perspective that it is essential that we attend to these results – both positive and negative, but that we primarily focused on those things that are actually changeable at this time.

- The first is that although *Limits*, as currently conceptualized, does indeed have the potential for fulfilling its goals of engaging rural adults, both librarians and the general public, in learning science through the creation of multiple media and modalities (e.g., film, books and discussions) there remain significant challenges in accomplishing this, several of which are discussed more specifically below.
- A second important take-away is that the four initial themes proposed for *Limits* generated limited excitement from both librarians and patrons. As stated above, it is assumed that the issue is more one of approach than content; how they these programs were framed rather than what they purported to introduce learners too. Specifically, rather than framing these topics as esoteric intellectual discourses (which was clearly how they sounded to this audience), there is a need to make abundantly clear the concrete and immediately relevant nature of each of these programs. This is not to suggest that the topics need to be as concrete as how to mend a fence, can tomatoes or fill-out tax forms, as suggested by some librarians, but they do need to be clearly framed in such a way that someone without a history of academic pursuits can see how this topic might be of interest to them. The results also reinforce the differences between these rural library audiences and the typical PBS crowd! We believe that with an appropriate introduction, readings and framework all of these topics can and would be engaging for this audience, but the programs need to be framed in a way that gets folks to show up in first place (which remains a non-trivial undertaking) and the leaders will need to be primed/trained in such a way that the content/discussion are appropriate to the needs and interests of the audience (also a non-trivial undertaking).
- Arguably one of the most encouraging finding from this front-end, despite the lukewarm response to the topics, was the general willingness of rural adults to participate in adult programming and to do so for reasons consistent with the focus and purpose of *Limits* – to satisfy their curiosity or generally expand their understanding of the world.

Clearly adjustments need to be made to the structure and presentation of the four programs, but these can and are in the processes of being made. Importantly, the data supports the contention that overall, rural librarians are open to the offer of *Limits* but feel the need for additional support in implementation of such a project. Assuming planned for investments are made in supporting rural librarians through

professional development and the marketing and staffing of these programs, there's every reason to believe that the project can and will fulfill its programmatic goals.