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Abstract

This article reports on the findings of a study that evaluated the effectiveness of redesigning online information literacy tutorials in order to meet the learning needs and preferences of Millennial students. Using both quantitative and qualitative measures, this study compared two different online tutorials – a static, HTML-based tutorial and a dynamic, interactive, audio/video tutorial. This study found that, contrary to generalizations made in the library and education literature, Millennial students learned equally well from both tutorials. However, students expressed a much higher level of satisfaction from the tutorial designed to be "Millennial friendly."

Keyword Descriptors: Millennials, online tutorials, information literacy, assessment, undergraduates

Running head title: Assessing Online Tutorials for Millennials

Introduction

Researchers across several disciplines have studied how to meet the learning needs and expectations of students in the Millennial generation. They have examined Millennials' preferences, opinions, learning styles, and personality characteristics. These studies have led to new developments in pedagogy and the implementation of new instructional methods. In some cases, this has also led to programmatic-level or even institutional-level changes in curriculum.

Libraries have also embraced these changes in pedagogy, often redesigning online information literacy tutorials to meet the needs of Millennial students.   Surprisingly, there is a lack of research that compares the effectiveness in meeting student learning outcomes of older, static, HTML online information literacy tutorials with those designed to be "Millennial friendly."   This article explores characteristics of effective online tutorials for Millennial students, and it examines the assumption that Millennial students will learn more from online tutorials designed for them. This research study compares both the learning outcomes and preferences of undergraduate students who viewed two different online information literacy tutorials at Western Michigan University.

Background

Western Michigan University (WMU) is a public university with approximately 20,000 undergraduate and 5,000 graduate students. According to the WMU Office of Institutional Research, 97.19% of full-time, degree-seeking undergraduate students were born after 1982, and therefore belong to the Millennial generation. In addition, 93.69% of full-time, degree-

seeking undergraduate students are between the ages of 17 and 25, the ages of "traditional" college students. The WMU Libraries have long focused on improving students' information literacy and research competence. In 2010, the WMU administration officially acknowledged the importance of information literacy by including it in its list of essential skills, knowledge, and attitudes to be integrated into the undergraduate curriculum (Western Michigan University 2010). This support has enabled the WMU Libraries to increase their efforts to improve student learning of information literacy skills, ensuring that WMU continues to graduate information literate individuals.

WMU Online Library Tutorials

With the creation of Searchpath in 1999-2000, WMU became an early adopter of online tutorials as a means of delivering information literacy instruction to students. Searchpath was an expansion of the TILT tutorial, developed by the University of Texas. The Searchpath tutorial consisted of six modules introducing students to broad information literacy concepts (as defined by the Information Literacy Competency Standards for Higher Education) and specific concepts on how to conduct research at WMU (Association of College and Research Libraries 2000). Each module was followed by a quiz, with students given the option to forward their quiz scores to an instructor. Many instructors required students to complete the tutorial or offered extra credit as an incentive. Searchpath consisted of a series of static HTML webpages, which students navigated at their own pace. While it was regularly updated to reflect changes in content and available resources, the structure and format did not change for ten years.

In 2009, Searchpath was replaced by a new tutorial called ResearchPath, created using Adobe Captivate, which allowed for the incorporation of animation, video, audio, and interactivity. The ResearchPath tutorial was developed using best practices for Millennial learners, addressing visual, auditory, and kinesthetic learning styles. Like its predecessor, ResearchPath consists of six instructional modules and quizzes. It is currently available to the public on the WMU Libraries website and to WMU students and faculty through the online learning management system (Elearning). As of the Spring 2012 semester, 4,355 students from 207 classes had registered to use ResearchPath.

In order to measure how well this new tutorial helped students learn information literacy concepts, we conducted a pilot study in 2009. We compared student learning and satisfaction among participants who viewed the two tutorials through an analysis of quiz scores and comments in focus groups. The results of this pilot study informed the 2011 revisions of the ResearchPath tutorial.

Literature Review

The authors conducted a thorough review of the literature for two primary purposes: to inform our creation of the ResearchPath tutorial according to best practices for Millennial students, and to contextualize our assessment of ResearchPath's effectiveness in meeting student learning outcomes and preferences.   We searched the education and library science literature for studies about educating Millennials, online tutorials, and best practices for creating online tutorials for Millennials. Although numerous articles detailed the effectiveness of specific tutorials, surprisingly, we were unable to find any articles directly comparing student

learning outcomes in an old, static, HTML tutorial with a "Millennial friendly" tutorial. Rather, the majority of articles focused on student preferences and on how effectively *specific* tutorials taught students information literacy skills (Mestre 2010; Friehs and Craig 2008; Armstrong and Georgas 2010; Befus and Byrne 2011). Given this gap in the literature, we designed our study to explore possible impacts of updating an information literacy tutorial for Millennials.

Educating the Millennial Generation

In order to investigate how well our current students learn from and feel about our new tutorial, we first must identify the educational characteristics of Millennials. The Millennial Generation, often described as those born from 1982 to 2002, typically has certain attributes that impact its learning styles and expectations. Millennials' lifelong use of the Internet and other technologies has affected how they process information and approach academic research (Prensky 2001a; Reith 2005). They expect experiential, interactive, and "authentic" learning with practical applications (Oblinger 2003). As a result, they are comfortable with using, and even expect to use, technology in their daily lives (Prensky 2001a). These students 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. In addition, they have shorter attention spans for traditional education that lacks interactivity (Prensky 2001b). Many believe that educational materials designed for Millennial students should first and foremost be interactive. Prensky notes that educators often include games in their online instructional materials, but these must be "*real* games, not just drill[s] with eye-candy, combined creatively with *real* content" (Prensky 2001b).

As a generation, Millennials "may be on track to emerge as the most educated generation ever" (Taylor and Keeter 2010). More Millennials have graduated from, are currently enrolled in, or plan to enroll in, college than their counterparts in earlier generations. This makes understanding their learning wants and needs important – as students, they are and will continue to have a presence on campuses. Technology-based instruction, such as online tutorials, should especially receive attention since it has the potential to be particularly appealing to Millennials (Oblinger).

Online Information Literacy Tutorials

Generally, Millennials' preferences in face-to-face learning modalities are consistent with what they expect from online tutorials. Almost all of the case studies and research articles we found did not explicitly state that they studied Millennials. However, it is reasonable to assume that the majority of participants in these studies fell into the typical age range for college students – 18 to 24 years of age – which would make these students part of the Millennial generation. Therefore, we can apply these findings to our study of Millennial students.

When studying students' reactions to tutorial formats, Mestre finds that students preferred tutorials that included both images and sound, were visually engaging, interactive, available at the point-of-need, and allowed for self-navigation through the tutorial. Friehs and Craig report that students appreciated brief tutorials that included streaming video and audio. Interestingly, Friehs and Craig find that students did not mind a lack of interactivity in online tutorials, contrary to many other studies about Millennial learning styles.

How effective are online tutorials in meeting desired student learning outcomes for Millennials? Armstrong and Georgas tested the effectiveness of their online tutorial by administering a pre- and post-test to students who viewed the tutorial. Since they found that student performance improved after viewing the tutorial, they concluded that their tutorial was successful. It is worth noting, however, that this study does not compare the effectiveness of the tutorial with other modes of instruction, including other tutorial formats. They did note, however, that their findings supported many of the ideas set out in the seminal research studies by Dewald (1999) and MacDonald et al. (2001), which argue that successful online tutorials are interactive, have a visually engaging style, emphasize active learning, and include concept-based games. Befus and Byrne assessed the effectiveness of an online information literacy tutorial in order to address the needs of Millennial students. Although they included Millennial-friendly features in the tutorial, Befus and Byrne found that the tutorial was not as effective as hoped, since students did not perform as well as expected on a post-test.

Creating Online Tutorials – Best Practices

Generally, best practices for designing online tutorials for Millennials include accommodating their preferred learning styles, using interactive learning, multimedia components, and nonlinear content. Bury and Oud (2005) conducted a usability study in which their student participants indicated a preference for a tutorial that was (1) visually appealing, (2) had less static text, (3) included progressive cues, (4) was short, to the point, and avoided excessive repetition, and (5) had hands-on exercises, ungraded self-tests, and general interactivity. In response to student feedback on the usability of online tutorials, Bowles-Terry

et al. (2010) developed a list of best practices recommending that tutorials be kept simple, straightforward, and informational. In addition, tutorial segments should be short (generally between thirty and sixty seconds in length), and information and concepts should be presented in multiple formats, such as text, video, and audio. However, even though these studies proved useful in guiding our tutorial design, they did not compare similar learning outcomes of students who completed a "Millennial friendly" tutorial with those of students who completed a traditional, static HTML tutorial.

Methodology

There were few models to draw on for comparing the effectiveness of "traditional" and "Millennial friendly" information literacy tutorials. In order to measure the effectiveness of the ResearchPath tutorial, we therefore created a three-phase study that included control and experiment groups to gather quantitative data, and focus groups to collect qualitative data.   All three phases limited participation to currently-enrolled undergraduate students at WMU. Experts at the WMU Statistical Consulting Center recommended an appropriate sample size, based on the information gathered in the 2009 pilot study.

We were awarded an Assessment Grant from the WMU Office of Institutional Effectiveness, which enabled us to provide monetary incentives for students to participate in the study. In the fall of 2011, we recruited students through a variety of media including advertising in fliers, on the Libraries' website, on closed-circuit TVs in the main library, and on the Libraries' Facebook page. We renewed these advertisements prior to the start of each phase of the study. Between October and December 2011, the investigators proctored all three

phases of the study at Waldo Library, WMU's main library. After informing interested students

of available time slots, we registered them on a first-come-first-served basis. All participants

accepted the terms of an Informed Consent agreement, and they provided their gender and

year of birth for demographic purposes.

Phase One – Quiz

We recruited thirty students for Phase One. Students were permitted to participate

only if they had never taken either version of the WMU online information literacy tutorial, in

order to control for the variable of different levels of prior knowledge. By offering multiple

sessions, we were able to accommodate students' differing schedules. At the test site, we

assigned participants a number based on the order in which they arrived. We assigned odd-

numbered students to the original Searchpath tutorial and even-numbered students to the

revised ResearchPath tutorial. After watching their assigned tutorial, all participants completed

the same multiple-choice quiz (see Appendix A) using the online survey tool, Survey Monkey.

We designed this quiz to assess students' understanding of the information literacy facts and

concepts presented in the tutorials. Participants took between thirty and forty-five minutes to

complete this phase of the study, for which they received a $15 cash incentive. For statistical

analysis, we treated the questions marked "check all that apply" differently than the other

multiple choice questions (with only one possible response). We treated each possible answer

as a separate question, with a single "correct" or "incorrect" grade.

Phase Two – Hypothetical Research Project

For Phase Two of this study, we recruited thirty new participants who had never taken either of the WMU online information literacy tutorials. Again, we asked half of the participants to complete the original Searchpath tutorial and the other half the ResearchPath tutorial. We then gave all participants the same hypothetical research project (see Appendix B) which asked them what they would do in each step of the research process. ==Participants completed a series of searches using online library resources and the internet, and recorded their results on a paper form. Participants took approximately sixty minutes to complete this portion of the study and they received a $20 cash incentive for doing so.== We coded the completed hypothetical research projects according to a rubric and assigned each question a numerical score ==(see Appendix C).== For statistical analysis, questions that had two parts were treated as two separate questions.

Statistical Analysis – Phases One and Two

For the first two phases of this study, we ran a series of statistical tests in order to determine if there were relationships between student performance and student demographic characteristics. ==We conducted independent samples *t*-tests (comparing mean scores of two groups on a given variable) to determine if there were relationships between gender and performance. We conducted a one-way ANOVA (comparing mean scores of two or more groups on a given variable) to determine if there was a relationship between class standing and performance. We calculated Pearson Product-Moment Correlation Coefficients (measuring the relationship between two variables) in order to determine if there were linear relationships between age and performance. In addition, we conducted independent samples *t*-tests to==

determine if there were statistically significant differences in performance between the Searchpath and the ResearchPath groups. We also conducted chi-square analyses (comparing observed data with expected data) in order to determine if there were differences in performance on individual questions between the Searchpath and ResearchPath groups.

Phase Three – Focus Groups

While the first two phases of this research study focused on assessing student learning outcomes, Phase Three investigated student preferences about the tutorials. We chose to gather qualitative data about student preferences by holding a series of focus groups. This format allowed us to gather open-ended feedback and suggestions for improvement from participants. It also allowed us to follow up student responses in real-time in order to build a more detailed understanding of their preferences and opinions. We conducted three focus group sessions, with four student participants in each session. For this phase, students could participate regardless of having previously taken one of the online information literacy tutorials. During each session, we asked participants to watch *both* online tutorials, which took most participants approximately sixty minutes. They then participated in a discussion led by two of the principal investigators. The investigators asked a series of prepared questions to all three groups, as well as a series of non-standard follow-up questions based on issues that arose during the course of the discussions (prepared questions can be found in Appendix D). Each discussion lasted about sixty minutes and was recorded using a digital audio recorder. We provided participants with pizza and snacks during the discussion along with a $25 cash

incentive. In transcribing the audio recordings, we identified commonly-expressed ideas and themes for qualitative analysis.

Results and Discussion

The results of this research study were somewhat unexpected. Despite the "Millennial friendly" characteristics of the revised ResearchPath tutorial, we found very little difference in student learning outcomes connected to the two tutorials. However, we did find a marked difference in student satisfaction, with participants indicating a strong overall preference for the newer ResearchPath tutorial.

Phase One – Quiz

SPSS statistical software was used to analyze the data from the quizzes in Phase One. An independent samples *t*-test revealed no significant relationship between gender and performance on the quiz (t= .368, p= .716). A one-way ANOVA comparing performance among freshmen, sophomores, juniors, and seniors revealed no significant difference in mean quiz scores (F= .319, p=.811). Further, a Pearson Product-Moment Correlation Coefficient (Pearson's *r*) revealed no linear relationship between age and performance on the quiz (r= -.084, p= .670).

The mean quiz scores for Phase One participants can be seen in Figure 1. Participants who took the updated ResearchPath tutorial performed slightly better (mean= 82.5%) compared with the Searchpath participants (mean= 78.5%). Nevertheless, an independent samples *t*-test did not reveal this difference to be statistically significant (t=1.133, p= .267).

Figure 1: Mean Quiz Scores (Phase One)

Table 1: Independent Samples t-test on Quiz Scores

Chi-square analyses were conducted on individual quiz questions in order to determine if there were differences in performance between the Searchpath and ResearchPath groups. Results revealed that participants who completed the new ResearchPath tutorial performed significantly better than those who completed the original Searchpath tutorial on question 9A (p= .032). Students who completed the newer ResearchPath tutorial performed *marginally* significantly better than their Searchpath counterparts on questions 5 (p= .099), and 7 (p= .068). However, the students who completed the Searchpath tutorial actually performed marginally significantly better on question 18 (p= 0.58). Figure 2 shows the relative performance of the two groups on each of these questions. These results suggest that some concepts were more effectively presented in one tutorial compared with the other, leading to greater student comprehension and retention of information.

FIGURE 2: Number of Participants who Responded Correctly (Phase One)

TABLE 2: Chi-Square Test Results for Quiz Questions (Phase One)

Phase Two – Hypothetical Research Project

As with the quiz results from Phase One, we analyzed the coded scores for the hypothetical research project using SPSS statistical software. An independent samples *t*-test

revealed no significant relationship between gender and performance (t= -.301, p= .768), and a Pearson's r revealed no linear relationship between age and performance (r= -.042, p= .840).

The mean scores for the two groups can be seen in Figure 3. Participants who completed the new ResearchPath tutorial performed slightly better on the project (mean= 80.5%) than those who completed the original Searchpath tutorial (mean= 76.4%). However, an independent samples t-test did not reveal a statistically significant difference (t= -1.109, p= .278).

Comment [R1]: Figure three says 80.6 not 80.5

FIGURE 3: Mean Project Scores (Phase Two)

TABLE 3: Independent Samples t-test on Project Scores (Phase Two)

Chi-square analyses were conducted in order to determine if there were differences in performance on individual questions between the Searchpath and ResearchPath groups. Only one question, 13B, showed a marginally significant difference (p= .057). This was unexpected, and perhaps even contradictory, since both questions 13A and 13B were, in effect, asking students to perform the same task – that is, to identify the best websites for their research topic from a list of search results. Although unusual, there is no guarantee that students will choose equally appropriate sites for each question. Therefore, it is possible that the students' performance would be different for each question. It is unclear why this is so; however, a possible explanation might be that the ResearchPath tutorial was more effective in helping students understand how to evaluate websites, enabling them to identify multiple appropriate

sites for research. This would imply that Searchpath was not as effective; if this is the case, students would be less able to select more than one appropriate website.

Phase Three – Focus Groups

Unlike the data collected from the first two phases of this study, Phase Three (focus groups) showed a dramatic difference between the two tutorials. The focus groups were designed to measure student preference and satisfaction rather than student learning. Since all participants in this phase of the study viewed *both* tutorials, they were able to compare the two tutorials and offer perspective and suggestions. Overall, participants indicated a strong preference for the newer ResearchPath tutorial.

We reviewed the focus group recordings and identified the commonly-expressed themes. The majority of participants indicated the characteristics in Table 4 as ones that they particularly liked or disliked about the tutorials.

TABLE 4: Tutorial Characteristics – Participants Likes and Dislikes

It is worth noting that while students liked the interactivity in both tutorials, they wanted even *more*. This desire for interactive, hands-on learning corresponds with best practices and Millennial learning preferences outlined in the literature. Students also desired personal control and ease-of-use. They enjoyed the self-pacing of the original Searchpath tutorial, while they felt that they did not have enough control to rewind or move forward in the new ResearchPath tutorial. This may be due to the fact that ResearchPath has an audio

voiceover, which students will miss if they try to skip ahead. It may also be due to the fact that users *must* use the prominently displayed "forward" and "back" navigation controls on the Searchpath tutorial. Conversely, the playback controls for the ResearchPath tutorial are not as obvious, since users do not need them in order to view the tutorial.

Overall, students indicated that they were much more engaged when viewing ResearchPath than when using Searchpath. They particularly enjoyed the animation and the combination of visual and auditory material. In contrast, commonly used words to describe the Searchpath tutorial were "boring" and "text-heavy," something which we expected due to anecdotal comments made by students over the years. Students also commented positively on the way in which the new ResearchPath tutorial was "branded" to WMU – they were especially enthusiastic about the use of WMU's school colors, voiceover narratives provided by WMU theatre students, and the connections with other campus resources (such as the WMU Writing Center).

Conclusion

Despite the fact that student learning outcomes did not significantly increase between the two tutorials, the strong preference that Millennial students indicated for ResearchPath is sufficient justification for updating instructional materials such as online tutorials. Even if students are able to learn equally well from the two different styles of tutorials, they will be much happier and more engaged in the research process if they remain interested. Providing students with learning experiences that they perceive as engaging and fun will also inevitably improve their opinions of both the library and the research process. This could potentially lead

to a greater willingness on the part of students to seek out library resources or request assistance from librarians. Although the primary goal of any Millennial-friendly tutorial must be to meet student learning outcomes, it can also be an important tool to promote positive feelings toward the library.

On the surface, this study suggests that students are able to learn equally well regardless of the format of the online tutorial. However, we must consider the possibility that the artificial environment created by the proctored research study was not an accurate reflection of the way students learn in "real life." Students who are being paid to participate in an experiment are likely to approach the tutorial and tasks in a different way than students who are viewing a tutorial for their own learning or in order to meet a course requirement.

The next step for our research is to update the ResearchPath tutorial based on the results of this study, and then examine "real life" student learning outcomes. Beginning in the Spring 2012 semester, ResearchPath became accessible to all WMU students through the new learning management system (Elearning). This system tracks student performance on the ResearchPath quizzes, and it can provide us with reports for analysis. From these data we will be able to determine where students are having difficulties, if any, when learning particular concepts covered by the revised tutorial. We will also be able to deduce which parts of the tutorial need further revision. In addition to providing us with "real life" data, this system will allow us to track the performance of *all* WMU students – thousands each year – who complete the tutorial and quizzes. With this large sample size, we anticipate being able to draw more conclusions about the way Millennial students learn.

We are exploring other approaches to assessing ResearchPath. One possible method is to conduct additional "scenario-based" analysis of student learning by asking a random sample of all participants to respond to a single question. The single question would ask students to explain how they would approach a particular research situation, allowing us to evaluate their ability to apply the concepts covered in the tutorial. This format of assessment would enable us to gather responses from a large number of students at once, and track changes in student performance over time.

In addition to updating the ResearchPath modules and quizzes based on the results of this study, we have also begun to develop additional online tutorials to address concepts identified by focus group participants as being potentially useful. We have created "demonstration" modules for topics such as submitting interlibrary loan requests or using citation management software. We have also created more specific, concept-based tutorials, for example, a tutorial about identifying and searching for primary source materials in history.

Our study, and other tutorial studies we examined in the literature, raised the question of how to implement best practices for online information literacy tutorials. There are no clearly articulated standards of what those best practices look like. For example, what constitutes sufficient "interactivity" in an online tutorial for Millennial students? This lack of specificity makes it difficult to compare different case studies in order to draw conclusions about current trends in effective online information literacy tutorials.

Regardless of the library initiative, it is important to assess whether the intended goals, such as student learning outcomes, have been met. Ideally, one should assess in real life situations to avoid unintended or unconscious bias. This need for regular assessment will

continue to be vital to accurately gauge students' wants and needs as the Millennial generation

graduates from college and the new generation, which some are calling the iGeneration or

Generation Z, arrives on campus.

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Appendix A – Quiz (Phase One)

1. I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

    A. I Agree (continue with study)

    B. I Disagree (decline to continue with study)

2. Are you male or female?

3. What is your class standing?

4. What year were you born?

5. Which is the best place to begin searching for scholarly or academic resources?

    A. Library

    B. Web

    C. Neither

    D. Both

6. Which of the following emphasizes QUANTITY over QUALITY?

    A. Library

    B. Web

    C. Neither

    D. Both

7. Which of the following is more likely to charge you money to access scholarly or academic resources?

A. Library

B. Web

C. Neither

D. Both

8. Which of the following selects only the more reliable resources?

A. Library

B. Web

9. When brainstorming key words or concepts that describe your topic, you should include:

A. Synonyms

B. Abbreviations

C. Alternate endings

D. Singular and plurals

E. Antonyms

F. Alternate spellings

10. Imagine you are searching the Library Catalog (or WestCat) for a book on alternative fuels and race cars. You should use:

A. Basic Search

B. Advanced Search

11. Imagine you are searching the Library Catalog (or WestCat) for the book "Harry Potter and the Prisoner of Azkaban". You should use:

A. Basic Search

B. Advanced Search

12. When searching the Library Catalog (or WestCat) for books by Stephen King, which format of the author's name should you use?

   A. Stephen King

   B. King, Stephen

   C. It doesn't matter

13. In which of the following places can you search for journal articles?

   A. Library Catalog (WestCat)

   B. Databases or Article Indexes

   C. Both

14. Which of the following is most likely to contain many glossy, full-color photographs:

   A. Popular magazine

   B. Scholarly journal

15. Which of the following is most likely to contain substantial bibliography and/or footnotes:

   A. Popular magazine

   B. Scholarly journal

16. Which of the following is most likely to be written by experts in a particular field of study:

   A. Popular magazine

   B. Scholarly journal

17. Which of the following is most likely to be intended to be read by the general public:

A. Popular magazine

B. Scholarly journal

18. Imagine you are writing a paper for your Abnormal Psychology class. What is the best way to find journal articles on your specific topic?

A. Use the library Catalog (WestCat)

B. Use the ProQuest Research Library database

C. Select a database from the Psychology Subject Guide

19. You have found some information on the Internet about your research topic. Which of the methods are good ways to determine whether or not the information is reliable and appropriate for college-level research? (Select all that apply)

A. Evaluate the information's accuracy

B. Make sure the information is presented objectively and without bias.

C. Assess how persuasive the writing is.

D. Evaluate the web page layout for ease of use.

E. Focus on how current the information is.

F. Determine if the author is an expert on the topic

20. You are writing a research paper. In the paper you discuss an idea you read about in Origin of Species by Charles Darwin, but do not quote directly from the book. In your paper you...

A. Should cite Darwin's book

B. Don't need to cite Darwin's book

21. For a research paper, you use a brief quotation from an article in the newspaper, "The New York Times". In your paper you...

A. Should cite the New York Times article

    B.   Don't need to cite the New York Times article

22. Your professor has told you to use the APA citation style for your assignment. What resource(s) should you use to find out how to format your citations in this format? (Check all that apply)

    A.   Refer to a writing style manual

    B.   Consult the Library website

    C.   Ask someone at WMU's Writing Center

Appendix B – Hypothetical Research Project (Phase Two)

WMU Libraries 2011-2012 online tutorial research study

Year of birth: _____   Are you: Male   Female

1. Imagine that you have been asked to write a 10 page research paper. Your assignment is to write about **"something to do with climate change."** This paper is for an introductory-level class. You will have 5 weeks to complete the project. Write down a *manageable* research question based on the topic "climate change".

You are required to find 2 books, 2 scholarly articles, and 2 reliable websites. All of your information should be appropriate for a college-level research project.

Begin your search for 2 books and answer the questions below:

2. Where did you search for books? What databases/search engines did you use? What did you type in to the databases/search engines for your search?

3. Print the first page of your search results and attach to this paper.

4. Circle the 2 book titles that you think are most appropriate for this project. Tell us why you think they are the most appropriate:

5. Write an X through two book titles that you think are not appropriate for this project. Tell us why you think they are not appropriate:

Begin your search for 2 articles and answer the questions below:

6. Where did you search for articles? What databases/search engines did you use? What did you type in to the databases/search engines for your search?

7. Print the first page of your search results and attach to this paper.

8. Circle the 2 article titles that you think are most appropriate for this project. Tell us why you think they are the most appropriate:

9. Do you think these articles are scholarly? Why or why not?

10. Write an X through two article titles that you think are not appropriate for this project. Tell us why you think they are not appropriate:

Begin your search for 2 websites and answer the questions below:

11. Where did you search for websites? What search engine(s) did you use? What did you type in to search for?

12. Print the first page of your search results and attach to this paper.

13. Circle the 2 websites titles that you think are most appropriate for this project. Tell us why you think they are the most appropriate:

14. Write an X through two websites titles that you think are not appropriate for this project. Tell us why you think they are not appropriate:

Citations: Read the following excerpt from an article

Bunyard, P. (2004). Crossing the Threshold. *The Ecologist, 34*(1), 55-58.

"Since 1990 we have experienced the warmest 10 years on record. This has left some parts of the world ravaged by drought and famine, and others suffering freak storms such as those that flooded much of lowland Britain in 2000. France, having experienced a devastatingly hot summer in 2003 then found itself enduring torrential winter rains and unprecedented floods. According to Phil Jones, head of the Climatic Research Unit of the University of East Anglia, the three months of June, July and August 2003 were the warmest ever recorded in western and central Europe. The average temperature for those months was nearly 4° centigrade above the long-term norm and breaking records everywhere – including the UK, where temperatures exceeded the 100° Fahrenheit mark for the first time."

Imagine that you are including each of the following statements in your research paper. Circle the correct option for indicating whether you do or do not need a citation.

15. The increase of average global temperature during the last decade of the twentieth century has resulted in dramatic changes in weather around the world.

      Needs a citation   Does not need a citation

16. According to Phil Jones, head of the Climatic Research Unit of the University of East Anglia, the three months of June, July and August 2003 were the warmest ever recorded in western and central Europe.

      Needs a citation   Does not need a citation

17. A climatologist in England says that the summer of 2003 was the hottest ever in Europe.

      Needs a citation   Does not need a citation

18. In 2003, the temperature in the United Kingdom rose to over 100° Fahrenheit.

      Needs a citation   Does not need a citation

Appendix C – Rubric for Coding Hypothetical Research Project (Phase Two)

Question 1: Imagine that you have been asked to write a 10-page research paper. Your assignment is to write about **"something to do with climate change."** This paper is for an introductory-level class. You will have 5 weeks to complete the project. Write down a *manageable* research question based on the topic "climate change".					
Performance Indicator	**Poor (1 point)**	**Fair (2 points)**	**Satisfactory (3 points)**	**Good (4 points)**	**Excellent (5 points)**
Formulates manageable research question given project parameters.	Did not form a research question OR research question mentions "climate change" but does not refine further, OR topic is too narrow, impossible to complete given assignment parameters, e.g., "how did climate change in the last month in Kalamazoo, Michigan?"	Research question is more refined than "climate change", but still too broad to be manageable, e.g., "what factors contribute to climate change?"	Research question addressed one additional concept besides "climate change," but the concept is still quite broad, e.g., "what is the impact of climate change in Asia?"	Research question addressed two concepts besides "climate change," but concepts are still quite broad, e.g., "what is the impact of climate change on animals in Asia?"	Research question addressed two additional concepts besides "climate change," and the concepts were specific enough to result in a manageable search, e.g., "what is the impact of climate change on birds in China?

You are required to find 2 books, 2 scholarly articles, and 2 reliable websites. All of your information should be appropriate for a college-level research project. **Begin your search for 2 books and answer the questions below:** [these instructions applied to questions 2 through 5] **Question 2:** Where did you search for books? What databases/search engines did you use? What did you type in to the databases/search engines for your search?			
Performance Indicator	**Poor (1 point)**	**Satisfactory (2 points)**	**Excellent (3 points)**

Identifies appropriate information source.	Identified resource not appropriate for finding books (and is not from library) or did not identify any resource.	Identified a library resource but not one that is best for finding books.	Identified library resource appropriate for finding books (catalog power search).
Identifies appropriate search terms.	Used keywords that would not return useful or relevant results based on research question.	Used keywords that would return less useful but potentially relevant, results based on research question.	Used keywords that would return useful results based on research question.

Question 3: Print the first page of your search results and attach to this paper.
No points were awarded for this question.

Question 4: Circle the 2 book titles that you think are most appropriate for this project. Tell us why you think they are the most appropriate.		
Performance Indicator	**Poor (1 point)**	**Satisfactory (2 points)**
Identifies appropriate source type.	Did not pick a book.	Picked a book.
Determines appropriateness of source for project.	Not relevant/appropriate.	Relevant/appropriate to project.
Articulates appropriateness of source.	Not a good explanation of why item is appropriate.	Good, cogent explanation that reflects a sense of the topic; or identified some inherent weakness in the item (i.e. not a book, etc.).

Question 5: Write an X through two book titles that you think are not appropriate for this project. Tell us why you think they are not appropriate:		
Performance Indicator	**Poor (1 point)**	**Satisfactory (2 points)**
Identifies appropriate source type.	Did not pick a book.	Picked a book.

Determines appropriateness of source for project.	Not relevant/appropriate.	Relevant/appropriate to project.
Articulates appropriateness of source.	Not a good explanation of why item is not appropriate.	A good explanation of why item is inappropriate.

Question 6: Where did you search for articles? What databases/search engines did you use? What did you type in to the databases/search engines for your search?			
Performance Indicator	**Poor (1 point)**	**Satisfactory (2 points)**	**Excellent (3 points)**
Identifies appropriate information source.	Identified resource not appropriate for finding articles (and is not from library), or did not identify any resource.	Identified library resource, but not one that is best for finding articles	Identified library resource appropriate for finding articles (subject database, power search).
Identifies appropriate search terms.	Used keywords that would not return useful or relevant results based on research question.	Used keywords that would return less useful but potentially relevant results based on research question.	Used keywords that would not return useful or relevant results based on research question.

Question 7: Print the first page of your search results and attach to this paper.
No points were awarded for this question.

Question 8: Circle the 2 article titles that you think are most appropriate for this project. Tell us why you think they are the most appropriate.		
Performance Indicator	**Poor (1 point)**	**Satisfactory (2 points)**

Identifies appropriate source type.	Did not pick an article.	Picked an article.
Determines appropriateness of source for project.	Article not relevant/appropriate for project.	Article relevant/appropriate for project.
Articulates appropriateness of source.	Not a good explanation of why item is appropriate.	Good, cogent explanation that reflects a sense of the topic; or identified some inherent weakness in the item (i.e. not an article, etc.).

Question 9: Do you think these articles are scholarly? Why or why not?

Performance Indicator	Poor (1 point)	Satisfactory (2 points)
Determines if source is scholarly or not.	Analysis is not correct.	Analysis is correct.
Articulates criteria for scholarly sources.	Did not give a good reason.	Gave a good reason.

Question 10: Write an X through two article titles that you think are not appropriate for this project. Tell us why you think they are not appropriate.

Performance Indicator	Poor (1 point)	Satisfactory (2 points)
Identifies appropriate source type.	Did not pick an article.	Picked an article.
Determines appropriateness of source for project.	Article not relevant/appropriate for project.	Article relevant/appropriate for project.
Articulates appropriateness of source.	Not a good explanation of why article is inappropriate.	Good, cogent explanation that reflects a sense of the topic; or identifies some inherent.

Question 11: Where did you search for websites? What search engine(s) did you use? What did you type in to search for?

Performance Indicator	Poor (1 point)	Satisfactory (2 points)	Excellent (3 points)

Identifies appropriate information source.	Identified resource not appropriate for finding websites.	Identified resource appropriate for finding websites.	n/a
Identifies appropriate search terms.	Used keywords that would not return useful or relevant results based on research question.	Used keywords that would return less useful but potentially relevant results based on research question.	Used keywords that would return useful results based on research question.

Question 12: Print the first page of your search results and attach to this paper.
No points were awarded for this question.

Question 13: Circle the 2 websites titles that you think are most appropriate for this project. Tell us why you think they are the most appropriate.		
Performance Indicator	**Poor (1 point)**	**Satisfactory (2 points)**
Determines appropriateness of source for project.	Website not relevant/appropriate for project.	Website relevant/appropriate for project.
Articulates appropriateness of source.	Not a good explanation of why website is appropriate.	Good, cogent explanation that reflects a sense of the topic; OR identifies some inherent weakness in the item.

Question 14: Write an X through two websites titles that you think are not appropriate for this project. Tell us why you think they are not appropriate.		
Performance Indicator	**Poor (1 point)**	**(2 points) Satisfactory**
Determines appropriateness of source for project.	Website relevant/appropriate for project.	Website not relevant/appropriate for project.

Determines appropriateness of source for project.	Not a good explanation of why website is not appropriate.	Good, cogent explanation that reflects a sense of the topic; or identified some inherent weakness in the item.

Question 15: *Imagine that you are including each of the following statements in your research paper. Circle the correct option for indicating whether you do or do not need a citation.*

Performance Indicator	Poor (0 point)	Satisfactory (1 points)
Determines if statements needs a citation	Chose "Does not need a citation."	Chose "Needs a citation."

Question 16: *Imagine that you are including each of the following statements in your research paper. Circle the correct option for indicating whether you do or do not need a citation.*

Performance Indicator	Poor (0 point)	Satisfactory (1 points)
Determines if statements needs a citation	Chose "Does not need a citation."	Chose "Needs a citation."

Question 17: *Imagine that you are including each of the following statements in your research paper. Circle the correct option for indicating whether you do or do not need a citation.*

Performance Indicator	Poor (0 point)	Satisfactory (1 points)
Determines if statements needs a citation	Chose "Does not need a citation."	Chose "Needs a citation."

Question 18: *Imagine that you are including each of the following statements in your research paper. Circle the correct option for indicating whether you do or do not need a citation.*

Performance Indicator	Poor (0 point)	Satisfactory (1 points)

Determines if statements needs a citation	Chose "Does not need a citation."	Chose "Needs a citation."

Appendix D – Prepared Focus Group Questions (Phase Three)

1.   Which parts of Searchpath **held your interest the most**?
        Which parts of ResearchPath **held your interest the most**?
        What did you like about these parts?

2.   Which parts of Searchpath **held your interest the least**?
        Which parts of ResearchPath **held your interest the least**?
        What did you not like about these parts?

3.   What parts of Searchpath had content that was **easy to understand**?
        What parts of ResearchPath had content that was **easy to understand**?
        What made it easy to understand?

4.   What parts of Searchpath had content that was **hard to understand**?
        What parts of ResearchPath had content that was **hard to understand**?
        What made it hard to understand?

5.   What did you think of **"the look"** of Searchpath?
        What did you think of **"the look"** of ResearchPath?
        How would you **describe** it?
        What did you like or not like?

6.   What did you **like the most** about Searchpath?
        What did you **like the most** about ResearchPath?

7.   What did you **like the least** about Searchpath?
        What did you **like the least** about ResearchPath?

8.   If it was up to you to **redesign** Searchpath, what would you **add or take away**?
        If it was up to you to **redesign** ResearchPath, what would you **add or take away**?