

BUILDING BRIDGES: RESTRUCTURING ONLINE LIBRARY TUTORIALS TO SPAN THE GENERATION GAP AND MEET THE NEEDS OF MILLENNIAL STUDENTS

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INTRODUCTION

College students of the Millennial generation present a new challenge to educators -- Millennials' needs and expectations are different from preceding generations. They have a different relationship with technology which translates into different learning styles, and most importantly, different expectations of when, where, and how to learn.

By the late 1990s, online tutorials became popular tools to teach information literacy skills. Western Michigan University (WMU) Libraries was an early adopter, creating the award-winning Searchpath tutorial in 1999. This tutorial has been a highly successful tool with support from faculty who require that students complete it; however, it had not been updated to reflect changes in technology or the pedagogical needs of Millennials. The authors examined the technological needs and expectations of Millennials and found that Searchpath was insufficient in meeting either. We addressed both of these concerns through a re-creation of our tutorial, renaming it ResearchPath, a dynamic audio, visual, and kinesthetic experience that is more responsive to student needs, expectations, and learning styles.

Millennial learning styles and preferences include less lecture time, active learning, flexibility, on-demand learning, task-based assignments, effective use of technology, and incorporating various teaching styles. By reducing the amount of text, increasing interactivity, and shortening the length of time it takes to complete, ResearchPath is more accessible, appealing, and simpler for Millennials. This article shares our findings

regarding Millennial students' needs, expectations, and other characteristics. The results of our study compare the relative effectiveness of the original tutorial with the new tutorial in meeting student learning outcomes and student satisfaction with both content and format. Finally, we recommend strategies for updating, re-creating, and developing tutorials geared towards building bridges to the unique learning styles of Millennial learners.

LITERATURE REVIEW

Literature from the fields of education and library science indicate the Millennial generation, often described as those born from 1982 to 2002, have traits which affect their learning abilities and expectations. Millennials' lifelong use of the Internet and other technologies has affected how they process information and approach academic research (Reith, 2005). They expect experiential, interactive, and "authentic" learning (Oblinger, 2003).

Millennials are "digital natives," having grown up with digital technology, as opposed to "digital immigrants" -- people who adapted to technologies as adults (Prensky, 2001). Said technologies have changed digital natives' thinking and information processing, as well as their learning preferences. Digital natives like to multi-task; prefer graphics over text; prefer random access and hyperlinks over linear presentation of content; work best when networked; and prefer games to "serious" work when learning (Prensky, 2001b). In addition, digital natives have shorter attention spans for traditional education that generally lacks interactivity (Prensky, 2001b). For additional information on Millennials and their characteristics, see our list of resources in our bibliography.

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METHODOLOGY

Two versions of the tutorial exist. The principal designers have identified four phases for usability studies that measure effectiveness and satisfaction of the redesign:

- Student responses to tutorial quizzes (Phase One)
- Student comfort and satisfaction with tutorials (Phase Two)
- Student focus groups (Phase Three)
- Student learning outcomes for information literacy and research skills (Phase Four)

This study was conducted on a sample of students, over 18 years of age. Recruitment was done by print- and web-based advertisements, including the Libraries' Facebook page. Incentives included pizza, soda, and gift cards to the University bookstore. The study used statistical and non-statistical data collection through the use of surveys, quizzes, focus groups and a hypothetical research project.

PROCEDURE

Phases One and Two took place simultaneously. The study identified two groups of participants. Students who had never taken the tutorial were assigned to watch either Searchpath or ResearchPath, and then complete the accompanying quizzes for all six modules. Students who had previously completed a tutorial were asked to complete only certain modules of both Searchpath and ResearchPath, and then complete a survey designed to measure their level of comfort and satisfaction with each tutorial. They were assigned which tutorial to view as they entered the testing site, based on the order in which they arrived. The amount of time required to complete the study varied depending on which phase the subject participated in, and on the individual student. On average, it took students approximately 45-60 minutes to watch the tutorial modules and complete the survey or quiz.

Phase Three, the focus groups, solicited participants from the students who completed Phases One and Two of the study, as well as the general student population of the university, all of whom must have previously completed at least one of the two tutorials. They were asked to elaborate on their opinions of the tutorials. There were eight questions that the interviewers asked the subjects (see Appendix A for the list of questions asked in the focus groups). From there, the interviewers let the subjects lead the discussion with minimal prompts from the interviewers. There were two focus group sessions, each lasting between one and two hours. Demographic data (year of birth and year in school) was also collected, but was kept separate from any identifying information. The focus group conversations were recorded in audio format only.

Phase Four of the study was still in process at the time this article went to print since we did not yet have sufficient subjects to draw a significant conclusion. Students were recruited

who had never completed either of the tutorials. They were asked to complete one of the tutorials, and then to complete a project which simulated parts of a typical undergraduate research project (see Appendix B). Their responses were compared to those of a control group - students who completed the Research Project Simulation but who did not complete one of the tutorials first.

DATA ANALYSIS

Both Searchpath and ResearchPath cover similar concepts. Six modules walked the user through the research process, presenting concepts and skills for effective college research. In each tutorial, any particular module emphasized different aspects of the research process, but overall they are focused on similar, though not identical, learning outcomes. We measured the relative effectiveness of each tutorial based on student quiz scores. Comparing the quiz results gave us quantitative data, allowing us to determine success in specific learning outcomes. However, there were differences not only in the learning outcomes of the two tutorials, but also in the respective quizzes. Therefore the data we gathered demonstrates each tutorial's effectiveness but the tutorials are not directly comparable. We are primarily interested in how ResearchPath met the Millennial learning style.

Students who completed the ResearchPath tutorial generally did better than those who completed Searchpath. Appendix C shows the breakdown of the average scores by each module of the tutorials. There were, in general, fewer quiz questions in the ResearchPath modules than in the Searchpath modules. In many cases, the questions in ResearchPath were simpler and less detailed. Embedded activities and quizzes at the end of the ResearchPath modules were designed to be part of the learning experience. They were not primarily designed to be a graded project, but rather to provide useful feedback and reinforcement of the concepts covered in the tutorial. The hands-on activities in ResearchPath were designed to be in alignment with Millennial learning styles and preferences.

Changes in the ResearchPath tutorial and quizzes were geared towards helping students retain broader concepts, rather than overwhelm them with detailed information. ResearchPath results reflected more successful student outcomes because they had less information that they needed to remember for the quizzes, which is a more effective learning style for the Millennial learner.

Module 5, for example, introduced effective ways to use the Internet for research. Removing outdated and irrelevant information (such as use of the terms FTP and Telnet) increased student success. The quiz results for both tutorials indicate that students tend to be savvy users of the Internet, and understand the different uses of the library resources and the Internet for research. For example, in a question which asked students to identify the appropriate resource, students were able to identify the correct research tool for a given situation. When asked in ResearchPath which source they would use to find "information on the impact of jazz music on rock and roll," eighteen percent identified the Internet as the source they would use. The librarians had assumed

that the correct answer should be “library resources.” This shows a discrepancy in the information expectations of librarians and Millennials, which has caused us to reevaluate the presentation of this concept in the tutorial.

Module 6 introduced students to citation and plagiarism prevention. Searchpath had much more in-depth questions regarding plagiarism and citing sources. As the questions became more specific, the respondents failed to answer correctly. In ResearchPath, the questions were conceptually broader. Even though the material covered in the tutorial was the same, the students were apt to correctly answer the quiz questions. This lends us to believe that an introductory library tutorial such as ResearchPath is more successful for Millennials when topics are broadly introduced.

The data from the User Satisfaction survey consisted of eleven questions, seven of which were open-ended. This information was combined with the data gathered by the focus group sessions to generate a list of Millennial learning preferences reflected in Appendix D. There were fourteen respondents to the User Satisfaction survey, and eight respondents in the focus groups. In all, eighty-five percent of the respondents found ResearchPath more interesting than Searchpath. Seventy-eight percent preferred ResearchPath and found it easier to understand. Most said that they retained the information better from ResearchPath. One respondent flat out said “ResearchPath should become the library’s main tutorial.” The open-ended questions in the User Satisfaction survey were followed up in the focus group sessions.

Self-pacing, interactivity, simplicity, entertainment, and customization are important to Millennials because they have expressed the need to have control over, and to be able to interact with, the online environment for learning purposes. There were nineteen unique responses that identified self-pacing as an important feature. Searchpath allows for users to manually progress through the slides, but ResearchPath is a Flash® video where much of the information is dependent on the user listening to the audio track. Therefore students preferred Searchpath over ResearchPath. Interactivity such as audio was very desirable. However, respondents requested that there be a non-audio version of the tutorial, even though many stated that the audio added value to the learning experience, since it had the potential to slow down faster readers. Various narrators during the videos help them retain focus on the tutorial. “It was if someone were sitting down next to me,” one participant said. The questions and projects integrated into ResearchPath satisfied the Millennials’ need for interaction and hands-on application. Students appreciated the way they “broke up” the tutorial, allowing them to practice certain skills before moving on. Millennials want tutorials to be simpler, straightforward, and more to-the-point. Searchpath was seen as too advanced, overwhelming, and with too much information, yet for some its linear style was appealing. Others expressed a desire for the option to progress in a linear or non-linear fashion, depending on their needs at the time. Students expressed interest in a multi-level program, where they could choose to complete advanced tutorials on specific topics of their choice. It is an “a la carte”

approach to learning, a buffet of information. Millennials also want the content and research examples to be up to date and relevant to their daily lives.

CONCLUSION / WHERE DO WE GO FROM HERE?

ResearchPath was created in order to address the needs and expectations of Millennial students, but it was not until after the tutorial was implemented that we were able to determine if we were successful or not. We continue to revise ResearchPath based on the feedback of our students which, while generally positive, did show some significant areas for improvement. It can be argued that both tutorials adequately prepared students to complete quizzes and to conduct research. The marked improvement in user comfort and satisfaction with ResearchPath over Searchpath is a strong justification for updating any tutorial for the Millennial generation. The students identified the characteristics in Appendix D as important for their learning, and we recommend considering these preferences when updating or creating a tutorial for the Millennial generation.

We are currently conducting Phase Four of our study as described above. We have not yet collected enough data to draw meaningful conclusions, but preliminary data suggest that there is not a great difference between the tutorials’ ability to prepare students to adequately conduct research. However, both tutorials appear to increase students’ ability to conduct research over the control group, who did not complete either tutorial. We will also be conducting an additional study which will use the same set of quiz questions for students regardless of which tutorial they complete. This will measure identical learning outcomes between the two tutorials.

In addition to continuing our study, we will be updating ResearchPath to address the most important concerns expressed by our students, including allowing for a non-linear progression, a more functional self-pacing option, and an option which is less dependent on the audio track. We are also developing an ADA-compliant, text-only version, as well as addressing technical issues which have proved to be frustrating to the users. This project is still in process, and we will continue to update the tutorial based on the expressed (and unexpressed) needs of our students. We recommend that those interested in developing a similar program consult with their own audience through focus groups, surveys, quizzes, and projects. Your students are your best source of information.

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APPENDIX A: FOCUS GROUP DISCUSSION QUESTIONS

1. Which parts of Searchpath / ResearchPath held your interest the most? What did you like about these parts?
2. Which parts of Searchpath / ResearchPath held your interest the least? What did you not like about these parts?
3. What parts of Searchpath / ResearchPath had content that easy to understand? What made it easy to understand?
4. What parts of Searchpath / ResearchPath had content that was hard to understand? What made it hard to understand?
5. What did you think of “the look” of Searchpath / ResearchPath? How would you describe it?
6. What did you like the most about Searchpath / ResearchPath?
7. What did you like the least about Searchpath / ResearchPath?
8. If it was up to you to redesign Searchpath / ResearchPath, what would you add or take away?

APPENDIX B: RESEARCH PROJECT SIMULATION

- Imagine you have been studying the Iraq War in your class, and you have to write a 10 page research paper on an aspect of the Iraq War.
- What aspect will you choose to research?
- What is your research question? (Make sure that your research question is neither too narrow nor too broad).
- Now that you have identified your research question, list at least seven keywords which you can use to search for information on your topic.
- Now, locate one book, one scholarly journal article, and one reputable website for your research paper. List the citations for each. (Your citations do not have to be in standard format, but you should include all standard pieces of information)

APPENDIX C: RESULTS OF TUTORIAL QUIZZES

Module No.	<i>Searchpath</i>				<i>ResearchPath</i>			
	Module Name	No. of Questions	No. of Participants	Total % Questions Correct	Module Name	No. of Questions	No. of Participants	Total % Questions Correct
1	Starting smart	13	11	83%	College-level research	5	9	100%
2	Choosing a topic	13	9	80%	Key research concepts	4	8	75%
3	Using WestCat	13	8	84%	Using the library catalog	4	10	88%
4	Finding articles	12	10	73%	Finding articles	13	11	96%
5	Using the Web	14	10	84%	Using the Internet	6	11	91%
6	Citing sources	12	10	82%	Citing sources	4	11	91%

APPENDIX D: MILLENNIAL LEARNING PREFERENCES

This table shows characteristics which users identified as important, and which tutorial best met the criteria. If neither tutorial was deemed sufficient, "Area for Improvement" was selected.

Millennial Learning Preferences	Searchpath	ResearchPath	Area for Improvement
Self-pacing	X		
Time commitment needed			X
Interactivity		X	
Customization options			X
Amount of information		X	
Choice of information	X		
Linearity ¹		X	
Accessibility	X		
Ease of understanding		X	
Formality		X	
Content relevance		X	
Different formats available			X
Ability to hold attention		X	

¹Students wanted the choice to progress in either a linear or a non-linear fashion.