

TechCommix: A Tool and Foundation for Rethinking and Restructuring Technical Communications

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Comics is a writing style that is often written off as just something done for entertainment or design. However, there are many facets of comics that make it a suitable candidate for technical documentation. By nature, comics is a visual and universal language and, as such, is the basis for an investigation of comics within the scope of technical communication. This research investigates whether comics can be automatically generated, based on a set of predefined panel templates, for such purposes while also providing for flexibility in both content and ultimate consumption format. A within-subjects study run with over 200 participants compared comics to two of its traditional documentation style contenders, prose and step-oriented, in terms of understanding and evaluation metrics, including those related to user experience. Results indicate that comics as a documentation style can offer enhanced, more positive user experiences, albeit not being overall better than the other styles.

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All ©TechCommix comics were created by me for the purpose of this thesis.

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Chapter 1: Introduction

When was the last time you read an instruction manual or how-to instructions? When was the last time you readily sought out the content rather than tried to figure things out first? When you did, was the content seemingly as cryptic as the problem itself that you were trying to solve? Did the format help you answer your questions or was it just part of the problem? These and other questions dealing with documentation formats for technical communication indicate an existing problem and the potential for new ways, or rather the rekindling of old ways, of communicating technical content.

Often forgotten or cast off as an impractical style of communication not to be taken seriously outside its use for entertainment, comics provide a universally understood combination of visual and textual forms of documentation represented in a narrative structure [1]. Comics are visual by nature, representative of a universally understood, conversational based discourse that vastly contrasts the traditional formal, often pure textual based discourse of technical documentation. Can technical information be presented in a non-traditional, comic format and can users utilize this format for purposes of technical communication? Furthermore, there is no artistic requirement for the creation of comics, but there are conventions and a need for technical communications to be in electronic format and easily accessible for distribution, consumption, and storing and maintaining. In short, can we rethink how we structure technical documentation?

Prior work in the field of technical communications and, specifically, work being conducted by the interdisciplinary and experientially diverse TechCommix project has started the groundwork for an investigatory and data-to-action driven approach, which focuses on both theoretical and applied knowledge, towards developing new methodologies for how people create, share, and comprehend technical communication.

Research Questions

The following research questions guided the research documented in this thesis.

RQ1. Can we automatically generate comics on multiple platforms and in a responsive way to provide flexibility in content and consumption format?

RQ1 involves multiple facets of authoring, on the content side as well as the structural side. Through the inclusion of flexibility, I am avoiding any presumptions as to what a particular author will need. By such, we open ourselves to researching whether a tool can have enough flexibility to provide for specific content and formatting needs. Examples of the intended flexible behavior of a tool for creating comics include allowing for swapping of different comic characters, allowing for user-defined panel images, and having the capability to display user-inputted textual content inside comic panels that can adapt to different screen sizes and platforms. A tool that would automatically generate comics, but with too many restrictions to the user would be counterproductive to the comic book form, in which creativity and flexibility in content of both image and textual format are the pinnacle of its foundation.

RQ2. Given comics that have been created by the above described process, how do such generated comics compare to other documentation styles?

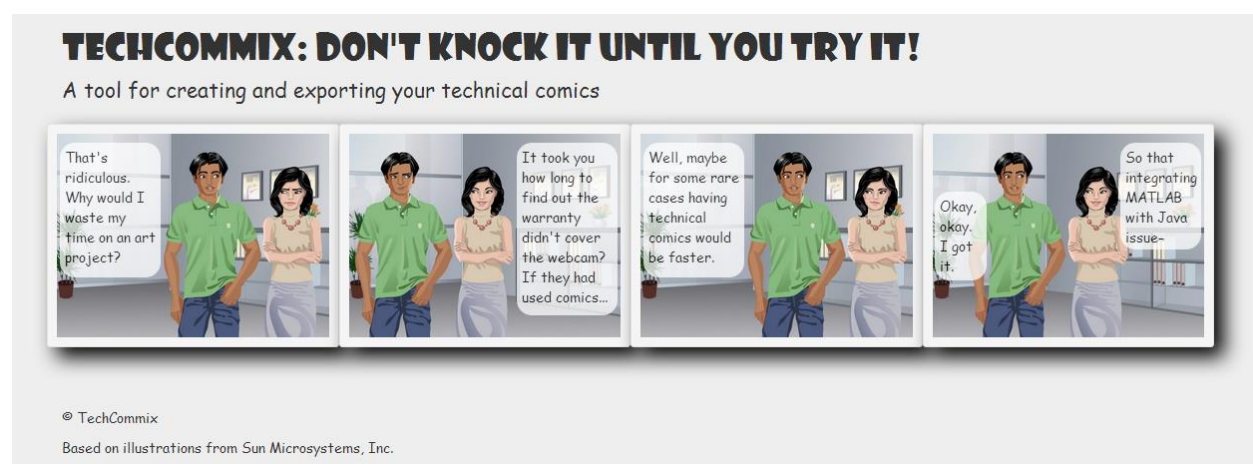
RQ2 deals with the validation of the actual output of automatic comic creation. For this question, I explore how automatically created comics compare to other existing documentation styles. This includes investigating multiple styles of technical documentation and on several critical levels, including understanding and user evaluation of the given styles. While the ultimate goal is to convey information, this does not mean forgetting *how* that information is displayed and the *impact* this presentation has on the reader.

TechCommix Project

Comics can be utilized as technical documentation through their traditional and universally-understood language [1]. The goal of the TechCommix project is to study the merits and applications of comics in technical domains through the creation of a tool for the authorship of technical comics, the creation of actual technical comics, the future integration of technical comics into existing online technical documentation, and the evaluation of the use of those technical comics and the aforementioned tool. An example of a comic strip developed using the TechCommix tool is shown in Figure 1.1.

This document describes my work as part of the TechCommix project. Chapter 2 provides a literature review, detailing literature that has informed this research in terms of background knowledge of comics as documentation as well as other reference material that fit within the scope of this work. Chapter 3, TechCommix - Comics Authorship Tool, relates what went into the creation of the comic authorship tool. Chapter 4 describes methodology and study design. Chapter 5 relates the results and findings of the previously mentioned study. Chapters 6, 7, and 8 describe the conclusions, impact, and summary of this work.

Figure 1.1: Early-authored Comic on TechCommix



Chapter 2: Literature Review

Comics are neither new nor fundamentally unacknowledged as a genre of writing. As a discourse for technical communications, however, comics have many unexplored facets and areas of application. Situating comics in the realm of technical communications has occurred historically. One example of this is the PS Magazine the Preventative Maintenance Monthly that has been an official publication of the U.S. Department of the Army since 1951, as an informational publication for soldiers in combat, combat support, or supply and maintenance roles [2]. A more recent example is the Google Chrome comic book that explains the workings and rationale behind the Google Chrome browser [3]. The study of such comics as technical communication is being revived through research that speaks not only to the applicability of comics as documentation, but also to how comics can be created and used within existing technical areas to fulfill societal gaps of information distribution.

Previous, published work outlines the use of comics in technical contexts, including news comics as genuine journalistic content and teaching resources that emphasize key ideas and concepts for enhanced comprehension [4]–[9]. I. Cervesato uses a comic book as the main course material for an introduction to logic course for incoming computer science majors [7]. Also in the context of education, M. J. Green introduced a medical education course on comics and medicine, the course material for which includes both the consumption and authorship of graphic narratives, two aspects that this research will touch on [4]. Furthering the research on comics on serious subject matters, B. Chen, R. Jablonsky, J. B. Margines, R. Gupta, and S. Thakkar present research on news comics, again dealing with both the consumption and authorship of comics, while G. Davison, S. Murphy, and R. Wong present their work on a comic book as technical documentation for IBM’s DB2 Universal Database, geared towards an audience of database administrators [6], [8]. The work of M. Haesen, J. Meskens, K. Luyten, and K. Coninx as well as P.-Y. Chi, S. Ahn, A. Ren, M. Dontcheva, W. Li, and B. Hartmann speaks to the strengths of utilizing visuals and texts for documentation [5], [9]. These works represent aspects of documentation that are relevant to this research including visuals, timing and flow, and the type and complexity of the content being conveyed. Specifically resonant, these works show the use of visuals alongside text, often in a narrative form, to convey technical content.

Comics as resources for technical documentation, which leads to implications concerning content and documentation type. D. Rowland, B. Walker, A. Chamberlain, S. Rennick Egglestone, J. Marshall, H. Schnädelbach, S. Benford, D. Porter, M. Gibson, K. Walker, J. Underwood, R. Luckin, H. Smith, G. Fitzpatrick, and J. Good show that comics offer “unique mechanisms of communication,” such as reader engagement and the presentation of information, including that of higher level discourses, for relatively quick consumption [10]. E. Haughney points out that fundamentally, comics are narratives written using a “visual design language” [11]. As such, they have the ability to create a new dimension of technical communication, one that is already a common language to its readership [1]. S. McCloud more specifically defines comics as “juxtaposed pictorial and other images in deliberate sequence, intended to convey information and/or to produce an aesthetic response in the viewer” [1]. S. McCloud along with Kevin Cheng recognize that like other documentation styles, formatting matters and given this, the potential for comics to play a more central role in the area of technology and technical communication is growing [12]–[14].

In utilizing comics for teaching, M. J. Green notes that comics transport readers into a story, effectively holding a target audience [4]. Inversely, from the production side, the author of the comic can key in to social as well as technical aspects of information conveyance [4]. This research considers this and studies how comics can go beyond the technical content, merging aspects of both technical documentation and user experience. C. Evia, M. Stewart, T. Lockridge, S. Scerbo, and M. Perez-Quñones explore the authoring process of technical comics, research that leads to considerations of the levels of automation that can apply to this process [15]. Given an expanding focus on the authorship of comics, including the development of tools and techniques to facilitate the technical authoring process, structured authoring and reuse are documentation aspects that are brought to the forefront [15]–[17].

C. Evia et al. further discuss the need for a balance between traditional comic language, such as humor, and technical writing discourse, a concept which goes back to the overarching question of how much information to relay and in what manner, a question also explored by G. Davison et al. [8], [15]. As highlighted by S. Murphy, C. Evia et al., and G. Davison et al., among concerns of language and authorship, organizational consistency and flexible deliverables, such as options for viewing content through comic or transcription formats and formats which reduce visual noise or add audio or voice-over script for visually and cognitively impaired users, can aid in the accessibility, reuse, and archiving of content [8], [15], [18]. Although still concerned with measurable evaluations of the quality of technical documentation, G. Hargis and A. M. Aladwani and P. C. Palvia convey concerns with technical documentation as it relates to audience, user experience, and the level of technicality reflected within the text of the documentation [19], [20].

Chapter 3: TechCommix - Comics Authorship Approach

I created a method for the generation of comics to be viewed online across multiple platforms and devices. The comic generation was handled by using a combination of XML, HTML, and PHP. An existing PHP program utilizes an XML data file containing the content of the comics and an HTML template file to produce technical comics in HTML format [15], [21]. The ultimate goal is an online comic authoring and sharing that may be accessed and the resulting comics viewed and downloaded from any PC, tablet, or smartphone device.

My comic authoring and generation process can be categorized into the following steps: 1) I investigated the formatting and structuring of comics, by studying existing comic book guidelines, 2) next, I created scenarios for the use of comics as documentation, and 3) then, I started generating examples of comic documentation. I went through several iterations of generating panel elements and layouts, revisiting the comic book guidelines to drive the design. Figure 3.1 is an example of comic generation. As you can see, compared to Figure 1.1, this comic now has speech bubbles with callout points to indicate which character is speaking. One way in which this comic differs from later comics, those created for the study described in Chapter 4, is that the speech bubbles are more square, which had unanticipated effects on the reading and understanding of the comics. An initial fix of the bubble formatting can be seen in Figure 3.2, a comparison between the same comic made similarly to Figure 3.1 and then experimentally changed to the new, longer bubble formatting. Notice that the callouts are still not clear, as the bubbles for the character on the left look more like the start of the speech for the character on the right. When two characters are talking, it is more difficult to discern which speech bubble is spoken first, since the speech bubbles are near the same height and not implying enough of an order so that the reader can unconsciously read from speech bubble to speech bubble and from panel to panel in the comic. The example comics then led to the identification of panel types for use when generating the comics. The use of a specific panel led to an initial categorization of the differing panel types.

I further outlined and formalized the panels, and this authoring process eventually resulted in 14 panel types. I created these panel types as a framework in an effort to capture the raw process of translating pure, technical documentation into comic format. I initially identified preliminary factors in comic creation and considered, including the use of panel and layout structure, the use of text as speech, thoughts, and narration, the use of images, and the use of supplementary resources including links to other online content. After the initial identification, these factors were combined based on comic style guidelines as well as guidelines for actual use, including narration box, speech bubble, and thought bubble sizing based on the needed space for the generated example comics.

Figure 3.1: Early Comic Example

VIEW YOUR VT PLAN OF STUDY (POS)

A technical comic that shows users how to view their current Plan of Study and its status online

The comic illustrates the process of viewing a Plan of Study (POS) on the Virginia Tech Information System. The characters, a man and a woman, are shown at a computer, with the man providing instructions and the woman following along.

Panel 1: The man says, "That's a big cloud over your head." The woman has a thought bubble containing "I'm @ #*?!"

Panel 2: The man says, "I can't find out how to check if my Plan of Study was approved."

Panel 3: The man says, "I can show you right now if you'd like."

Panel 4: The man says, "Go to HokieSpa and login."

Panel 5: Screenshot of the Virginia Tech homepage. The man says, "Go to hokiespa.vt.edu."

Panel 6: Screenshot of the Virginia Tech Information System login page. The man says, "Then, here we are."

Panel 7: Screenshot of the Central Authentication Service login page. The man says, "Login using your pid and VT password. Wow, and I thought I had a strong password."

Panel 8: Screenshot of the Virginia Tech Information System main menu. The man says, "Go to the 'HokieSpa' tab at the top, under the website banner."

Panel 9: Screenshot of the Virginia Tech Information System main menu. The man says, "Click 'Degree Menu.'"

Panel 10: Screenshot of the Degree Menu. The man says, "Click the 'Graduate Student Degree Menu' link."

Panel 11: Screenshot of the Graduate Student Degree Menu. The man says, "Click on the 'Plan of Study' link, the second one in the list."

Panel 12: Screenshot of the Plan of Study page. The man says, "And there you go, the POS status box and the approved content."

Panel 13: The man says, "Excellent. Everything was approved."

Panel 14: The man says, "Yeah, they tend to have a good handle on things around here."

Figure 3.2: Comic Comparison

CHANGE YOUR DEGREE STATUS

A technical comic that shows users how to change their degree status



© TechCommix

CHANGE YOUR DEGREE STATUS

A technical comic that shows users how to change their degree status



© TechCommix

Scenarios

The following scenarios were used to inform the creation of the comics authorship process.

Henry is a junior in college. Time is the hardest thing for him to find. He divides it between his computer science coursework and two jobs, one for the university tech support and the other for a landscaping company. He is a strong academic student, the go-to guy for troubleshooting tech issues in his classes, and his studies take the foreground over sleep, hanging out with friends, and asking Emma, his lab mate, to go on a date with him. You wouldn't be able to tell based on his grades and intellectual capabilities, but Henry was a slow learner when he was little and learning to read. In fact, he still takes perhaps two to three times longer than the more reading adept student to fully read and comprehend textbooks and technical documentation, which is why he prefers labs and practical examples to lectures.

Paco works for a construction company, saving up money so that he can be able to send his two kids to college. He already had to tell his youngest, his baby girl, that she could not attend dance classes with her friends. His son found her some classes at the local youth center, but none of her friends want to go there with her. So, she continues to just tag along with her mother to watch her older brother's parks and recreational soccer matches. Her mother lets her give the play-by-play to her father at dinner. A management position is opening up that Paco wants to apply for, but he has to pass a series of safety and management tests before he can be applicable. Since English is his second language, the study materials are hard for him to follow and he gets discouraged anytime he opens up the readings.

Greta is a single mom raising three boys. One is already in college, and the other two are in high school. Her oldest jokes that the ROTC program is a breeze after living under her roof for so long. She is a mom 24/7, but for 40 hours out of the week she is also a web designer for an up and coming web development company and has just been assigned the role of acting project manager for two design teams, each consisting of four members other than herself. If having three boys has taught her anything, it is how to manage people, but managing ideas and requirements comes less natural to her.

Henry, Paco, and Greta are just three of many hardworking people with jobs and dreams. It is people like them that I aim to support through the TechCommix project. TechCommix is an interdisciplinary project, currently consisting of English, technical communications, and computer science faculty and students. The goal is to provide a tool and foundation for the use of technical comics as resources for people in any academic field or career position. The conversational, structural, and pictorial aspects of comics lend themselves to use as resources to convey concepts and information through a common and conversational language. While not all information can be narrowed down to comic book format, technical comics can serve to not supplant, but to support existing technical documentation.

How can TechCommix help? For Henry, TechCommix would mean precursory, easier to understand concepts and educational resources in the form of technical comics as classroom materials to supplement lectures and textbooks. That way, when Henry is ready for the nitty-gritty details, he will already have a knowledge base for what he is about to learn. This means more sleep, some social time, and less time stuck pining over a textbook. For Paco, this would mean safety and technical manual material being presented through technical comics, which will enable him to study for and pass the tests that qualify him for a management position at his

company. He will be more knowledgeable of company safety policies and procedures and more readily able to show his own strengths of character in the workplace. For Greta, TechCommix would provide a means for both the creation and dissemination of ideas and workflow concepts among her project groups. With increased communication and idea and requirements sharing, Greta may be as successful at supporting her project groups as she is at supporting her family.

The TechCommix Process

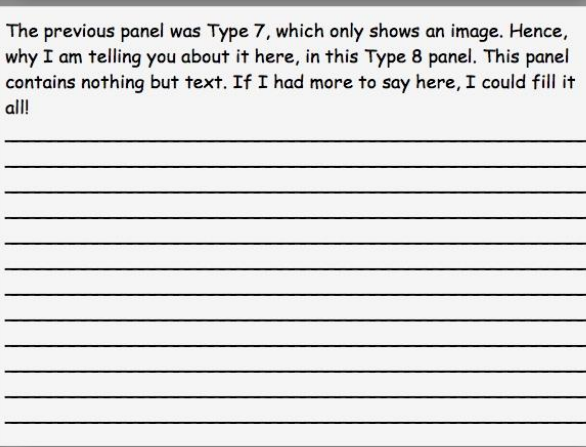
For the XML data files, I used TechCommix, an XML-based notation originally developed by C. Evia et al. [15]. TechCommix is a combination of ComicsML, a markup language for online comics, with the Darwin Information Typing Architecture (DITA), an international standard for technical documentation, as described in “Structured authoring meets technical comics in Techcommix,” [15], [22]. Elements which are not used include the traditional text elements that contain speech, thought, or narration tags. Instead, the speech tags have been replaced by the general text element tags and newly developed type tags, which abstract away the tagging of specific text as narration, speech, or thoughts. Unlike using specific tags for the textual content, the type elements each represent a panel type, all of which are outlined below in Figure 3.3. Each of these 14 panel types encompasses one to many comic-formatting elements.

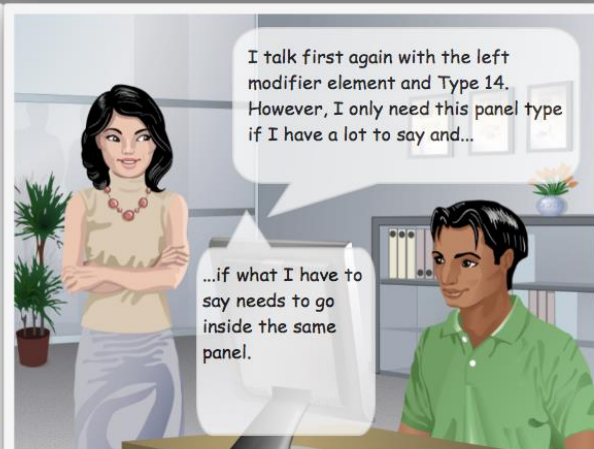
Figure 3.3: Comic Showing the 14 Panel Types

The 14 Panel Types

Displayed and Explained







Comics created early on with the tool along with comic creation literature influenced the eventual comic panel types. This included how those panel types would be displayed and how each specific element within the panel type would be displayed to ensure readability and validation of form through the use of comic creation conventions [1], [13]. The main panel images used are from open source comic panels and characters developed specifically for the creation and distribution of storyboards for distributed teams [23]. For the purposes of this tool, the images are serving as comic panels and characters for technical communications comics in general, rather than storyboarding. All of the remaining panel images that are not from this source are screenshots used for exemplifying visual instructions and reference points in terms of technical and how-to instructional content.

I used a template system to translate the raw XML data file in combination with the HTML panel template file, which outlines all of the panel types, into a digitally displayed comic [21]. See Appendix A for the full HTML template file that defines the 14 panel types and the full XML data file that was used to generate Figure 3.3. For more examples of comics generated using this approach see Appendix B.

Given the level of authored input is minimal, there is the possibility for automatically generating the resulting digital comics. In creating each comic, the user only inputs data into the XML file. The process currently involves the user defining a new panel, adding and classifying the panel text, adding the file location of the panel image, and choosing one of the 14 panel types and any of its right or left modifiers. The templating system then does all of the translation work with the XML data and pre-existing HTML panel template file. Essentially, all of the user input could be received through labeled text forms or any data input selection interface, specifying the needed author input. Panel types and images could be selected from a database of options. Users could choose to select one of the predefined panel images or upload their own screenshots or images. After that, the XML file could be automatically generated from the collected user data. The remaining steps now coincide with how the tool functions to generate the digital comic.

Figure 3.4 shows a section of the notation taken from the XML data file. The first tag, the open panel tag, specifies that a comic panel is being created. The action tag gives a description of what is going on in the panel, such as what the reader will see happening in the environment or among the characters. The text tag specifies the content that will be placed inside the speech bubble or thought bubble of that panel type. Panel Type 3 only has one speech bubble, so there is only one text tag, text1. However, if the panel type has multiple speech or thought bubbles, there will be numerous text tags, numbered text1, text2, and so forth from left to right, as one reads. The image tag is for the file path to the image that will serve as the panel background image. The left or right tag is present when a panel type needs to indicate whether the single speech bubble or thought bubble is associated with the speech or thoughts of character on the left or right of the panel. In Figure 3.4 there is a left tag, indicating that the character on the left is the one doing the talking in this particular comic panel. The type tag represents which of the 14 panel types this content will be formatted into. In this example, the type tag is type3, indicating that this content is to be formatted into panel Type3 that has one character speech bubble. Finally, the newrow tag is used to manually specify that this panel is the last in this row of panels for this comic strip in the cases where this is rendered in a large monitor.

Due to an incompatibility issue in the template system, the left, type, and newrow XML tags needed to be written as they are seen in Figure 3.4 with the open and closing tag along with

any text inside those tags. However, once this issue has been fixed in the template system, the tags can be written in the form: <tag/>.

Figure 3.5 shows a snippet of HTML on the definition of panel Type 3 taken from the template.html file. It shows that this panel type, Type3, includes a background panel image and one speech bubble that will be for the character on the right or the left, depending on what is specified in the XML data file, either the left or right tag. The text enclosed in the curly braces in Figure 3.5 corresponds to the tags in the XML data file, like those seen in Figure 3.4. The template system uses the code in Figure 3.4 in combination with the html template code of Figure 3.5, for a Type 3 panel, to generate a comic panel that looks like the fourth panel of Figure 3.3.

Figure 3.4: XML notation of a sample panel content from data_types.xml file

```
77 <panel>
78   <action>We see a close up of AnaLi.</action>
79   <text1 characterid="1" type="plot">Type 3 with the left
80     modifier element contains one speech bubble to show that
81     the character on the left is talking. That's me!</text1>
82   <image>panels/pp125.png</image>
83   <left>left</left>
84   <type3>type</type3>
85   <newrow>row</newrow>
86 </panel>
```

Figure 3.5: Code on Type3 panel definition from template.html

```
328 <% else %> <!-- Type 3 -->
329 <% if {type3} %>
330 <% include image.html %>
331 <%if {left} %>
332 <div class="bubbleLeft">
333   <p class="font">{text1}</p>
334 </div>
335 <% else %>
336 <%if {right} %>
337 <div class="bubbleRight">
338   <p class="font">{text1}</p>
339 </div>
340 <% end %><!-- end right -->
341 <% end %><!-- end left -->
```

The TechCommix process uses Bootstrap to create a responsive interface on which the resulting HTML comics can be viewed [24]. Utilizing Bootstrap's responsive grid system specifications, the comics automatically adapt to the screen size on which the user is viewing the comic by using that size to determine the number of panels per row to be displayed. For instance on mobile devices, the user would see one panel per row. On a laptop, when the window size is fully expanded the user may see four panels per row, depending on the comic specification, that would reduce to two panels, and then down to one panel per row as the user reduces the size of the viewing window.

Such a process, of automatically generating digital comics, has the potential to be even more robust. A database of panel images could easily be evolved into a database of not only panel images, but of comic characters as well. Images within such a database can be classified through tags. Through the tagging of each panel and character, the user could filter their search to find panel images or characters that meet the needs of a particular comic or individual panel. These tags would be incorporated as notation within the XML comic data specification files, allowing for the automatic selection of images and characters. This would further enable the author to reuse and customize content for comics based on the intended audience or requirements. Swapping from a male to female lead character could happen on the user side, when creating the initial comic, or on the automated side. One comic could be distributed to various readers, where the comic characters vary depending on the individual receiving the comic. If I create a comic and send it to a club that promotes women in computer science, I could ensure that the characters in the comics are all women, or women interacting with men. If I create a comic to outline diversity within computer science, I could ensure that the characters in the comic are of diverse backgrounds.

Chapter 4: Methodology

The following research was approved by the Institutional Review Board for projects involving human subjects at Virginia Polytechnic Institute and State University and the Department of Computer Science. It is Virginia Tech Institutional Review Board Project No. 14-102, approved February 19, 2014. Two amendment requests were approved on April 3, 2014 and April 10, 2014, respectively. The IRB documentation can be found in Appendix C. For the study, I collected data digitally through an online data collection and survey system, Qualtrics Research Suite [25]. All data was confidential. Only unique subject identifiers, not personally identifiable information, was used in analysis and reports. The overarching goal of the study was to address the aforementioned research question on how generated technical comics compare to other documentation styles.

Study Overview

In order to investigate RQ2, I conducted a study that utilized comics generated by the process described in the above TechCommix Comics Authorship Approach section and developed in investigation of RQ1. Participants were first asked to complete a consent form and pre-questionnaire asking basic demographic and background information. They were then presented with three short how-to documents for questions and document evaluation. After, they were asked to complete a post-questionnaire on their experience. All of these documents can be found in Appendix D.

Participants

The subject pool for this study was participants 18 years of age and older. The study was announced through the Virginia Polytechnic Institute and State University (VT) listservs, other university and course email announcements, VT Department Psychology SONA research participation system, and general student email circulation and discussion generated by the announcement of the study. A study announcement was sent out to three computer science courses offering extra credit for participation. Those courses were CS1044 Introduction to Programming in C, CS1054 Introduction to Programming in Java, and CS2104 Introduction to Problem Solving in Computer Science. Each student who volunteered through the SONA system or one of the above mentioned courses received credit for their participation.

By signing an informed consent document prior to starting the study, each participant acknowledged that he or she is 18 years of age or older at the time of the study session and voluntarily agreed to participate in the study. The informed consent document stated that if participants were unable to complete the study for any reason, they could have withdrawn at any time and still receive credit if they were signed up to do so.

A total of 216 participants took the study. However, the survey data collected for 10 of these participants was incomplete, and thus, not included in analysis. This left a total of data

from a total of 206 participants, 82 female and 124 male, for the analysis. The age range was 18 to 24, with an average of 20. Two of the participants were graduate students, first year Masters students, and the rest were undergraduates. The majors and number of participants per major can be seen in Table 4.1. Out of all of the participants, 2 regularly write how-to documentation, 12 regularly evaluate how-to documentation, and 89 regularly use how-to documentation. Of those 89 regular users of how-to documentation, 4 use it daily, 2 use it 5-6 times a week, 12 use it 3-4 times a week, 38 use it 1-2 times a week, and 33 use it 1-3 times a month.

Table 4.1: Number of Participants by Major

Major	Number of Participants	Number of Participants as Second Major
Accounting	2	
Aerospace Engineering	8	1
Applied Economic Management	1	
Biochemistry	3	
Biological Sciences	10	1
Biological Systems Engineering	1	
Business Information Technology	22	2
Business Undecided	2	
Chemistry	3	
Civil Engineering	18	
Communication	3	1
Computer Science	13	
Economics	1	1
Engineering Science and Mechanics	16	
Finance	1	
Food Science and Technology	1	
General Biosciences	1	
General Engineering	29	
Geography		1
Geophysics	1	
German		1
Hospitality and Tourism Management		1
Human Development	2	
Human Nutrition, Foods and Exercise	3	
Industrial and Systems Engineering	15	

International Studies		1
Management		1
Marketing Management	1	
Mathematics	8	2
Mechanical Engineering	17	
Ocean Engineering	5	2
Physics	3	
Political Science	1	
Psychology	9	4
Statistics		1
Theatre Arts and Cinema		1
University Studies	5	
Unknown	1	

Study Design

The study was a within subjects design, where each participant was given each of the three tasks. Each participant did not see all combinations of task and documentation styles. To account for this, each participant was given three pairs out of the task and documentation style combinations. All pairs were counterbalanced across all of the participants so that all participants saw three pairs in terms of task and documentation style. A Latin square was used to determine the order in which each documentation style was seen, as shown in Figure 4.1. Participant IDs consisting of 3-digits were randomly generated and distributed among the participants. Participants with IDs starting with a 1 received the style order associated with column one of the Latin square. Participants with IDs starting with a 2 received the style order associated with column two of the Latin square. Participants with IDs starting with a 3 received the style order associated with column three of the Latin square. The participants were told to bring their laptops so that they could both read from the documentation pages and answer the surveys on the subsequent pages.

Figure 4.1: Latin Square for Counterbalancing Documentation Styles

A	B	C
C	A	B
B	C	A

Key: A = Prose
B = Step-oriented
C = Comic

An informal run-through of the study was conducted early in the design process to gather information on the study length and any insights into the study materials and procedure. After initial changes to the study, removing extraneous questions or those that made the study equal to or longer than one hour, were made, three pilot study sessions were run. Each of the three pilot

participants completed the study in its entirety, one for each of the three tasks, where a single task was matched with one of the three documentation styles. The study materials were then finalized. The study consisted of a consent form and pre-questionnaire, Task 1 documentation reading and questionnaire, Task 2 documentation reading and questionnaire, Task 3 documentation reading and questionnaire, and a post-questionnaire. The details of the three tasks and three styles will be described later in this chapter. The full study surveys and questionnaires can be found in Appendix D. Each study session was conducted using the following procedure.

1. Participant signs the attendance sheet if they are signed up for credit through the SONA system or signed up for extra credit for a course
2. Participant is given a reference sheet that lists their participant ID, the study link, and a listing of their documentation readings, the order in which each is seen and the style of that documentation, prose, step-oriented, or comic
3. Participant opens their preferred browser and navigates to the study link that includes all of the instructions, documentation readings, and surveys, on their own laptops (ensuring familiarity with the input device used)
4. Participants are asked to complete the pre-questionnaire that contains both the consent form as well as demographic and initial background information questions (see Appendix D to view the full pre-questionnaire survey)
 - a. If the participant is under 18 years of age or does not wish to complete the study, and so chooses to decline participation for any reason, the survey skips to the end (none of the participants declined to complete this study)
 - b. If affirming that he or she is 18 years of age or older and will abide by the rules and conditions of the study, the participant then completes the demographic and background information questions
5. Participant then returns to the main study site to move on to the Task 1 documentation reading on “How To Request a Book”
6. When he or she has finished the reading for Task 1, the participant opens and completes the Task 1 questionnaire, for which he or she may reference the Task 1 documentation reading
7. Participant again returns to the main study site to move on to the Task 2 documentation reading on “How to Search Summon”
8. When he or she has finished the reading for Task 2, the participant opens and completes the Task 2 questionnaire, for which he or she may reference the Task 2 documentation reading
9. Participant once again returns to the main study site to move on to the Task 3 documentation reading on “How to Use Off Campus Sign In”
10. When he or she has finished the reading for Task 3, the participant opens and completes the Task 3 questionnaire, for which he or she may reference the Task 3 documentation reading
11. Participant returns to the study site, where he or she is prompted to open up a final survey
12. Participant completes the post-questionnaire survey on his or her overall experience with the documentation styles
13. Participant returns to the main study site for the last time and clicks that he or she has finished with the study, has completed all 5 of the surveys

How-To Documentation for the Three Tasks

The three tasks for the study were selected from the Virginia Tech University Library web pages [26]. Each participant saw the same tasks in the same order. I used procedural, how-to tasks rather than pure conceptual content. The three tasks are below along with the acronyms by which I will refer to these tasks for the remainder of this document.

Task 1 RB: How to Request a Book

Task 2 SS: How to Search Summon

Task 3 OCS: How to Use Off Campus Sign In

Task 1 RB documentation was based on the library webpage on “How to request a book,” from the Virginia Tech libraries [27]. This site had more complexity than was wanted for the study. For this task, therefore, the Task 1 RB questions were limited to the sections of this documentation that deal with requesting an available book, requesting a checked out book, and retrieving material from remote storage. Ultimately, limiting the breadth of the documentation to those details specifically within scope of requesting a book that is owned by the Virginia Tech libraries.

Task 2 SS documentation was based on the library webpage on “Summon help,” [28]. This site details how to search within the Virginia Tech libraries Summon database that includes all of the records from Addison, the Virginia Tech library catalog, as well as other books, articles, conference proceedings, theses and dissertations, manuscripts, maps, videos, music and other resources that Virginia Tech subscribes to or has access to through other publishers, government agencies, or database providers [29]. The task for the study was limited to types of searches and utilizing search field types and operators within search expressions to match search criteria.

Task 3 OCS documentation was based on the library webpage on “About Off Campus Sign In,” [30]. This documentation describes both the purpose and procedure for using the Off Campus Sign In authentication system in order for currently employed or retired faculty and staff or enrolled students at Virginia Tech to gain access to restricted library material when they are not connected to the Virginia Tech campus or one of the extended campuses networks. While signed in to the Off Campus Sign In, validated as being affiliated with Virginia Tech, the user has access to the otherwise restricted library resources, such as databases, ebooks, and ejournals [30].

Creating the How-To Documentation Styles

Prose

The prose style encompasses the original format of the how-to documentation as seen on the Virginia Tech libraries webpages for the three associated tasks as described in the section above, How to Documentation for the three tasks [27], [28], [30]. In order to be representative of a true prose documentation style, only the text inside the main body of this webpage, in essence all of the text associated with the task, was used in the study. All of the surrounding webpage banners, menus, and images were omitted.

Step-oriented

The step-oriented style documentation was created using the Darwin Information Typing Architecture (DITA) standard by the Organization for the Advancement of Structured Information Standards (OASIS) [31]. As an XML-based architecture for authoring technical documentation, DITA modularizes content into an information typing architecture that includes concepts, tasks, and reference content [16], [17]. This style is representative of a minimalist, structurally step-wise documentation format.

Comics

The comics were created from the comic authorship tool discussed in Chapter 3 of this thesis. Note that the comics were developed iteratively. One reason for this was to achieve conversational dialogue mixed with enough humor to add a more comic (as in the style) feel, rather than technical text pasted into comic format. Another reason was that the textual content need to both be informational as well as flow well with the visuals and fit into the panel without overwhelming the speech bubbles. The comics were authored to adhere to comic guidelines [1], [13].

Creating the Questionnaires and Surveys

The questionnaires and surveys for the study were based on three categorizations.

1. Background and Demographics
2. Understanding
3. Evaluation

The background and demographic information questions gathered participant characteristic data for use in data analysis, as was discussed in the Participants section of this chapter. I developed the understanding questions to test how well participants understood how they could use the given how-to documentation reading for a particular task and style. For the study, I used two types of understanding questions. The first set was true or false questions relating to performance understanding, where, as expected, the participant determined whether a statement was true or false based on the documentation reading. The second set was short answer questions where the participants had to come up with the answers based on the readings. For Task 1 RB and for Task 3 OCS, the short answers were formulated based in the participant's comprehension of the procedural information as described in the readings. For Task 2 SS, part of the short answer questions were likewise based on the participant's comprehension of the procedural information. However, a large section of the short answer questions required the participants to understand as well as apply the information from the readings by formulating search expressions. I developed a scale in order to grade the short answer questions. This scale is outlined below. Note that a correct answer may include some incorrect technicalities. This is only the case when the correct answer involves an end goal and the technical aspects of how that end goal is achieved is not what the question is asking.

- 0: Incorrect
- 1: Partially correct, shows some general understanding of solution
- 2: Correct or correct except for technical details

The evaluation section was developed with guidance on evaluating technical documentation from the book, "Developing Quality Technical Information, A Handbook for Writers and Editors," [32]. The evaluation section was split into two Likert scale rating sections. The first asked that for each given element below (left column) rate your satisfaction or dissatisfaction with respect to the how-to documentation for the given task. The elements included:

- Organization
- Language
- Format
- Flow
- Visual aesthetics
- Visual effectiveness
- Examples

The second asked that for each given statement below (left column) rate your agreement or disagreement with respect to the how-to documentation for the given task. The statements included:

- The language was clear.
- The examples were clear.
- The purpose of the documentation was clear.
- The examples were helpful.
- The level of detail was appropriate for the purpose of the documentation.
- The format of the documentation was interesting.
- The format of the documentation was helpful.
- The documentation answered user questions.
- The documentation left the user with unanswered questions.
- I enjoyed reading this how to documentation.

Study Task Interfaces

Figures 4.2 through 4.10 below highlight the appearance of the three task interfaces, across all three styles of documentation, comic, prose, and step-oriented, showing partial renditions of how the interfaces looked. To see all of the study interfaces, refer to Appendix D.

Figure 4.2: Task 1 RB – Prose Style

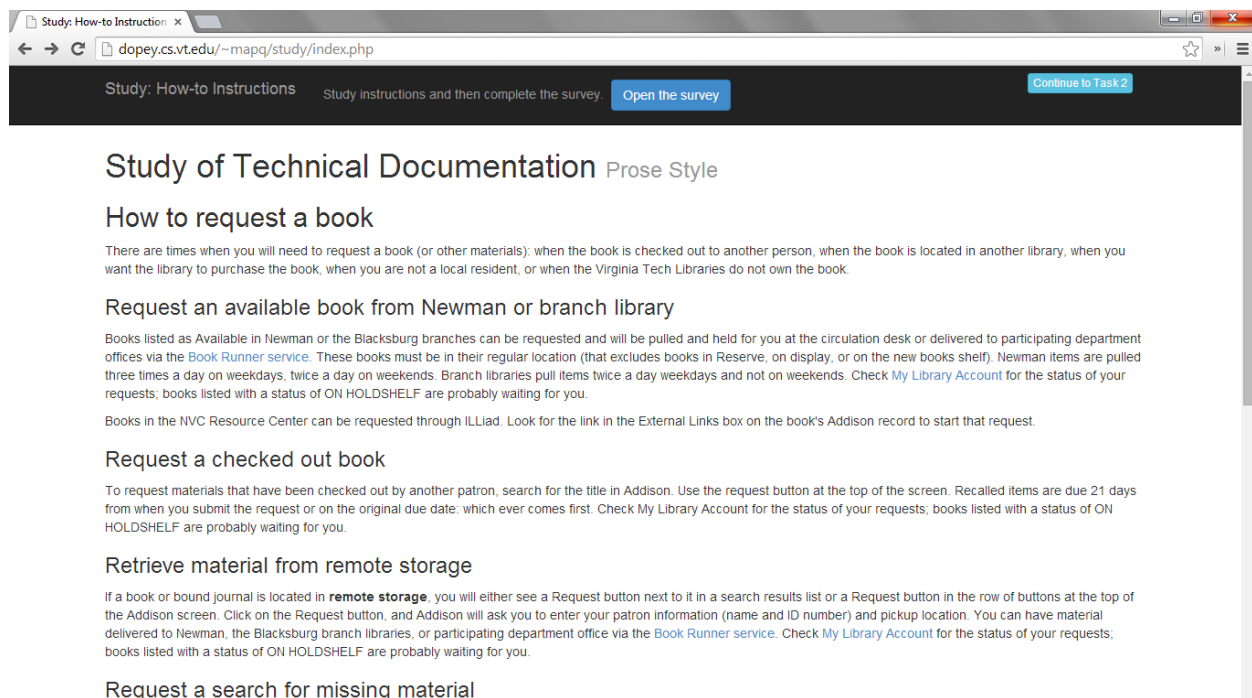


Figure 4.3: Task 2 SS – Step-oriented Style

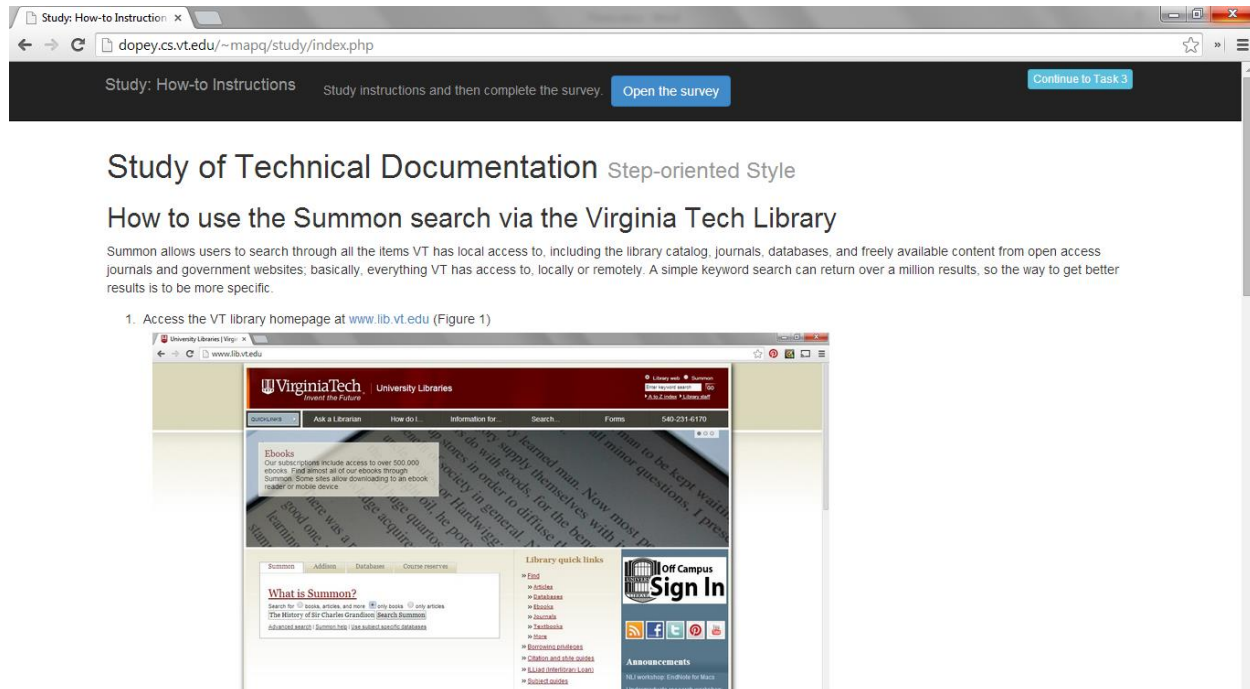


Figure 4.4: Task 3 OCS – Comic Style

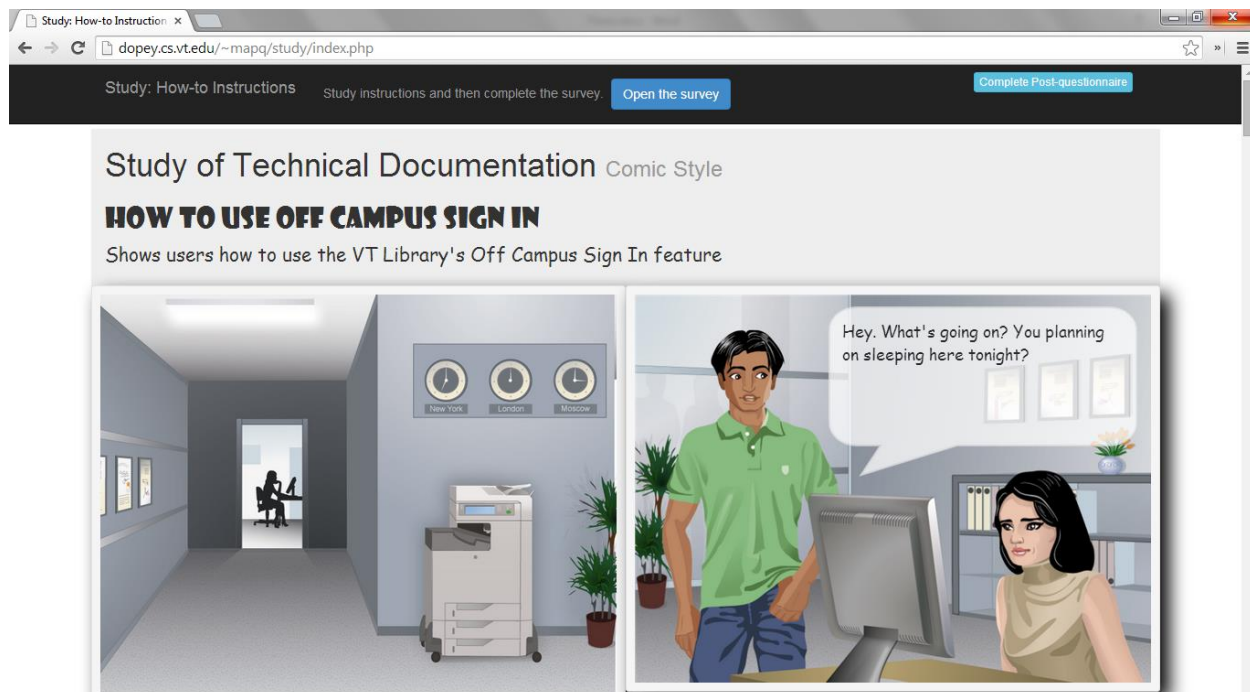


Figure 4.5: Task 1 RB – Comic Style

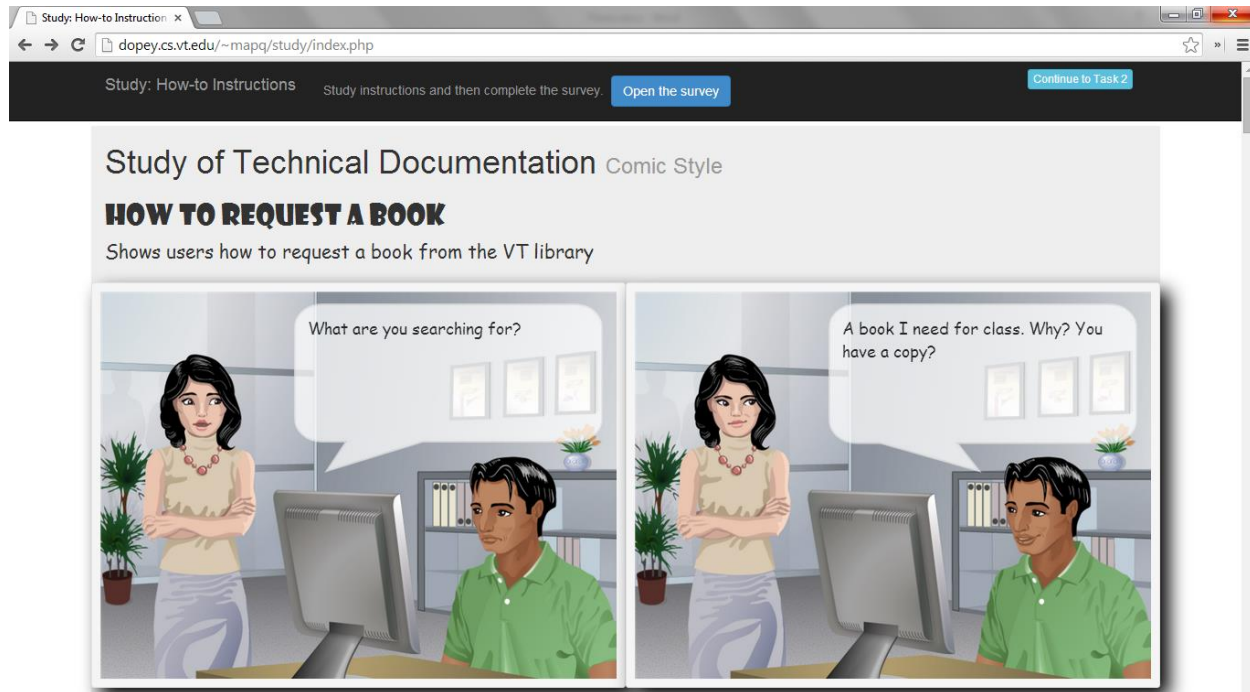


Figure 4.6: Task 2 SS – Prose Style

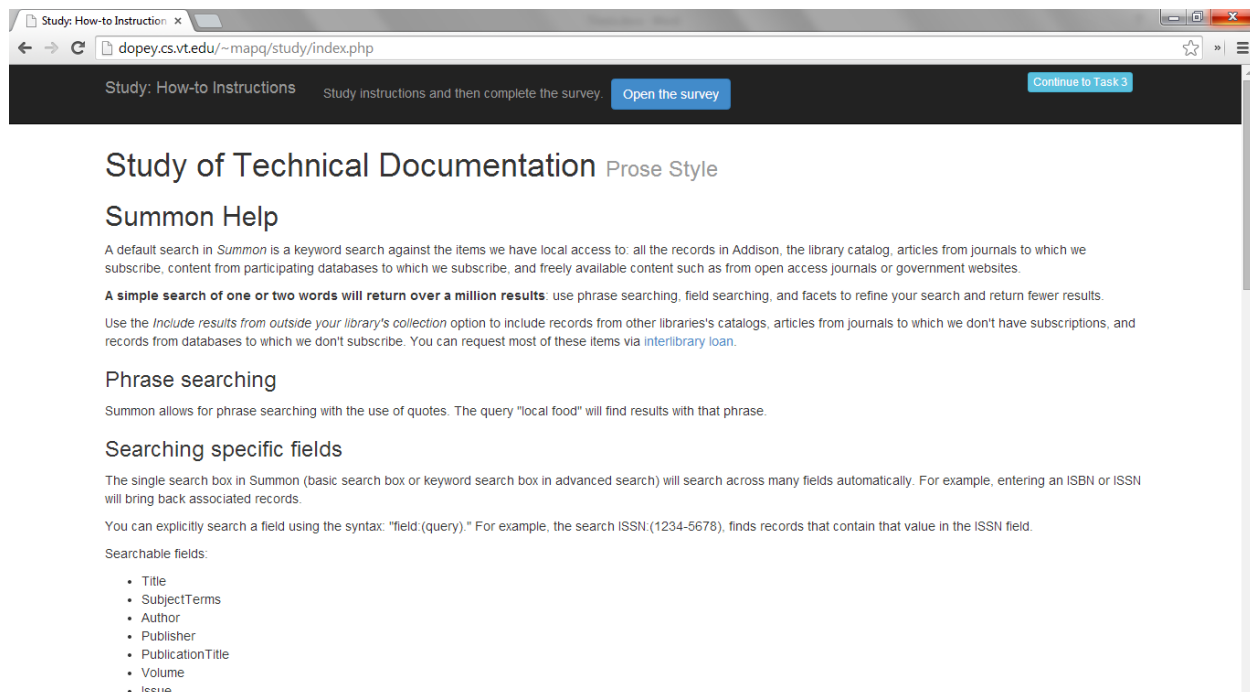


Figure 4.7: Task 3 OCS – Step-oriented Style

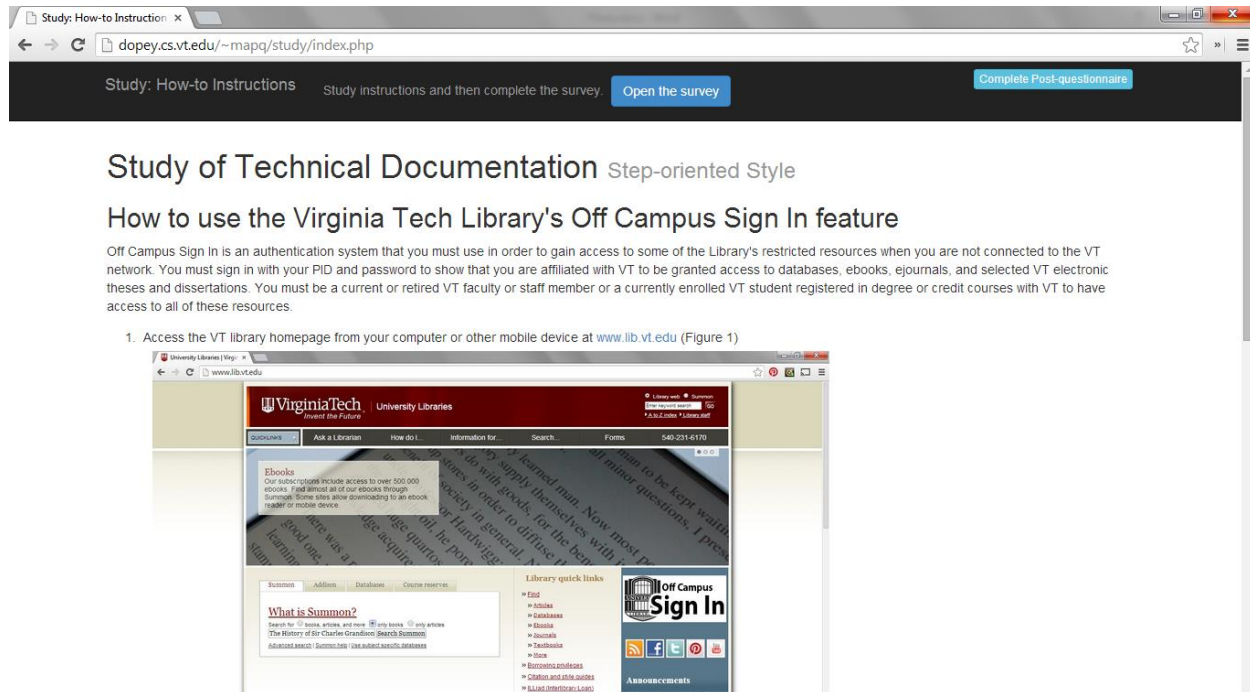


Figure 4.8: Task 1 RB – Step-oriented Style

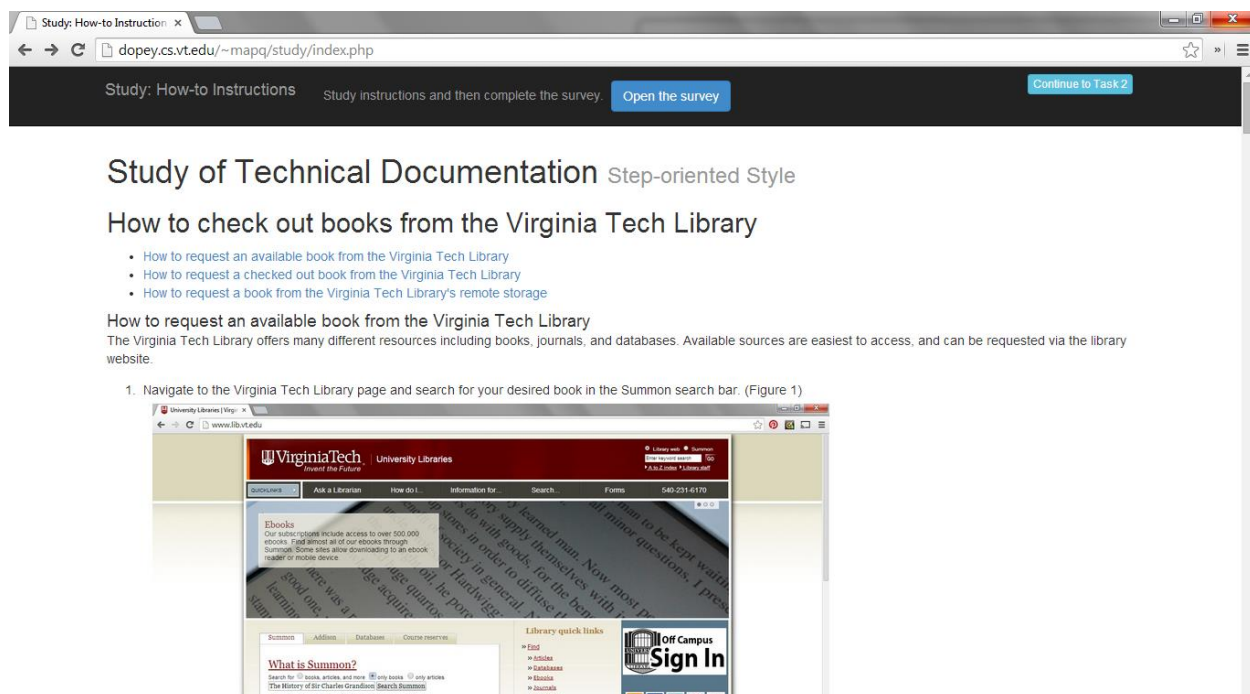


Figure 4.9: Task 2 SS – Comic Style

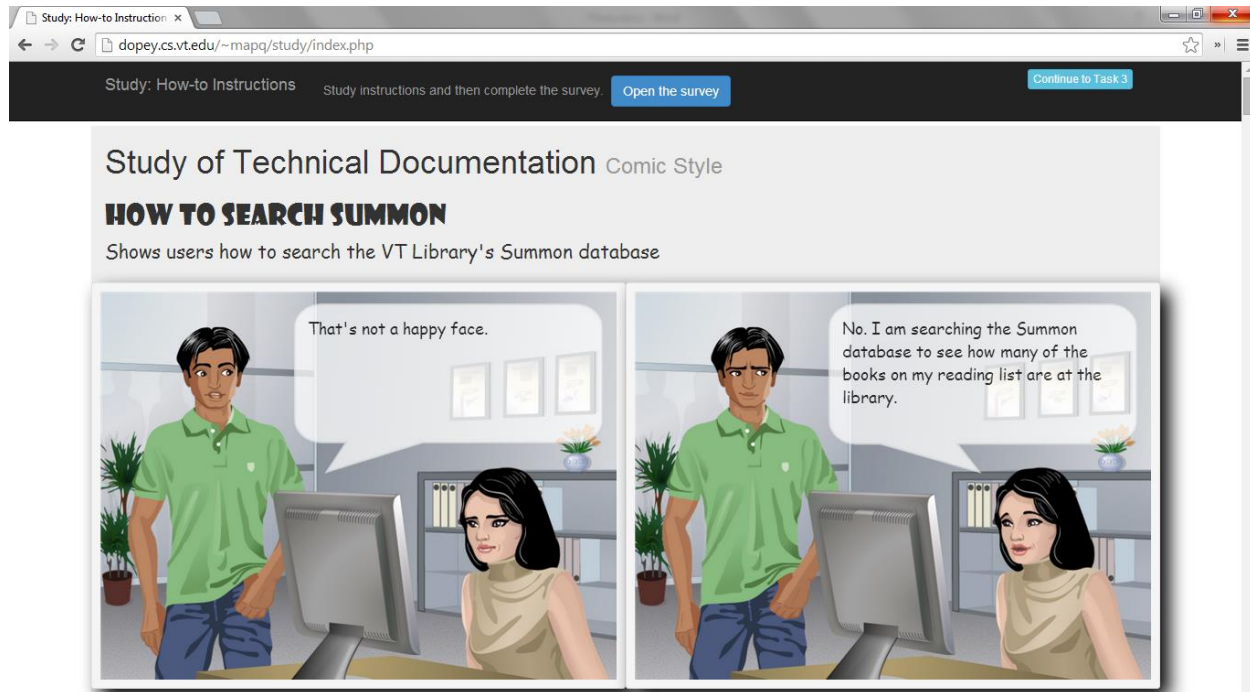
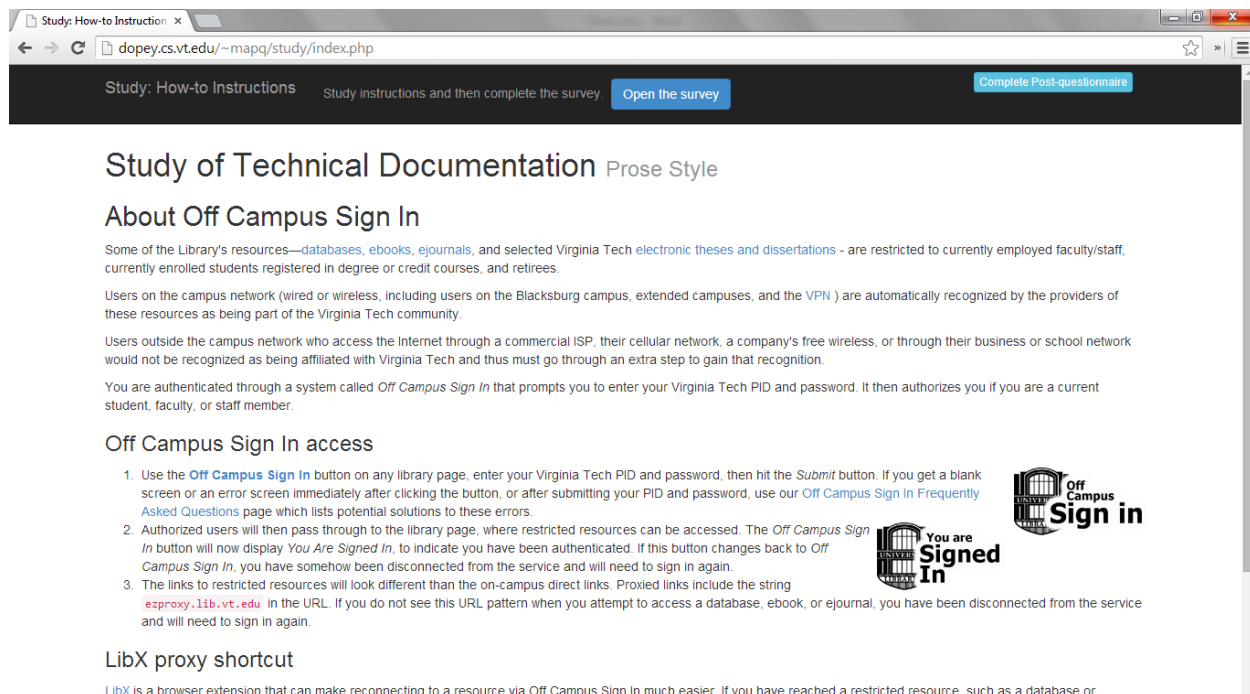


Figure 4.10: Task 3 OCS – Prose Style



Hypotheses

Hypothesis 1: *The Comic style will be significantly better in terms of understanding and participant evaluation than the Step-oriented and Prose styles.*

Hypothesis 1A: *The Step-oriented style will be significantly better in terms of understanding and participant evaluation than the Prose style.*

Hypothesis 2: *The Comic style will be significantly better in terms of visuals and examples than the Step-oriented and Prose styles.*

Hypothesis 3: *The Comic style will be significantly better in terms of emotional impact than the Step-oriented and Prose styles.*

Chapter 5: Results and Findings

An ANOVA was run on each of the following categories within each task:

- a. Overall Understanding
- b. Performance Understanding
- c. Comprehension

The overall understanding is a measure determining how many questions the participants were able to correctly answer, where the questions refer to the particular task. The performance understanding measured how many questions out of a set of true false questions the participants got correct. The last understanding category was the comprehension category comprised of short answer questions. While the true false performance understanding statements were based on how well the participant could distinguish the proper response, the comprehension short answer questions dealt more with the application of concepts from the how-to task or conceptual understanding, including the understanding of the end goal and purpose of the how-to task.

- d. Overall Evaluation
- e. Evaluation Elements
- f. Evaluation Statements

Similar to the overall understanding measure, the overall evaluation measure tabulated all responses to the evaluative, Likert-scale based questions. For the evaluation elements portion, the participant was asked to rate their satisfaction or dissatisfaction (satisfaction being on the lower side of the 1 to 7 Likert scale) with a given element of documentation style, organization, language, format, flow, visual aesthetics, visual effectiveness, and examples. The evaluation statements questions asked participants to rate how strongly he or she agreed or disagreed (agree being on the lower side of the 1 to 7 Likert scale) in reference to statements for evaluating technical documentation elements and their properties, such as “the language was clear,” or for evaluating user experience, such as “I enjoyed reading this how to documentation.” The evaluation questions were gathered from the IBM Press book “Developing Quality Technical Information,” [32].

- g. Visuals and Examples

The visuals and examples categorization is a subset of the evaluation Likert scale based questions, both the evaluation elements that deal with visuals, including visual aesthetics and visual effectiveness, and examples, as well as evaluation statements that include clarity and helpfulness of examples.

- h. Emotional

The emotional categorization is likewise a subset of the overall evaluation, rating questions. These related to visual aesthetics, how interesting the documentation was when read, and whether the participant enjoyed reading the how to documentation.

For the following sections, the analysis of each of the three tasks, the significance level used was $p < 0.05$.

Task 1 RB (Request a Book)

Overall Understanding

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.1. Figure 5.1 shows the means and significant differences found. For Task 1 RB, there was a significant difference found ($p < 0.05$) for the Overall Understanding category as can be seen in Table 5.2. In Table 5.3, the post-hoc Tukey Honest Significant Difference (HSD) test shows that the Step-oriented style had significantly better overall understanding scores than the Prose style ($p < 0.05$).

Table 5.1: Task 1 RB Overall Understanding score average for each of the three groups

Group	OverallUnderstanding
Comic	10.338028
Prose	11.075758
Step-oriented	9.956522

Figure 5.1: Averages for Task 1 RB Overall Understanding

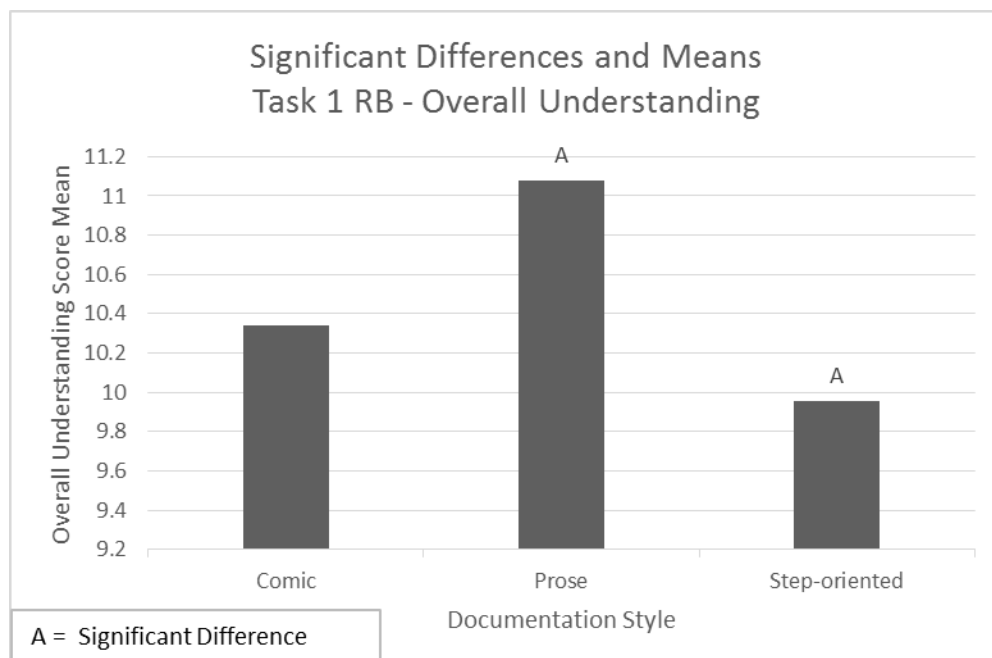


Table 5.2: Descriptive Statistics for Task 1 RB Overall Understanding

```
      Df Sum Sq Mean Sq F value Pr(>F)
Group    2   43.5   21.767    4.36  0.014 *
Residuals 203 1013.4    4.992
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness
```

Table 5.3: Tukey Post-Hoc Test for Task 1 RB Overall Understanding

```
Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = OverallUnderstanding ~ Group, data = t1)

$Group
      diff      lwr      upr    p adj
Prose-Comic      0.7377294 -0.1642551  1.6397139 0.1325997
Step-oriented-Comic -0.3815064 -1.2732711  0.5102582 0.5713541
Step-oriented-Prose -1.1192358 -2.0274961 -0.2109756 0.0111765
```

Performance Understanding

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.4. Figure 5.2 shows the means and significant differences found. There was a significant difference found for the Performance Understanding categorization. The one-way ANOVA test results ($p < 0.05$) can be seen in Table 5.5. The post-hoc Tukey HSD test revealed that Step-oriented style had significantly better performance understanding for the true false questions than the Prose styles. This can be seen in Table 5.6.

Table 5.4: Task 1 RB Performance Understanding score average for each of the three groups

```
Group PerformanceUnderstanding
Comic      4.112676
Prose      4.333333
Step-oriented 3.898551
```

Figure 5.2: Averages for Task 1 RB Performance Understanding

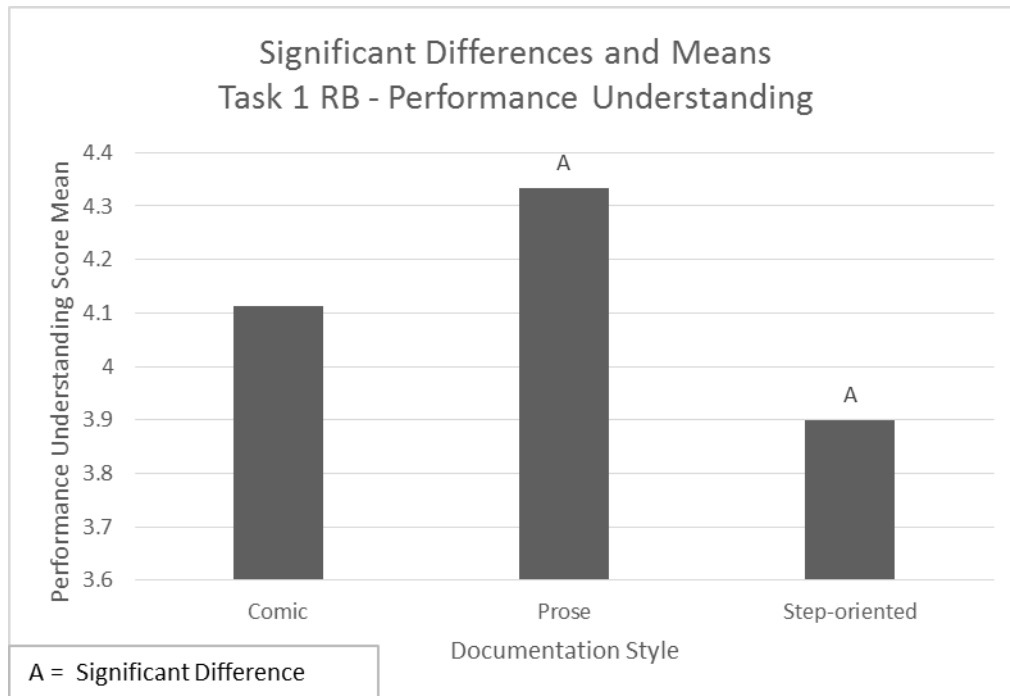


Table 5.5: Descriptive Statistics for Task 1 RB Performance Understanding

```

      Df Sum Sq Mean Sq F value Pr(>F)
Group    2   6.38   3.188   3.268 0.0401 *
Residuals 203 198.06   0.976

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness

```

Table 5.6: Tukey Post-Hoc Test for Task 1 RB Performance Understanding

```

Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = PerformanceUnderstanding ~ Group, data = t1)

$Group
      diff      lwr      upr      p adj
Prose-Comic      0.2206573 -0.1780979  0.61941248 0.3931840
Step-oriented-Comic -0.2141253 -0.6083625  0.18011180 0.4067499
Step-oriented-Prose -0.4347826 -0.8363122 -0.03325298 0.0302586

```

Comprehension

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.7. Figure 5.3 shows the means and significant differences found. For the Comprehension categorization, there was no significant difference found from the results of the one-way ANOVA that can be seen in Table 5.8.

Table 5.7: Task 1 RB Comprehension score average for each of the three groups

Group	Comprehension
Comic	7.450704
Prose	7.954545
Step-oriented	7.391304

Figure 5.3: Averages for Task 1 RB Comprehension

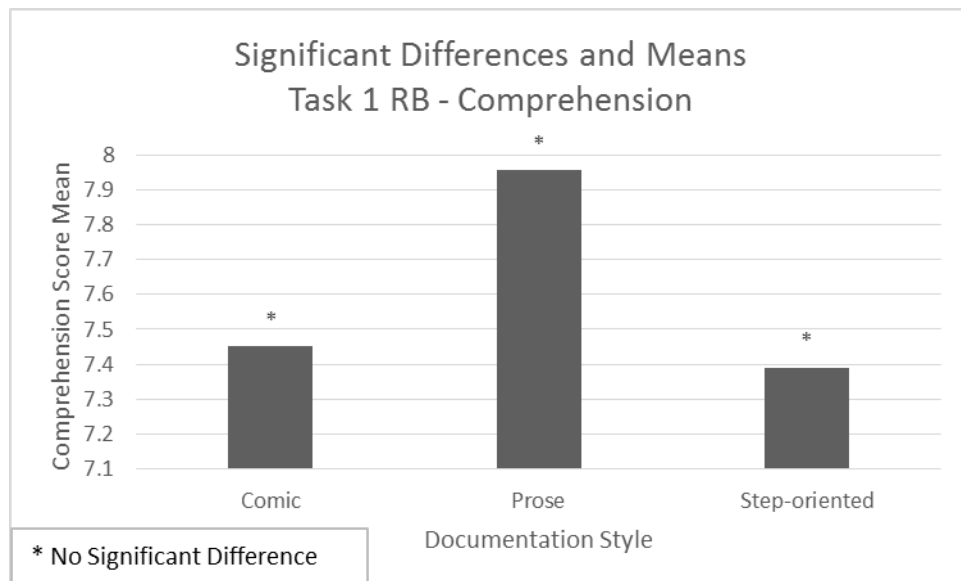


Table 5.8: Descriptive Statistics for Task 1 RB Comprehension

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	12.9	6.436	1.395	0.25
Residuals	203	936.9	4.615		
13 observations deleted due to missingness					

Overall Evaluation

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.9. Figure 5.4 shows the means and significant differences found. There was a significant difference ($p < 0.05$) reported by the one-way ANOVA for the Overall Evaluation category, as can be seen in Table 5.10. The Tukey HSD post-hoc test, Table 5.11, showed that the Step-oriented style received significantly better satisfaction ratings, lower numbers on the Likert evaluation scale, than the Prose style.

Table 5.9: Task 1 RB Overall Evaluation score average for each of the three groups

Group	OverallEvaluation
Comic	52.21127
Prose	56.51515
Step-oriented	47.42029

Figure 5.4: Averages for Task 1 RB Overall Evaluation

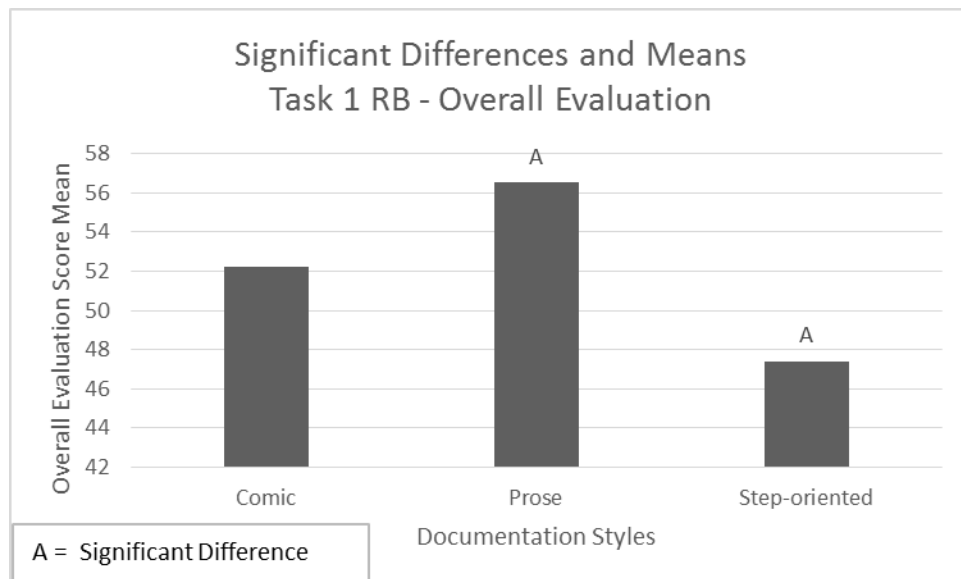


Table 5.10: Descriptive Statistics for Task 1 RB Overall Evaluation

```
      Df Sum Sq Mean Sq F value Pr(>F)
Group    2   2796   1397.9    4.214 0.0161 *
Residuals 203  67335    331.7
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness
```

Table 5.11: Tukey Post-Hoc Test for Task 1 RB Overall Evaluation

```
Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = OverallEvaluation ~ Group, data = t1)

$Group
      diff      lwr      upr    p adj
Prose-Comic    4.303884 -3.048602 11.656369 0.3521963
Step-oriented-Comic -4.790978 -12.060156  2.478201 0.2671843
Step-oriented-Prose -9.094862 -16.498504 -1.691220 0.0114835
```

Evaluation Elements

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.12. Figure 5.5 shows the means and significant differences found. The one-way ANOVA showed a significant difference for the Evaluation Elements categorization ($p < 0.01$) as can be seen in Table 5.13. Similarly to the above tests, the post-hoc Tukey HSD, Table 5.14, revealed that the Step-oriented style received significantly better (lower values on the scale) satisfaction ratings than the Prose style.

Table 5.12: Task 1 RB Evaluation Elements score average for each of the three groups

```
Group EvaluationElements
Comic          21.91549
Prose          23.48485
Step-oriented  18.86957
```

Figure 5.5: Averages for Task 1 RB Evaluation Elements

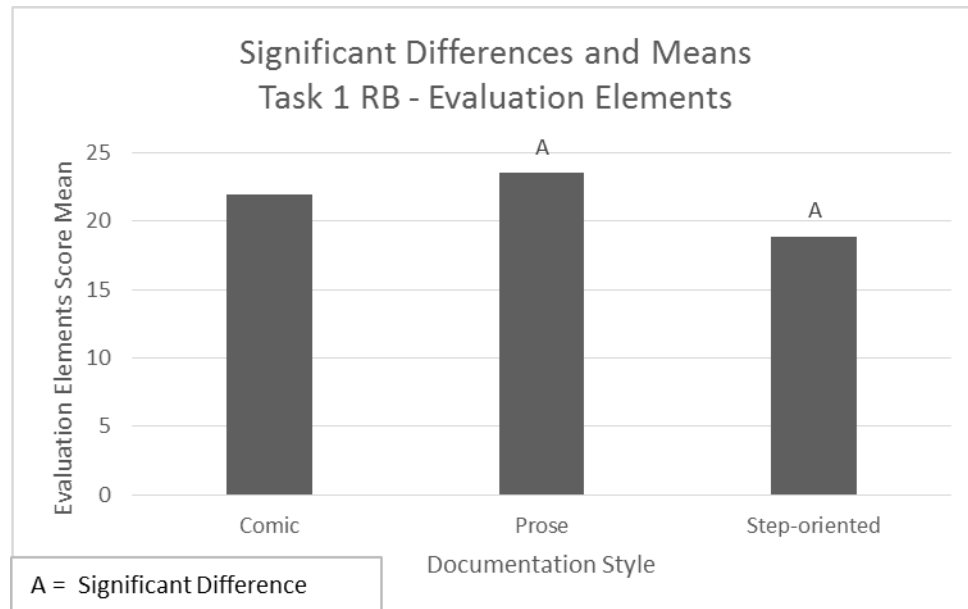


Table 5.13: Descriptive Statistics for Task 1 RB Evaluation Elements

```

      Df Sum Sq Mean Sq F value Pr(>F)
Group    2    748   373.8    5.086  0.007 **
Residuals 203 14920    73.5
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness

```

Table 5.14: Tukey Post-Hoc Test for Task 1 RB Evaluation Elements

```

Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = EvaluationElements ~ Group, data = t1)

$Group
      diff      lwr      upr    p adj
Prose-Comic      1.569356 -1.891591  5.0303021  0.5334099
Step-oriented-Comic -3.045928 -6.467660  0.3758047  0.0920040
Step-oriented-Prose -4.615283 -8.100310 -1.1302565  0.0057260

```

Evaluation Statements

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.15. Figure 5.6 shows the means and significant differences found. For the Evaluation Statements category there was also a significant difference ($p < 0.05$) as can be seen from the results of the one-way ANOVA test, Table 5.16. A the Tukey post-hoc test revealed that the Step-oriented style received significantly better satisfaction ratings (lower on the scale) than the Prose, Table 5.17.

Table 5.15: Task 1 RB Evaluation Statements score average for each of the three groups

Group	EvaluationStatements
Comic	30.29577
Prose	33.03030
Step-oriented	28.55072

Figure 5.6: Averages for Task 1 RB Evaluation Statements

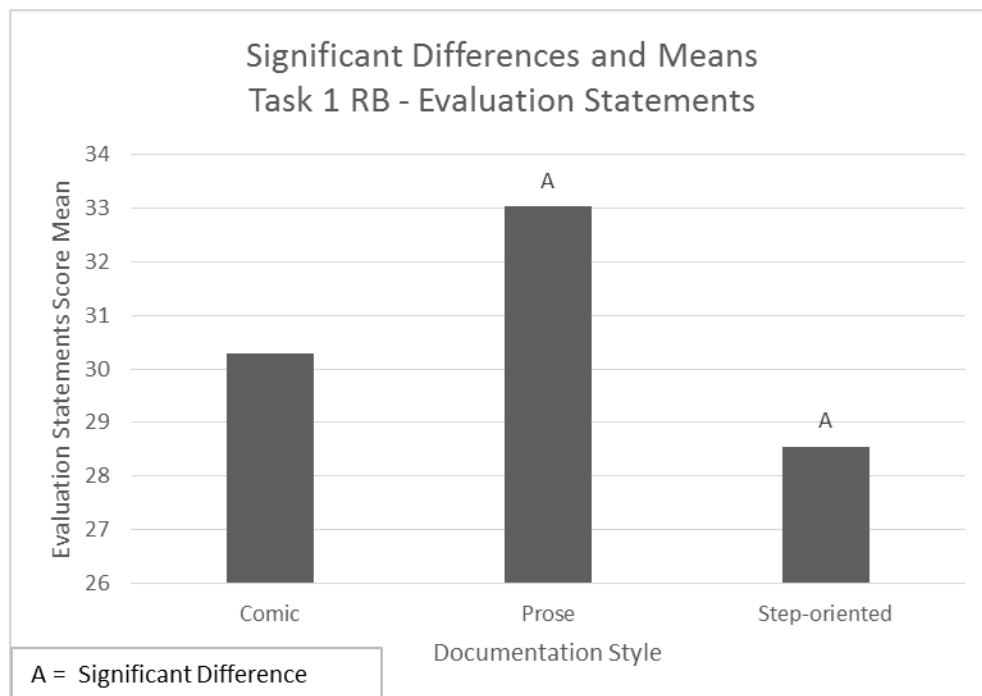


Table 5.16: Descriptive Statistics for Task 1 RB Evaluation Statements

```

      Df Sum Sq Mean Sq F value Pr(>F)
Group    2    686   343.1    3.202  0.0427 *
Residuals 203  21748   107.1
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness

```

Table 5.17: Tukey Post-Hoc Test for Task 1 RB Evaluation Statements

```

Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = EvaluationStatements ~ Group, data = t1)

$Group
      diff      lwr      upr      p adj
Prose-Comic      2.734528 -1.443977  6.9130342  0.2721372
Step-oriented-Comic -1.745050 -5.876211  2.3861114  0.5793937
Step-oriented-Prose -4.479578 -8.687157 -0.2719998  0.0338877

```

Evaluation Visuals and Examples

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.18. Figure 5.7 shows the means and significant differences found. A significant difference ($p < 0.001$) was found between the Prose and Comic as well as the Step-oriented and Prose pair for the ANOVA, Table 5.19, run on the Visuals and Examples categorization. The post-hoc Tukey HSD test, Table 5.20, revealed that both the Comic style and Step-oriented style separately received significantly better evaluation ratings in terms of visuals and examples.

Table 5.18: Task 1 RB Evalaution Visuals and Examples score average for each of the three groups

```

      Group VisualsAndExamples
Comic      13.77465
Prose      19.04545
Step-oriented 12.69565

```

Figure 5.7: Averages for Task 1 RB Evaluation Visuals and Examples

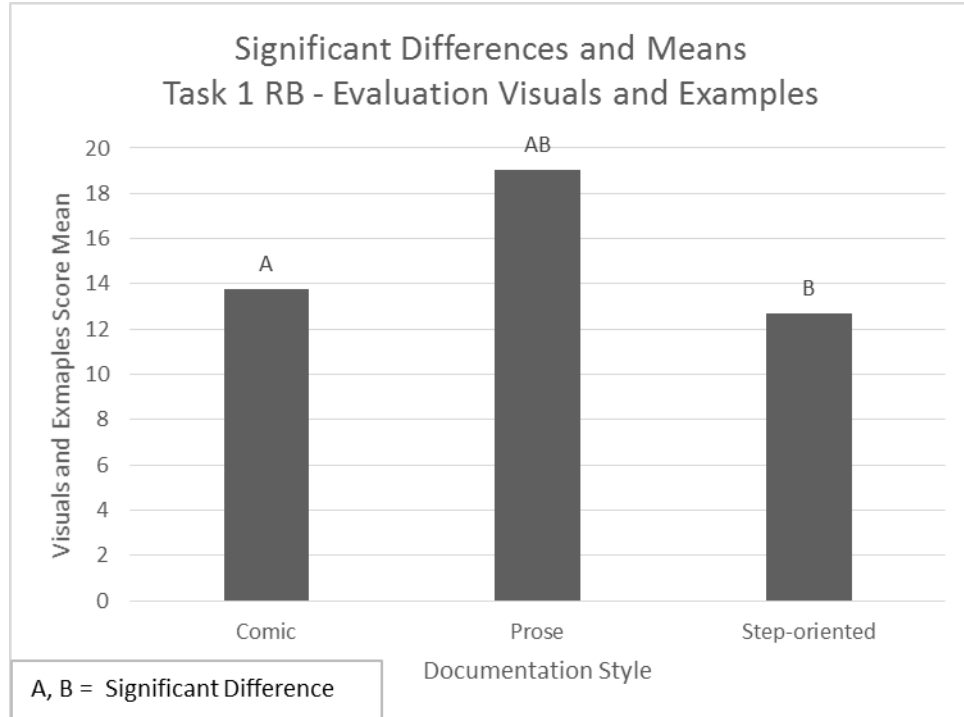


Table 5.19: Descriptive Statistics for Task 1 RB Evaluation Visuals and Examples

```

      Df Sum Sq Mean Sq F value    Pr(>F)
Group      2    1551    775.5    17.32 1.14e-07 ***
Residuals 203    9092     44.8
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness

```

Table 5.20: Tukey Post-Hoc Test for Task 1 RB Evaluation Visuals and Examples

```

Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = VisualsAndExamples ~ Group, data = t1)

$Group
      diff      lwr      upr    p adj
Prose-Comic      5.270807  2.569090  7.972524 0.0000215
Step-oriented-Comic -1.078996 -3.750101  1.592110 0.6069468
Step-oriented-Prose -6.349802 -9.070317 -3.629288 0.0000003

```

Evaluation Emotional

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.21. Figure 5.8 shows the means and significant differences found. Given the ANOVA run for the Emotional categorization, a significant difference was found ($p < 0.01$) and can be seen in Table 5.22. Post-hoc analysis, Table 5.23, using the Tukey HSD test showed that the significant difference here was twofold between the Prose and Comic pair as well as the Step-oriented and Prose pair. The styles of these pairs that had significantly better ratings for the emotional category were the Comic and Step-oriented styles respective to the above given pairs.

Table 5.21: Task 1 RB Evaluation Emotional score average for each of the three groups

Group	Emotional
Comic	10.43662
Prose	12.54545
Step-oriented	10.57971

Figure 5.8: Averages for Task 1 RB Evaluation Emotional

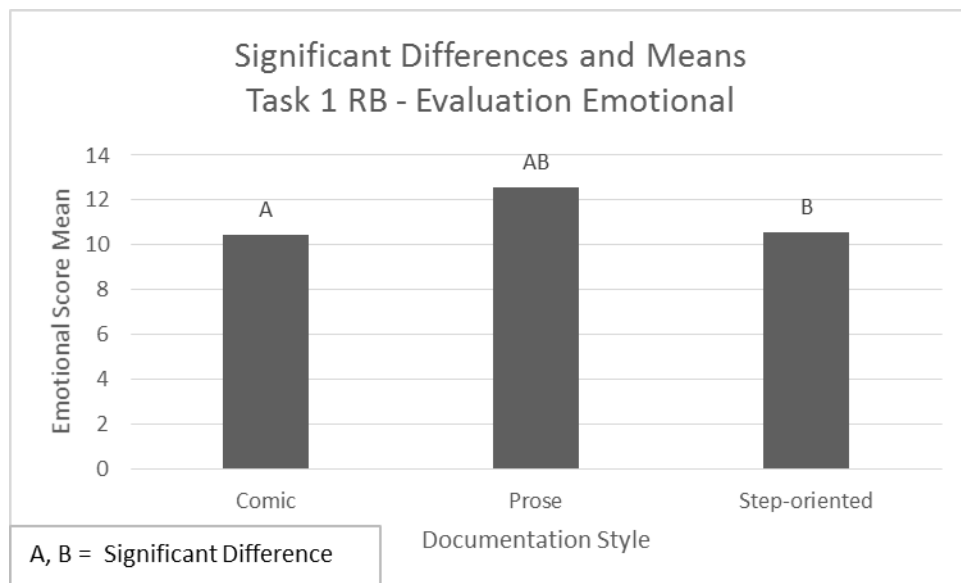


Table 5.22: Descriptive Statistics for Task 1 RB Evaluation Emotional

```
      Df Sum Sq Mean Sq F value Pr(>F)
Group    2  187.1    93.54   6.444 0.00193 **
Residuals 203 2946.6    14.52
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness
```

Table 5.23: Tukey Post-Hoc Test for Task 1 RB Evaluation Emotional

```
Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = Emotional ~ Group, data = t1)

$Group
      diff      lwr      upr      p adj
Prose-Comic    2.1088348  0.5707621  3.6469076 0.0040123
Step-oriented-Comic 0.1430904 -1.3775553  1.6637361 0.9731600
Step-oriented-Prose -1.9657444 -3.5145186 -0.4169702 0.0085880
```

Task 2 SS (Summon Search)

Overall Understanding

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.24. Figure 5.9 shows the means and significant differences found. For Task 2, Summon Search, there was no significant difference found from the one-way ANOVA as can be seen in Table 5.25.

Table 5.24: Task 2 SS Overall Understanding score average for each of the three groups

```
      Group OverallUnderstanding
      Comic          8.304348
      Prose          8.169014
Step-oriented  7.227273
```


Figure 5.9: Averages for Task 2 SS Overall Understanding

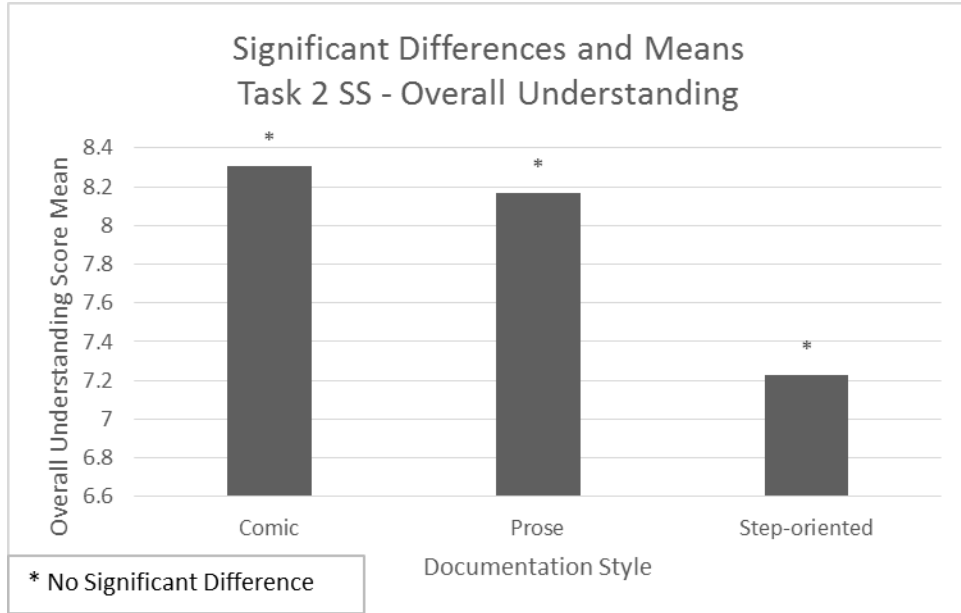


Table 5.25: Descriptive Statistics for Task 2 SS Overall Understanding

```

      Df Sum Sq Mean Sq F value Pr(>F)
Group    2   46.3   23.128    2.343 0.0987 .
Residuals 203 2004.2    9.873
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Performance Understanding

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.26. Figure 5.10 shows the means and significant differences found. There was no significant difference found when the one-way ANOVA was run for the Performance Understanding categorization, as can be seen in Table 5.27.

Table 5.26: Task 2 SS Performance Understanding score average for each of the three groups

```

Group PerformanceUnderstanding
Comic                2.449275
Prose                2.535211
Step-oriented        2.272727

```

Figure 5.10: Averages for Task 2 SS Performance Understanding

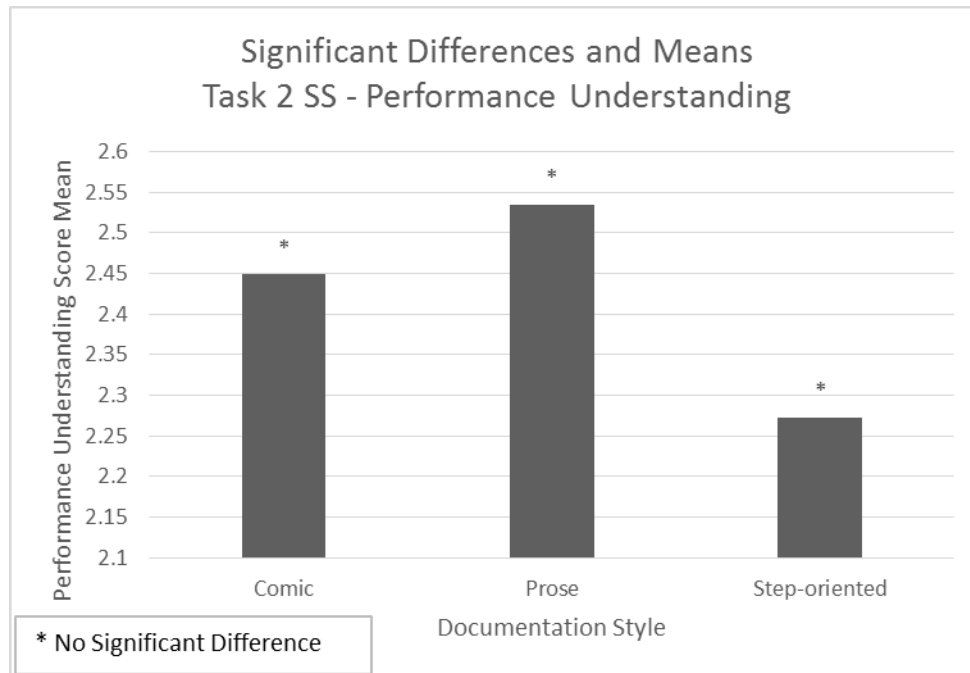


Table 5.27: Descriptive Statistics for Task 2 SS Performance Understanding

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	2.43	1.216	1.093	0.337
Residuals	203	225.83	1.112		

Comprehension

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.28. Figure 5.11 shows the means and significant differences found. For the Comprehension categorization, there was no significant difference reported from the one-way ANOVA, as can be seen in Table 5.29.

Table 5.28: Task 2 SS Comprehension score average for each of the three groups

Group	Comprehension
Comic	5.855072
Prose	5.633803
Step-oriented	4.954545

Figure 5.11: Averages for Task 2 SS Comprehension

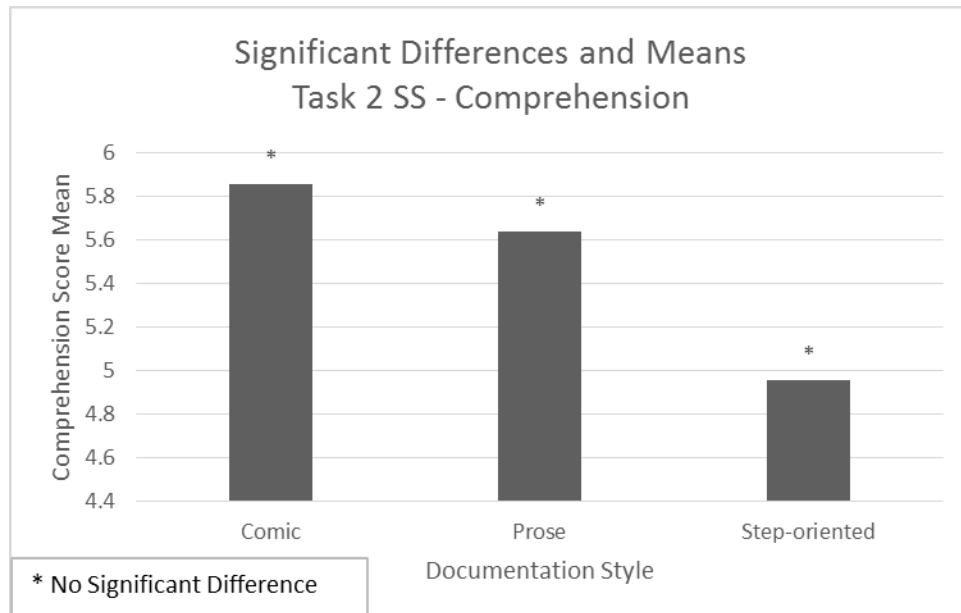


Table 5.29: Descriptive Statistics for Task 2 SS Comprehension

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	29.6	14.794	1.668	0.191
Residuals	203	1799.9	8.866		

Overall Evaluation

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.30. Figure 5.12 shows the means and significant differences found. Likewise, for the Evaluation category, there was no significant difference found, as can be seen in Table 5.31.

Table 5.30: Task 2 SS Overall Evaluation score average for each of the three groups

Group	OverallEvaluation
Comic	48.26087
Prose	54.08451
Step-oriented	48.98485

Figure 5.12: Averages for Task 2 SS Overall Evaluation

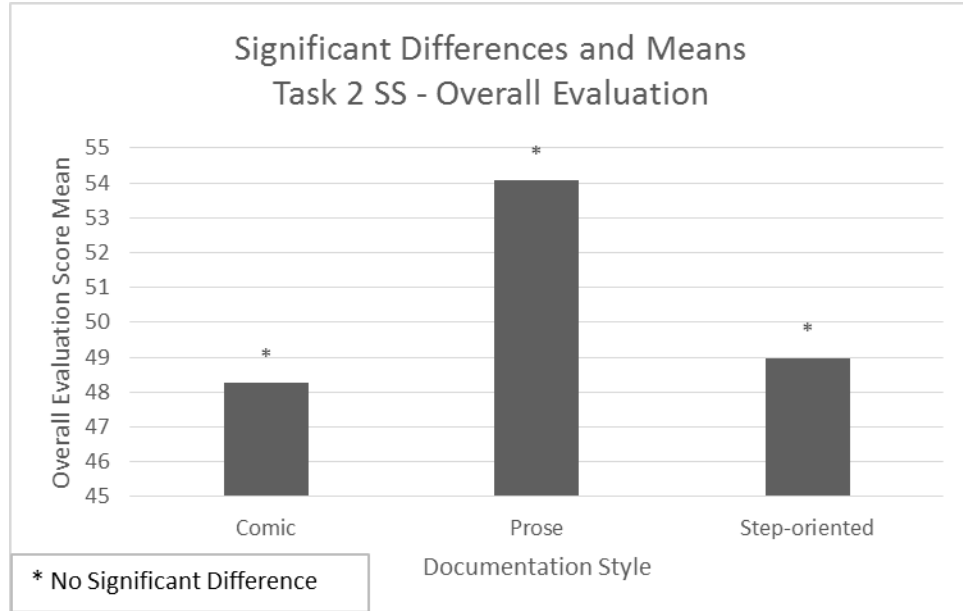


Table 5.31: Descriptive Statistics for Task 2 SS Overall Evaluation

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	1410	704.9	1.66	0.193
Residuals	203	86202	424.6		

Evaluation Elements

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.32. Figure 5.13 shows the means and significant differences found. There was a significant difference ($p < 0.01$) found for the Evaluation Elements categorization one-way ANOVA, Table 5.33. The post-hoc Tukey HSD test, Table 5.34, showed that the Step-oriented style received significantly better element evaluations than the Prose style.

Table 5.32: Task 2 SS Evaluation Elements score average for each of the three groups

Group	EvaluationElements
Comic	19.63768
Prose	23.23944
Step-oriented	18.34848

Figure 5.13: Averages for Task 2 SS Evaluation Elements

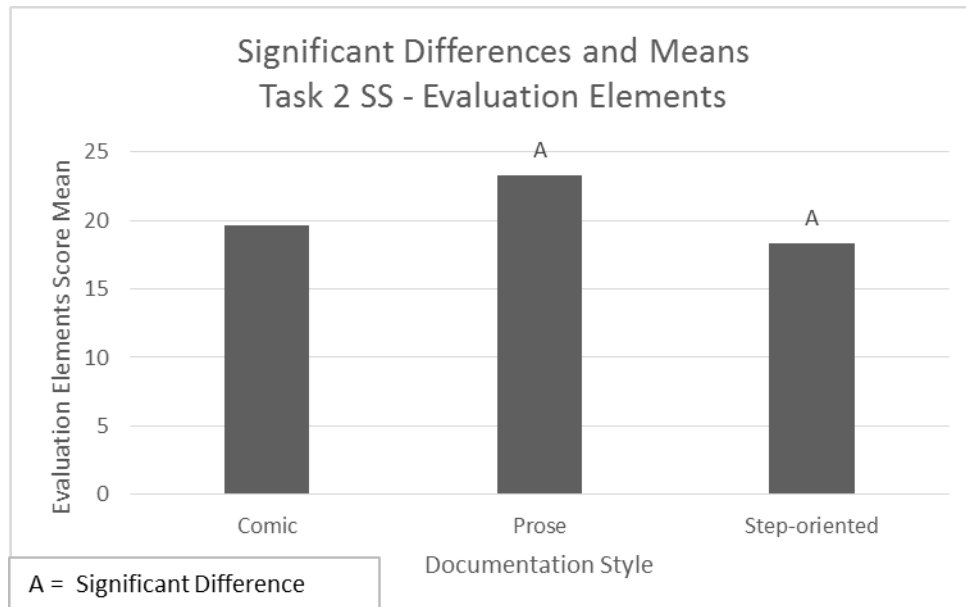


Table 5.33: Descriptive Statistics for Task 2 SS Evaluation Elements

```

      Df Sum Sq Mean Sq F value    Pr(>F)
Group    2    889   444.7    5.062 0.00716 **
Residuals 203  17834    87.9
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Table 5.34: Tukey Post-Hoc Test for Task 2 SS Evaluation Elements

```

Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = EvaluationElements ~ Group, data = t2)

$Group
      diff      lwr      upr    p adj
Prose-Comic      3.601755 -0.1392395  7.342750 0.0619261
Step-oriented-Comic -1.289196 -5.0993913  2.520999 0.7041453
Step-oriented-Prose -4.890952 -8.6748197 -1.107084 0.0072452

```

Evaluation Statements

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.35. Figure 5.14 shows the means and significant differences found. For the ANOVA run on the Evaluation Statements categorization, Table 5.36, there was no significant difference reported.

Table 5.35: Task 2 SS Evaluation Statements score average for each of the three groups

Group	EvaluationStatements
Comic	28.62319
Prose	30.84507
Step-oriented	30.63636

Figure 5.14: Averages for Task 2 SS Evaluation Statements

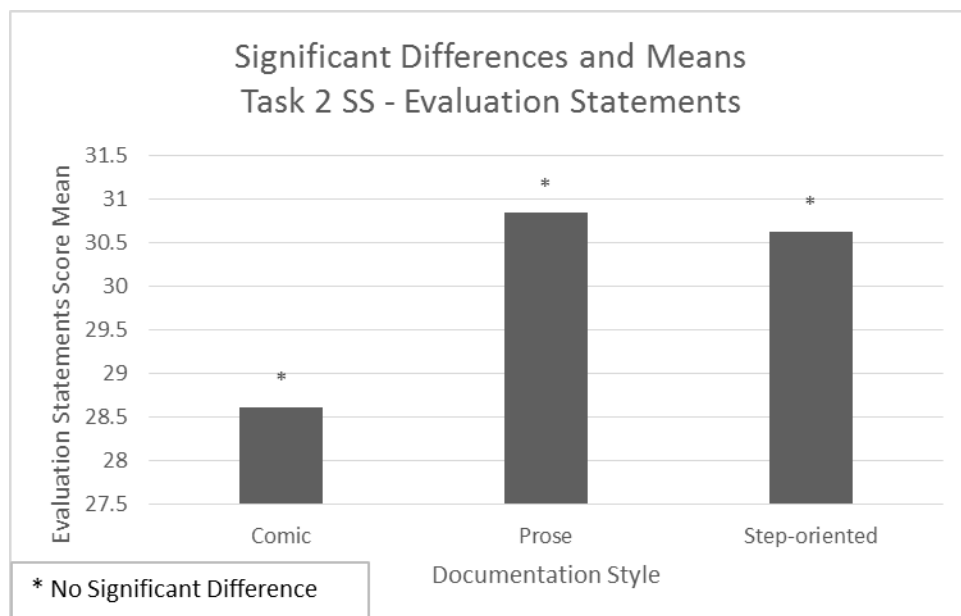


Table 5.36: Descriptive Statistics for Task 2 SS Evaluation Statements

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	208	104.0	0.734	0.481
Residuals	203	28763	141.7		

Evaluation Visuals and Examples

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.37. Figure 5.15 shows the means and significant differences found. A significant difference was found ($p < 0.001$) for the Visuals and Examples categorization, Table 5.38, where the post-hoc Tukey HSD test, Table 5.39, revealed that the Comic style along with the Step-oriented style received significantly better ratings for visuals and examples than the Prose style.

Table 5.37: Task 2 SS Evaluation Visuals and Examples score average for each of the three groups

Group	VisualsAndExamples
Comic	12.40580
Prose	17.40845
Step-oriented	13.71212

Figure 5.15: Averages for Task 2 SS Evaluation Visuals and Examples

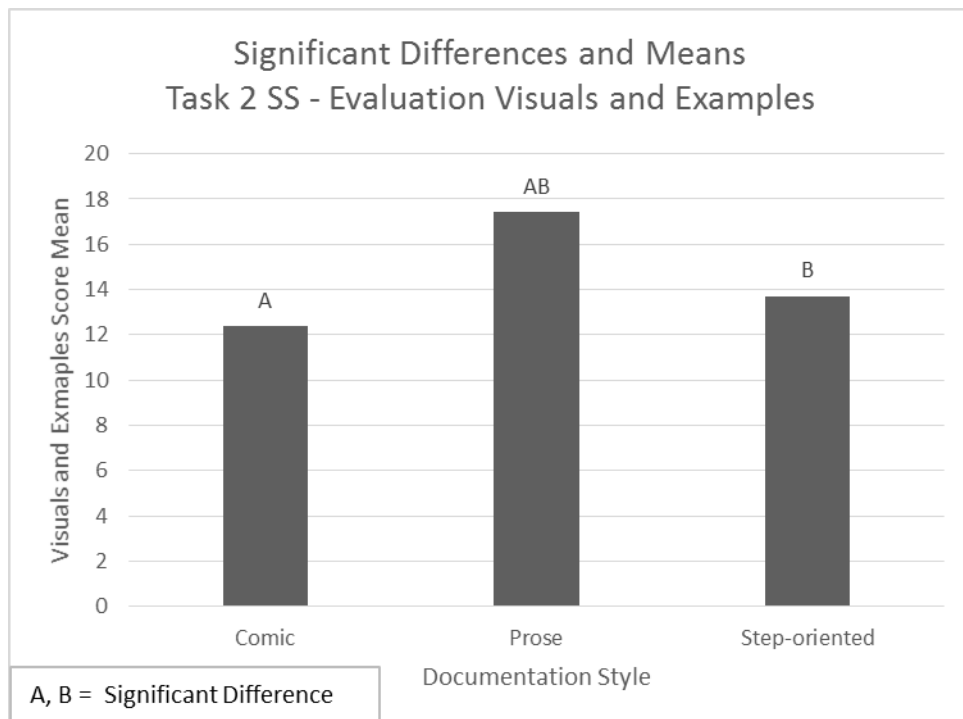


Table 5.38: Descriptive Statistics for Task 2 SS Evaluation Visuals and Examples

```
      Df Sum Sq Mean Sq F value    Pr(>F)
Group      2     944    471.8    9.243 0.000144 ***
Residuals 203   10363     51.1
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table 5.39: Tukey Post-Hoc Test for Task 2 SS Evaluation Visuals and Examples

```
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = VisualsAndExamples ~ Group, data = t2)

$Group
      diff      lwr      upr    p adj
Prose-Comic      5.002654  2.150887  7.8544204 0.0001491
Step-oriented-Comic 1.306324 -1.598194  4.2108422 0.5388436
Step-oriented-Prose -3.696329 -6.580778 -0.8118806 0.0078583
```

Evaluation Emotional

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.40. Figure 5.16 shows the means and significant differences found. Similarly, for the ANOVA run on the Emotional categorization, a significant difference ($p < 0.001$) was found and can be seen in Table 5.41. In Table 5.42, we can see that the Comic and Step-oriented styles each received significantly better scores in terms of the Emotional category than the Prose style.

Table 5.40: Task 2 SS Evaluation Emotional score average for each of the three groups

```
Group Emotional
Comic  8.144928
Prose 12.647887
Step-oriented 9.151515
```

Figure 5.16: Averages for Task 2 SS Evaluation Emotional

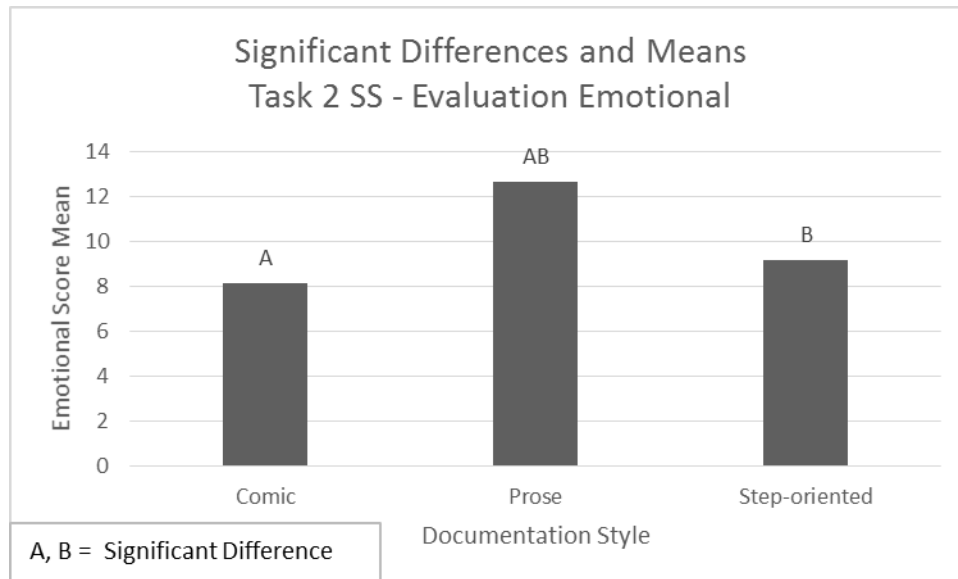


Table 5.41: Descriptive Statistics for Task 2 SS Evaluation Emotional

```

      Df Sum Sq Mean Sq F value    Pr(>F)
Group      2    783   391.3    19.16 2.39e-08 ***
Residuals 203   4147    20.4
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Table 5.42: Tukey Post-Hoc Test for Task 2 SS Evaluation Emotional

```

Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = Emotional ~ Group, data = t2)

$Group
      diff      lwr      upr    p adj
Prose-Comic      4.502960  2.6989300  6.306990 0.0000000
Step-oriented-Comic  1.006588 -0.8308126  2.843988 0.4004965
Step-oriented-Prose -3.496372 -5.3210767 -1.671668 0.0000306

```

Task 3 OCS (Off Campus Sign In)

Overall Understanding

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.43. Figure 5.17 shows the means and significant differences found. For Task 3 OCS, there was no significant difference reported, as can be seen in Table 5.44.

Table 5.43: Task 3 OCS Overall Understanding score average for each of the three groups

Group	OverallUnderstanding
Comic	8.484848
Prose	8.942029
Step-oriented	8.746479

Figure 5.17: Averages for Task 3 OCS Overall Understanding

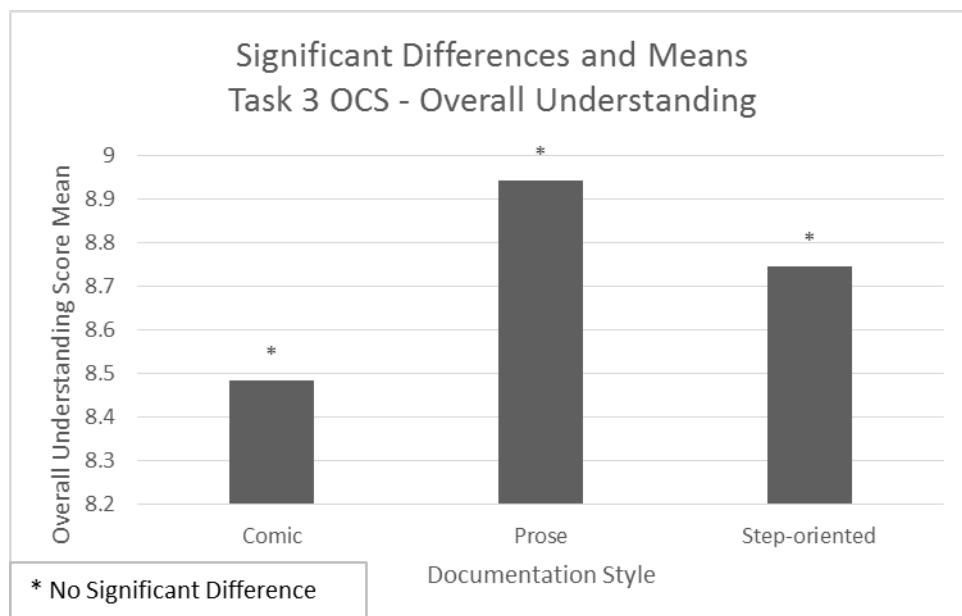


Table 5.44: Descriptive Statistics for Task 3 OCS Overall Understanding

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	7.1	3.544	0.725	0.485
Residuals	203	991.7	4.885		

Performance Understanding

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.45. Figure 5.18 shows the means and significant differences found. There was no significant difference found from the one-way ANOVA run for the Performance Understanding categorization, as can be seen in 5.46.

Table 5.45: Task 3 OCS Performance Understanding score average for each of the three groups

Group	PerformanceUnderstanding
Comic	3.242424
Prose	3.202899
Step-oriented	3.098592

Figure 5.18: Averages for Task 3 OCS Performance Understanding

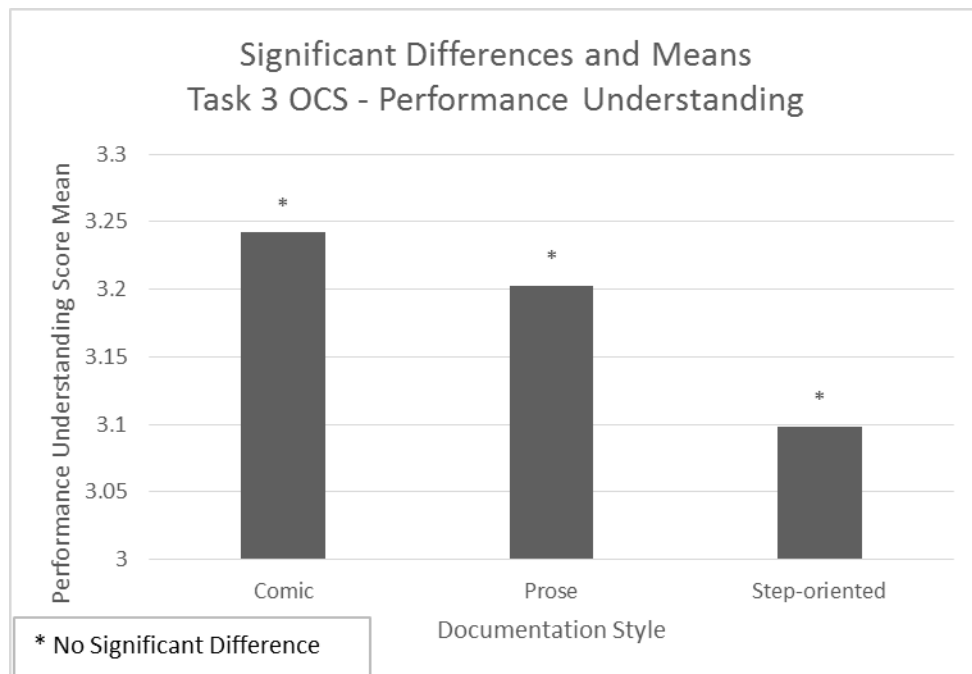


Table 5.46: Descriptive Statistics for Task 3 OCS Performance Understanding

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	0.76	0.3819	0.37	0.691
Residuals	203	209.59	1.0325		

Comprehension

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.47. Figure 5.19 shows the means and significant differences found. There was no significant difference found for the Comprehension categorization one-way ANOVA, as can be seen in Table 5.48.

Table 5.47: Task 3 OCS Comprehension score average for each of the three groups

Group	Comprehension
Comic	5.242424
Prose	5.739130
Step-oriented	5.647887

Figure 5.19: Averages for Task 3 OCS Comprehension

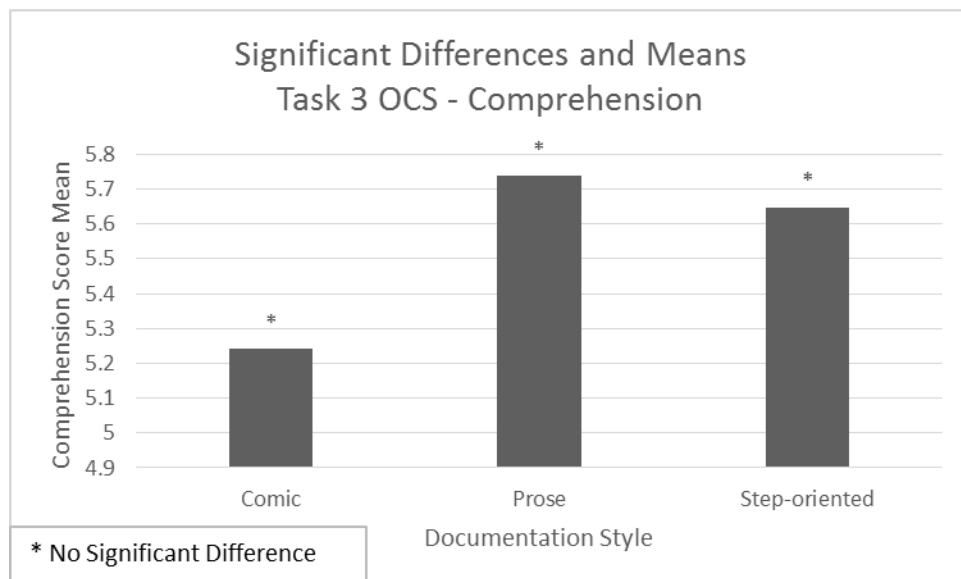


Table 5.48: Descriptive Statistics for Task 3 OCS Comprehension

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	9.4	4.696	1.639	0.197
Residuals	203	581.6	2.865		

Overall Evaluation

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.49. Figure 5.20 shows the means and significant differences found. There was a significant difference found ($p < 0.05$) for the overall Evaluation category, as can be seen in Table 5.50. The post-hoc Tukey HSD test, Table 5.51, reveals that the Step-oriented style received significantly better evaluation scores than Prose.

Table 5.49: Task 3 OCS Overall Evaluation score average for each of the three groups

Group	OverallEvaluation
Comic	45.03030
Prose	50.50725
Step-oriented	38.26761

Figure 5.20: Averages for Task 3 OCS Overall Evaluation

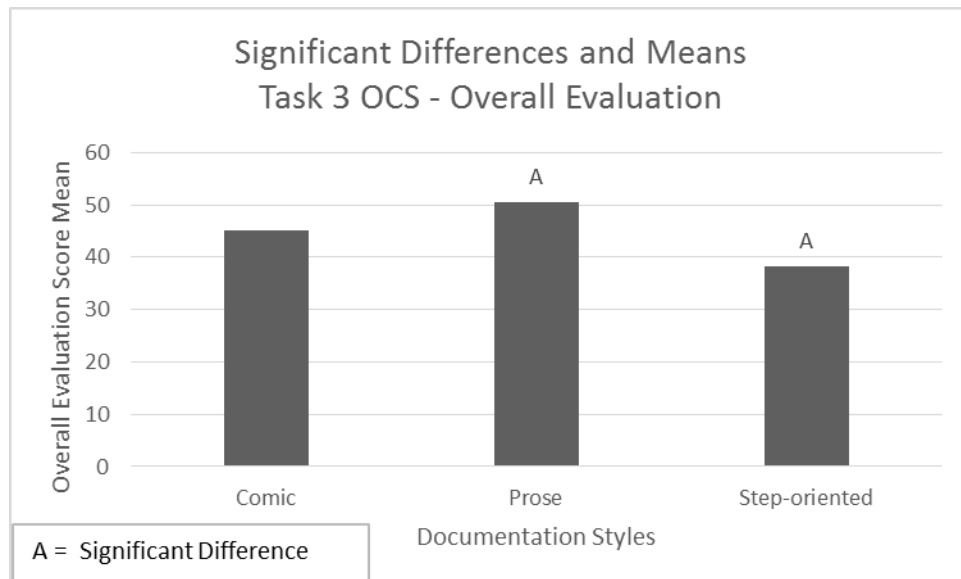


Table 5.50: Descriptive Statistics for Task 3 OCS Overall Evaluation

```

      Df Sum Sq Mean Sq F value Pr(>F)
Group      2    2796    1397.9    4.214 0.0161 *
Residuals 203   67335     331.7

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
13 observations deleted due to missingness

```

Table 5.51: Tukey Post-Hoc Test for Task 3 OCS Overall Evaluation

```
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = OverallEvaluation ~ Group, data = t3)

$Group
              diff          lwr          upr      p adj
Prose-Comic      5.476943   -2.619927  13.573813  0.2492312
Step-oriented-Comic -6.762697 -14.803621   1.278226  0.1183269
Step-oriented-Prose -12.239641 -20.189457  -4.289824  0.0010227
```

Evaluation Elements

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.52. Figure 5.21 shows the means and significant differences found. The ANOVA run for the Evaluation Elements categorization, Table 5.53, shows a significant difference ($p < 0.001$). The Step-oriented style received significantly better evaluations of the elements than the Prose style, as can be seen in the Tukey HSD test, Table 5.54.

Table 5.52: Task 3 OCS Evaluation Elements score average for each of the three groups

Group	EvaluationElements
Comic	18.48485
Prose	20.55072
Step-oriented	14.46479

Figure 5.21: Averages for Task 3 OCS Evaluation Elements

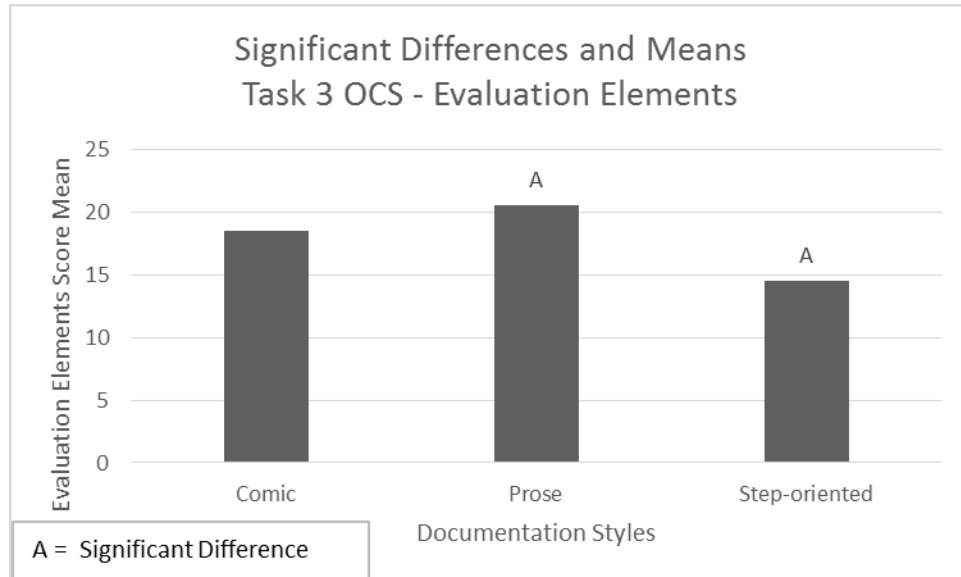


Table 5.53: Descriptive Statistics for Task 3 OCS Evaluation Elements

```

      Df Sum Sq Mean Sq F value    Pr(>F)
Group    2   1343    671.4    8.289 0.000346 ***
Residuals 203  16443     81.0
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Table 5.54: Tukey Post-Hoc Test for Task 3 OCS Evaluation Elements

```

Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = EvaluationElements ~ Group, data = t3)

$Group
      diff      lwr      upr    p adj
Prose-Comic      2.065876 -1.592750  5.7245019 0.3784583
Step-oriented-Comic -4.020060 -7.653406 -0.3867137 0.0260492
Step-oriented-Prose -6.085936 -9.678114 -2.4937573 0.0002606

```

Evaluation Statements

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.55. Figure 5.22 shows the means and significant differences found. Likewise, a significant difference ($p < 0.01$) was found for the Evaluation Statements categorization as can be seen in Table 5.56. The Tukey HSD post-hoc test, Table 5.57, showed that the Step-oriented style received significantly better statement evaluation scores than the Prose style.

Table 5.55: Task 3 OCS Evaluation Statements score average for each of the three groups

Group	EvaluationStatements
Comic	26.54545
Prose	29.95652
Step-oriented	23.80282

Figure 5.22: Averages for Task 3 OCS Evaluation Statements

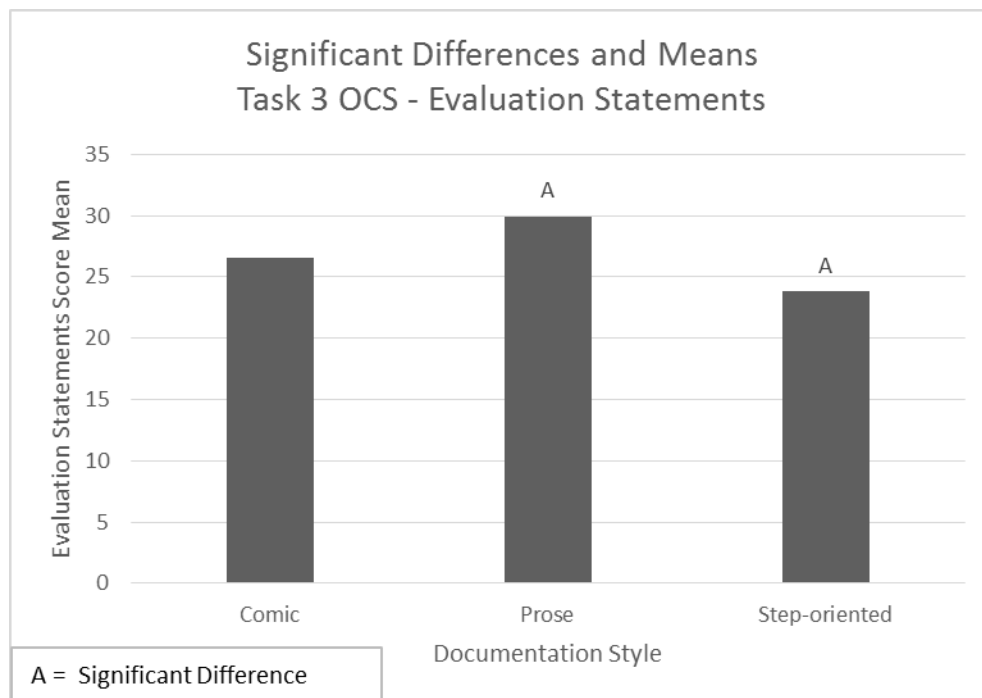


Table 5.56: Descriptive Statistics for Task 3 OCS Evaluation Statements

```
          Df Sum Sq Mean Sq F value    Pr(>F)
Group      2   1329    664.4      5.12 0.00677 **
Residuals 203  26346    129.8
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table 5.57: Tukey Post-Hoc Test for Task 3 OCS Evaluation Statements

```
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = EvaluationStatements ~ Group, data = t3)

$Group
          diff          lwr          upr          p adj
Prose-Comic      3.411067    -1.220050    8.042185 0.1932491
Step-oriented-Comic -2.742638    -7.341756    1.856481 0.3386794
Step-oriented-Prose -6.153705   -10.700713   -1.606697 0.0045973
```

Evaluation Visuals and Examples

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.58. Figure 5.23 shows the means and significant differences found. A significant difference ($p < 0.001$) can be seen in Table 5.59, the one-way ANOVA run on the Visuals and Examples categorization. The Tukey HSD post-hoc test, Table 5.60, shows that the Comic style received significantly better evaluations of the visuals and examples than the Prose style. It also shows that the Step-oriented style received significantly better evaluations of the visuals and examples than the Prose style.

Table 5.58: Task 3 OCS Evaluation Visuals and Examples score average for each of the three groups

```
Group VisualsAndExamples
Comic      10.651515
Prose     14.681159
Step-oriented  9.366197
```

Figure 5.23: Averages for Task 3 OCS Evaluation Visuals and Examples

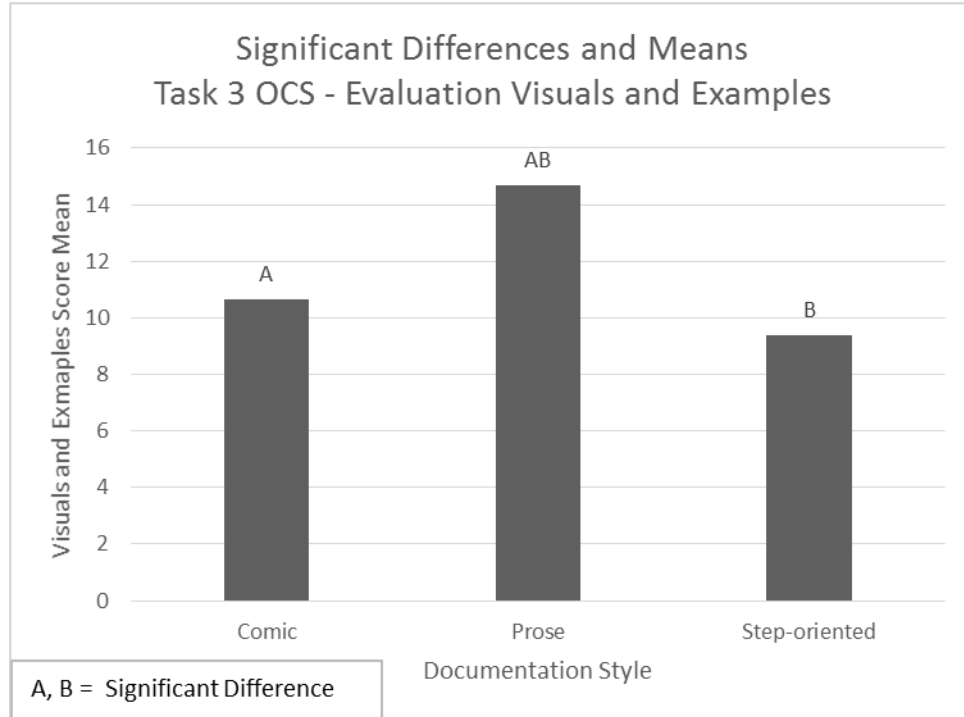


Table 5.59: Descriptive Statistics for Task 3 OCS Evaluation Visuals and Examples

```

      Df Sum Sq Mean Sq F value    Pr(>F)
Group      2   1068    534.2    17.72 8.09e-08 ***
Residuals 203   6120     30.1
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Table 5.60: Tukey Post-Hoc Test for Task 3 OCS Evaluation Visuals and Examples

```

Tukey multiple comparisons of means
 95% family-wise confidence level

Fit: aov(formula = VisualsAndExamples ~ Group, data = t3)

$Group
      diff      lwr      upr    p adj
Prose-Comic      4.029644  1.797531  6.2617575 0.0000915
Step-oriented-Comic -1.285318 -3.502008  0.9313722 0.3591118
Step-oriented-Prose -5.314962 -7.506536 -3.1233882 0.0000001

```

Evaluation Emotional

The means for each group, Comic, Prose, and Step-oriented, are shown in Table 5.61. Figure 5.24 shows the means and significant differences found. Lastly, there was also a significant difference ($p < 0.001$) found for the Emotional categorization, as seen in Table 5.62. The Tukey HSD test, Table 5.63, indicated that again, the Comic and Step-oriented each received significantly better scores in terms of the Emotional evaluation than Prose.

Table 5.61: Task 3 OCS Evaluation Emotional score average for each of the three groups

Group	Emotional
Comic	7.333333
Prose	11.434783
Step-oriented	7.450704

Figure 5.24: Averages for Task 3 OCS Evaluation Emotional

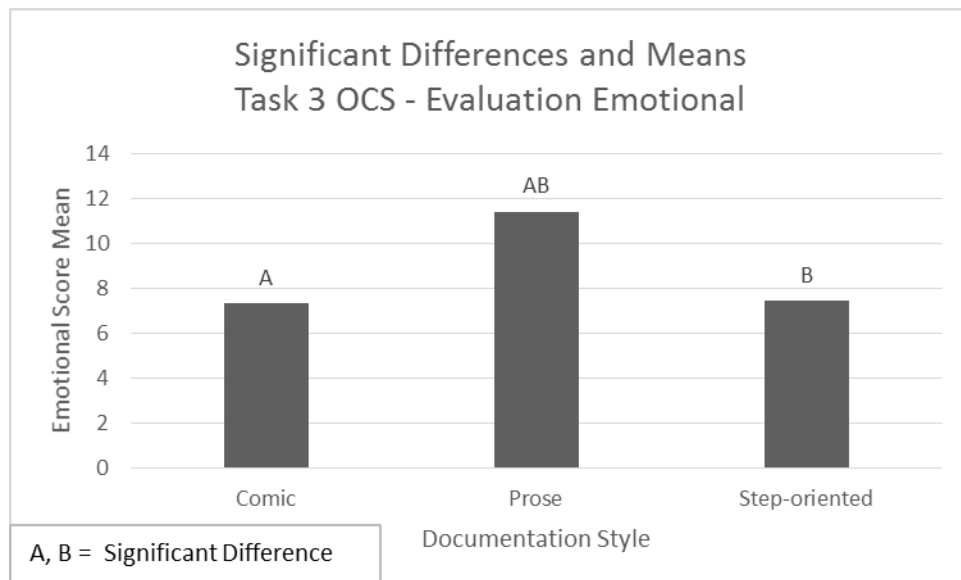


Table 5.62: Descriptive Statistics for Task 3 OCS Evaluation Emotional

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Group	2	750	374.8	19.43	1.91e-08 ***
Residuals	203	3917	19.3		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 5.63: Tukey Post-Hoc Test for Task 3 OCS Evaluation Emotional

```
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = Emotional ~ Group, data = t3)

$Group
```

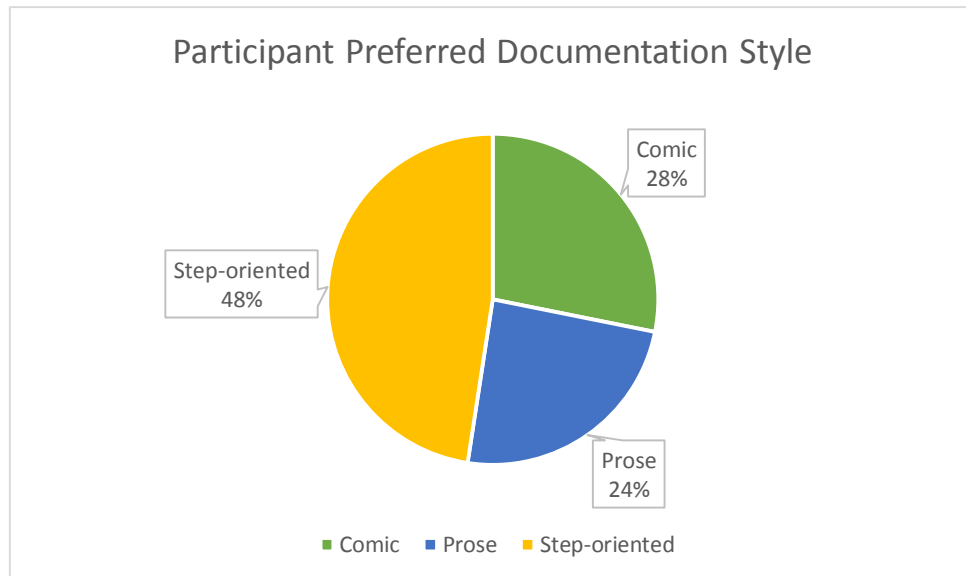
	diff	lwr	upr	p adj
Prose-Comic	4.1014493	2.315733	5.887166	0.0000005
Step-oriented-Comic	0.1173709	-1.656007	1.890749	0.9866290
Step-oriented-Prose	-3.9840784	-5.737363	-2.230794	0.0000007

Post-Task Analysis

The post questionnaire results were analyzed with respect to each participants' overall experiences with the three documentation styles, Prose, Step-oriented, and Comic.

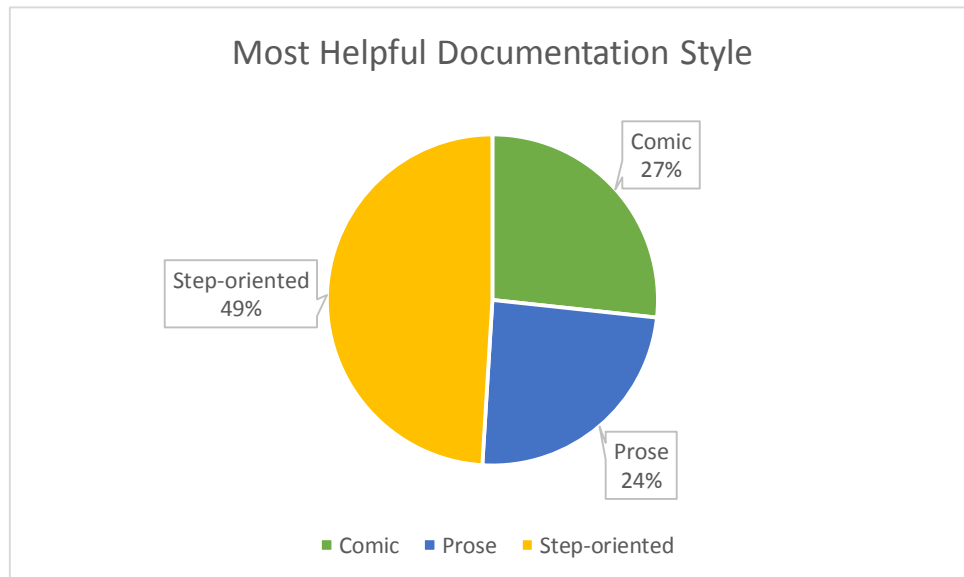
As seen in Figure 5.25, participants overall preferred the Step-oriented style. Of the 206 participants, 98 preferred Step-oriented, 58 preferred Comic, and 50 preferred Prose.

Figure 5.25: Participant Preferred Documentation Style



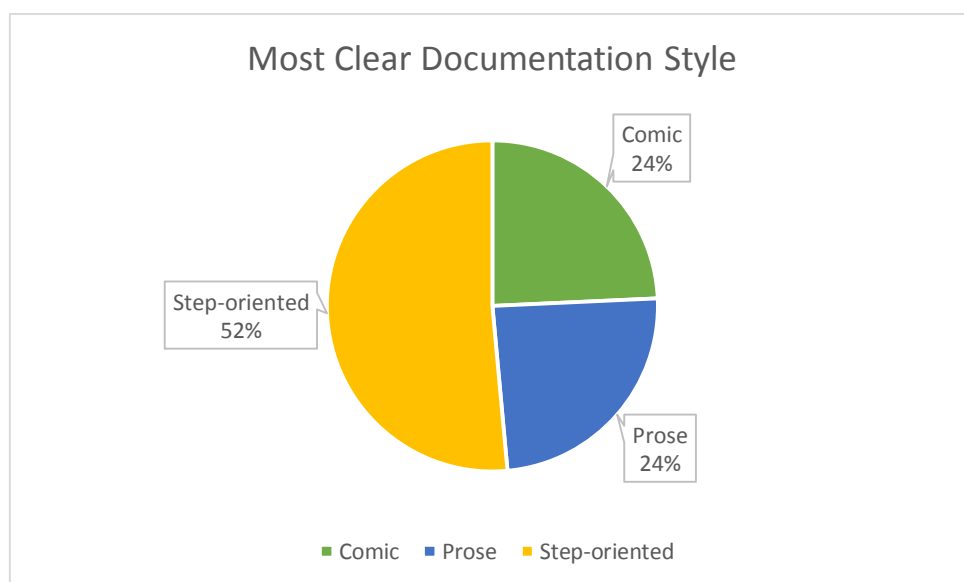
As seen in Figure 5.26, participants overall found the Step-oriented style the most helpful. Of the 206 participants, 101 chose Step-oriented, 55 chose Comic, and 50 chose Prose.

Figure 5.26: Most Helpful Documentation Style



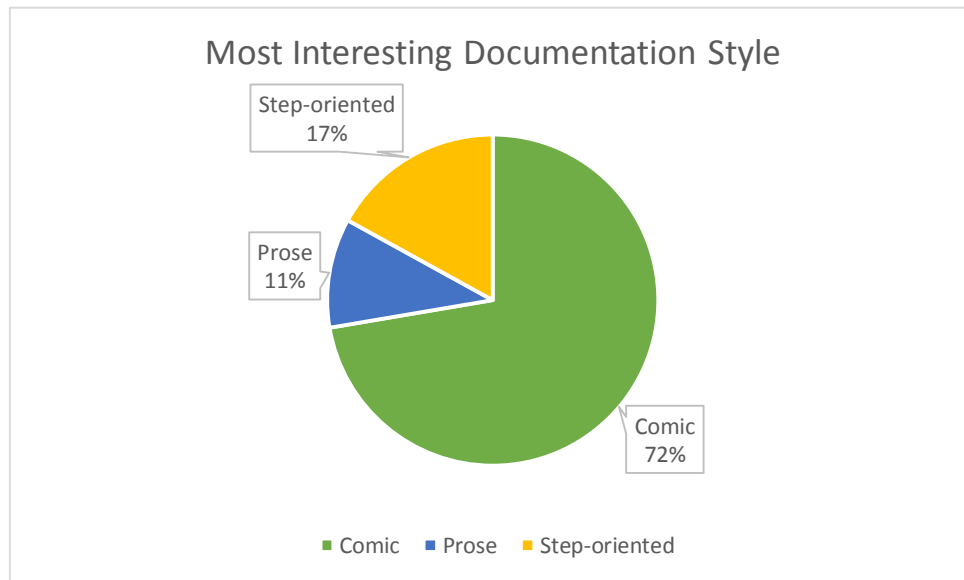
As seen in Figure 5.27, participants overall found the Step-oriented style to be the most clear. Of the 206 participants, 106 chose Step-oriented, 50 chose Comic, and 50 chose Prose.

Figure 5.27: Most Clear Documentation Style



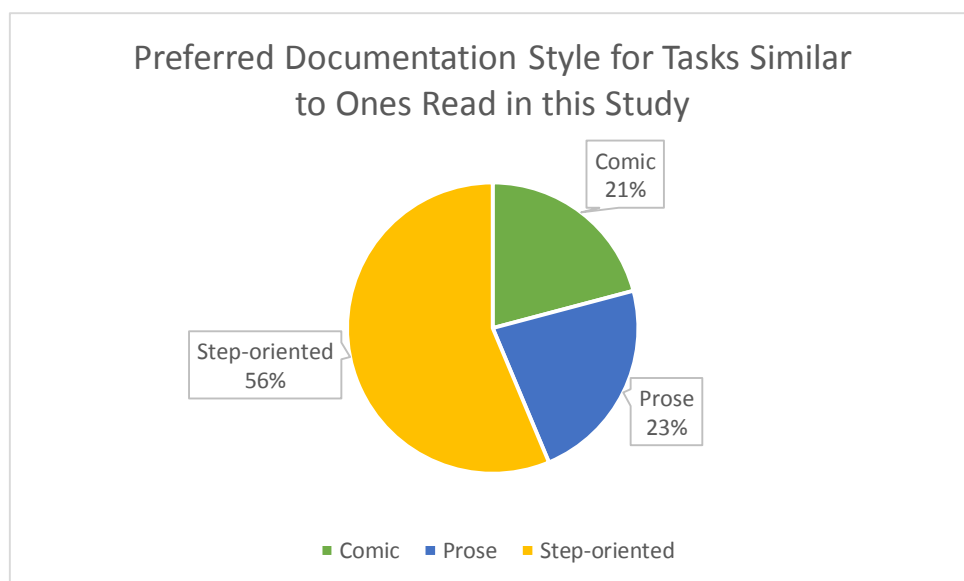
As seen in Figure 5.28, participants overall found the Comic style to be the most interesting. Of the 206 participants, 149 chose Comic, 35 chose Step-oriented, and 22 chose Prose.

Figure 5.28: Most Interesting Documentation Style



As seen in Figure 5.29, participants overall said that they would prefer the Step-oriented style for tasks similar to those used in the study. Of the 206 participants, 116 chose Step-oriented, 47 chose Comic, and 43 chose Prose.

Figure 5.29: Preferred Documentation Style for Similar Tasks



Other Findings

Participant comments revealed insights into participant responses. The findings, rationale, and a selection of associated participant comments are outlined below.

Finding 1: The Comic style could have been improved by having more distinct panel images or other distinguishing features, such as character movement or gestures.

Rationale: Participants found it difficult to go back and find previously read information within the comic.

“The comic about Off Campus Sign In showed the same scene too many times, there was no motion.”

- Participant 129

“The comic style is not good for providing information. It forces you to read the entire document instead of just browsing for the necessary information.”

- Participant 198

“The comic was by far the most interesting to read and the easiest to retain information from, but for a how-to instruction for someone like me who uses it more as a reference than a step by step walk-through, the step-oriented and prose formats are preferred due to titles and headers which makes it easy to skip around and find the information I am looking for, where the comic is harder to find specific information quickly.”

- Participant 370

“The informational comic was more fun and entertaining to read, but didn't format, and organize information as efficiently, and would be tougher to find a quick piece of information from”

- Participant 117

Finding 2: Comics are still perceived as not being a universally acceptable style for documentation.

Rationale: Some participants thought the comics were childish or would be seen as unprofessional.

“I would much rather not have these directions in the form of a comic if it is for college students. It seems rather elementary and you have to scroll a long way to find something simple.”

- Participant 113

“Comic was my favorite. But the step by step is more professional and just as (if not almost) effective”

- Participant 309

Finding 3: Further investigation is needed on how much information and to what complexity level of information can be represented in comic style documentation.

Rationale: Participants thought the comic style would have been difficult to follow given a more complex task.

“Because the information was fairly basic, the comic reading was easy to read and straight to the point. I would not recommend it for any How-To's which are much more complex.”

- Participant 178

Finding 4: The Comic style documentation created positive user experiences.

Rationale: Participants commented on the emotional and entertaining aspects of the comics.

“Plot twists are always fun.”

- Participant 147

“Thank you for letting me spew off my love of comics for a few minutes.”

- Participant 375

“I found that the comic was by far the better documentation.”

- Participant 108

Finding 5: Providing documentation in multiple styles would allow the users to decide which to use. Their preference could change based on whether they are reading the documentation for the first time or going back to find information (see Finding 1).

Rationale: Providing comic style alongside another could address shortcomings of the documentation and still allow users to benefit from its appeal as an interesting style to read.

“Each system had benefits and downsides; making each available for the user to choose would be a good option”

- Participant 358

Chapter 6: Limitations, Discussion, and Summary

Limitations

One limitation, or rather hiccup for the study, was the placement of the “continue to the next task” button. A few participants had to ask where to go to continue after completing the first task and survey. The reason for this was that when the participants use the find within the page, the search box covered up this button, as can be seen in Figure 6.1 that shows the interface without and then with the search functionality being used.

Another limitation was that an incomplete set of data was gathered for 11 participants. This could have been due to the participants needing to go to a different page in their browser so that he or she could complete the study while also being able to reference the task reading for that particular survey. A participant may have continued without completing the survey since there was no validation check in place to prevent the participant from continuing, leaving a survey incomplete or not submitted. Another possible reason for this could be that the survey did not get submitted, or finish submitting before the participant closed the survey tab.

Another limitation of the study was that it was focused on procedural information, specifically how-to instructions. While the study analysis was still informative for this type of documentation, an investigation of conceptual information documentation would expand the knowledge gathered.

Figure 6.1: Study interface before and after search



Discussion and New Hypothesis

In summary of how the styles compare, RQ2, the Comic style was neither the best nor the worst when considering understanding, as the Step-oriented was the best and the Prose the worst. In terms of evaluation as a whole, the Comic style and the Step-oriented style were the best, while Prose was again the worst. Subjectively, Comic was the best style, taking into consideration the emotional categorization, the ratings for the most interesting style, and the additional comments provided by the participants.

Notably, the findings and observations from the study contribute rationale for suggestions on how to improve the Comic style to better suit how-to documentation tasks. Based on the findings from the study, I have developed a new research question.

Future question of study: *Can we improve the design of the comics enough as to change the results of RQ2?*

A potential change to the Comic style based on Finding 1 is to make the panels more distinct and topics more recognizable within the documentation. One way this could be done would be through creating a series of shorter comic strips on a particular small section of the documentation, clearly labeling it by the information it gives. This does not mean that the narrative of the Comic would need to be broken, as it can continue from strip to strip, but the reader could jump around as needed to find what he or she is looking for, or have a better basis to go back and find a particular topic. Further strengthening of the Comic style would be to better convey character action, including scene changes, character movement, and character gestures. Given the results and observations from the study, a future possibility is that comics could be improved through creating more concise, sub-sectioned comic strips that have clear and distinct character action, scene changes, and content presentation, whereas improvement could be measured through an investigation of how such generated comics compare to other documentation styles (RQ2).

When looking back at Finding 5, there is potential for Comics as documentation to be used as auxiliary styles. For instance, if a reader needs to look at documentation and is in the mood for reading a comic rather than styles such as the Step-oriented or Prose, then he or she can do so. Whereas if the user would rather go to a more traditional style, he or she may opt for the alternative style. This would further draw in not only user preference at a particular state and time, but would also provide the Comic as an alternative style to those who need it for reasons beyond preference. This can include a user who needs Comics for reasons including but not limited to literacy, language fluency, or visual learning.

Considering that the Prose style is representative of the original, current Virginia Tech library documentation, suggestions for improvement can be drawn from the results of this research. The results indicate that Prose was the overall worst documentation style of the three styles compared across the different categories including the understanding and evaluation categories. As such, the library may want to consider changing their documentation style for these how to tasks to either a step-oriented or comic style.

Summary

Revisiting RQ1 the TechCommix tool as a proof of concept, demonstrated that comics can be automatically generated and in a responsive way. The comics created for the study demonstrated the flexibility of content. Given how the comics are authored, consumption format will not be an issue, either.

For RQ2, the generated comics did comparatively well in terms of understanding in all but the Task 1 RB overall understanding and performance understanding categorizations, where Step-oriented had significantly better understanding scores than Prose, leaving the Comic style as being neither the best nor the worst. Furthermore, the comics generated for the study were successful as a proof of concept, being both clear and appropriate for a comparison documentation style.

In consideration of the evaluation scores in terms of overall, element, and statement categories, while Comic was never significantly better, it was never worse, unlike the Prose style. For the visuals and examples, Comic was significantly better, alongside Step-oriented, than the Prose style across all three tasks. Similarly, for the emotional evaluation categorization, Comic was again evaluated as significantly better, alongside Step-oriented, than the Prose style across all three tasks. However, when it came to participant comments, there were no given additional comments relating any positive experience or emotional impact of the Step-oriented style, even though more participants chose it as their preferred style. One participant commented on his or her negative user experience with the Prose style, saying that it was boring. The Comic style produced positive experiences and emotional impacts based on the comments dealing with how interesting and entertaining it was. Furthermore, for the most part participants were able to give accurate answers, displaying the overall effective use of the Comic style as documentation. Both of these previous statements point to the finding that comics are not necessarily better as documentation than other styles, but they can provide better user experiences.

Chapter 7: Looking Forward

Open questions and projects for future study include the development of an online tool, freely accessible, for the creation of technical comics. The tool would showcase a design informed by research regarding user needs when creating online technical comics. This leads into determining the factors that influence authorship of comics for technical documentation. The overarching concept would be a place for the everyday person to be able to transform technical information, concepts, and ideas into their own technical comics that can be easily shared and stored. Supported export options could include HTML, PDF, and image file formats, depending on the nature of use and distribution of the comics. Development could also include an online repository of panel images to be utilized when creating a technical comic. The idea is that given the creation of comics is structured authoring, the tool would only require the user to input the textual content and any optional images, outside of the image repository, for use as panels. The user would further specify the use of the inputted text based on a comic character, for use as speech or thought bubbles, or narration tags.

The aims and phases associated with the TechCommix project are founded on and shaped by the intellectual merits of technical communication research that are outlined below. Such aims could carry over to new studies or projects dealing with the subject matter of comics as documentation.

1. Identification of and reflection on current benefits, shortcomings, and trends of change in terms of technical communication content and formats associated with current and past standards and procedures for the authoring and sharing of technical information and communications
2. Investigation and creation of impacts associated with the application of non-traditional formats for creating and distributing technical content and documentation
3. Investigation of the utilization of differing formats for technical communication in various applications to gain further insight and understanding of aspects related to user comprehension, retention, and transfer of technical information and documentation

Impact

Reflecting on the potential impact of automatically generated technical comics, research in the scope of technical communication and documentation has the potential to break down barriers between traditional and non-traditional formatting structures, small scale changes and large scale impacts, and informal human communication and formalized informational communication approaches.

1. Cross-community and interdisciplinary viewpoints and applications of technical comics and the interplay between technical comics and other forms of technical communication and documentation
2. Resulting, “tangible” products will be the TechCommix comic authorship tool and any comics created as a result of the tool
3. Resulting intellectual products will be insights, observations, and significant findings associated with technical communications, specifically the use of technical comics and their integration with other formats for the display of technical documentation
4. Resulting educational and knowledge sharing workshops, events, and discussion for furthering awareness and application of technical comics and associated research findings

The TechCommix project can, as discovered through the research presented here, continue to take a traditional approach on a nontraditional topic in the pursuit of small changes for big impact relations, rethinking and restructuring technical communication for the individual and the collective communities.

References

- [1] S. McCloud, *Understanding Comics*. HarperCollins, 1994, p. 224.
- [2] “Welcome to PS Magazine!” [Online]. Available: <https://www.logsa.army.mil/psmag/pshome.cfm>. [Accessed: 26-Apr-2014].
- [3] G. C. team with comics adaptation by S. McCloud, *Google Chrome*. Google, Inc., 2008.
- [4] M. J. Green, “Teaching with Comics: A Course for Fourth-Year Medical Students.,” *J. Med. Humanit.*, Sep. 2013.
- [5] M. Haesen, J. Meskens, K. Luyten, and K. Coninx, “Draw me a storyboard: incorporating principles & techniques of comics...,” pp. 133–142, Sep. 2010.
- [6] B. Chen, R. Jablonsky, J. B. Margines, R. Gupta, and S. Thakkar, “Comic circuit,” in *CHI '13 Extended Abstracts on Human Factors in Computing Systems on - CHI EA '13*, 2013, p. 2561.
- [7] I. Cervesato, “Discovering logic through comics,” in *Proceedings of the 16th annual joint conference on Innovation and technology in computer science education - ITiCSE '11*, 2011, p. 103.
- [8] G. Davison, S. Murphy, and R. Wong, “The use of eBooks and interactive multimedia as alternative forms of technical documentation,” in *Proceedings of the 23rd annual international conference on Design of communication documenting & designing for pervasive information - SIGDOC '05*, 2005, p. 108.
- [9] P.-Y. Chi, S. Ahn, A. Ren, M. Dontcheva, W. Li, and B. Hartmann, “MixT,” in *Proceedings of the 25th annual ACM symposium on User interface software and technology - UIST '12*, 2012, p. 93.
- [10] D. Rowland, B. Walker, A. Chamberlain, S. Rennick Egglestone, J. Marshall, H. Schnädelbach, S. Benford, D. Porter, M. Gibson, K. Walker, J. Underwood, R. Luckin, H. Smith, G. Fitzpatrick, and J. Good, “Sequential art for science and CHI,” in *Proceedings of the 28th of the international conference extended abstracts on Human factors in computing systems - CHI EA '10*, 2010, p. 2651.
- [11] E. Haughney, “Using comics to communicate qualitative user research findings,” in *Proceeding of the twenty-sixth annual CHI conference extended abstracts on Human factors in computing systems - CHI '08*, 2008, p. 2209.
- [12] S. McCloud, *Reinventing Comics: How Imagination and Technology Are Revolutionizing an Art Form*. HarperCollins, 2000, p. 256.

- [13] S. McCloud, *Making Comics (Google eBook)*. HarperCollins, 2011, p. 272.
- [14] “See What I Mean: How to Use Comics to Communicate Ideas: Kevin Cheng: 9781933820279: Amazon.com: Books.” [Online]. Available: <http://www.amazon.com/See-What-Mean-Comics-Communicate/dp/1933820276>. [Accessed: 09-May-2014].
- [15] C. Evia, M. Stewart, T. Lockridge, S. Scerbo, and M. Perez-Quiñones, “Structured authoring meets technical comics in techcommix,” in *Proceedings of the 30th ACM international conference on Design of communication - SIGDOC '12*, 2012, p. 353.
- [16] M. Priestley, “DITA XML,” in *Proceedings of the 19th annual international conference on Computer documentation - SIGDOC '01*, 2001, p. 152.
- [17] L. Bellamy, M. Carey, and J. Schlotfeldt, *DITA Best Practices: A Roadmap for Writing, Editing, and Architecting in DITA*. IBM Press, 2011, p. 281.
- [18] S. Murphy, “Accessibility of graphics in technical documentation for the cognitive and visually impaired,” in *Proceedings of the 23rd annual international conference on Design of communication documenting & designing for pervasive information - SIGDOC '05*, 2005, p. 12.
- [19] G. Hargis, “Readability and computer documentation,” *ACM J. Comput. Doc.*, vol. 24, no. 3, pp. 122–131, Aug. 2000.
- [20] A. M. Aladwani and P. C. Palvia, “Developing and validating an instrument for measuring user-perceived web quality,” *Inf. Manag.*, vol. 39, no. 6, pp. 467–476, May 2002.
- [21] M. A. Pérez-Quiñones, “Template-System-in-PHP,” *GitHub*. [Online]. Available: <https://github.com/mapq/Template-System-in-PHP>. [Accessed: 18-Nov-2013].
- [22] “jmac.org.” [Online]. Available: <http://comicsml.jmac.org/about.html>. [Accessed: 27-Apr-2014].
- [23] M. Hardee, C. Cameron, K. Cheng, Sun Microsystems, and Cisco, “Design Comics :: Characters and Scenes for Storyboarding & Design.” [Online]. Available: <http://www.designcomics.org/>. [Accessed: 27-Apr-2014].
- [24] “Bootstrap.” [Online]. Available: <http://getbootstrap.com/>. [Accessed: 09-May-2014].
- [25] “Qualtrics Survey Software.” [Online]. Available: <https://viriniatech.qualtrics.com/>. [Accessed: 26-Apr-2014].
- [26] “University Libraries | Virginia Tech.” [Online]. Available: <http://www.lib.vt.edu/index.html>. [Accessed: 03-May-2014].

- [27] “How to request a book | University Libraries | Virginia Tech.” [Online]. Available: <http://www.lib.vt.edu/help/request-book.html>. [Accessed: 03-May-2014].
- [28] “Summon help | University Libraries | Virginia Tech.” [Online]. Available: <http://www.lib.vt.edu/help/summon/>. [Accessed: 03-May-2014].
- [29] “What is Summon? | University Libraries | Virginia Tech.” [Online]. Available: <http://www.lib.vt.edu/help/summon/what-is-summon.html>. [Accessed: 03-May-2014].
- [30] “About Off Campus Sign In | University Libraries | Virginia Tech.” [Online]. Available: <http://www.lib.vt.edu/help/extended/extproxy.html>. [Accessed: 03-May-2014].
- [31] “OASIS Darwin Information Typing Architecture (DITA) TC | OASIS.” [Online]. Available: https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=dita. [Accessed: 03-May-2014].
- [32] G. Hargis, M. Carey, A. K. Hernandez, P. Hughes, D. Longo, S. Rouiller, and E. Wilde, “Developing Quality Technical Information: A Handbook for Writers and Editors (2nd Edition),” Apr. 2004.

Appendix A - Code

Full HTML template file code that defines the 14 panel types –
“template.html”

```

<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8"/>
    <meta name="viewport" content="width=device-width, initial-scale=1.0"/>
    <meta name="description" content=""/>
    <meta name="author" content=""/>

    <title>Comic Strip: {title}</title>

    <!-- Obtain Bootstrap style sheet from CDN (online service) so it doesn't have to be on
my machine -->
    <link href="http://netdna.bootstrapcdn.com/bootstrap/3.0.0/css/bootstrap.min.css" rel=
"stylesheet"/>

    <style>
      .main {
        background-color:#eeeeee;
        font-family:'Comic Sans MS',cursive;
        font-size: 18px;
        @media(min-width: @screen-desktop) {
          font-size: 12px
        }
      }

      .narrationTop {
        top: 0%;
        left: 0;
        width: 100%;
        height: 30%;
        padding: 2px;
        position: relative;
        background-color: white;
        opacity: 25;
        border:1px solid;
        border-radius:0px;
      }

      .narrationBottom {
        top: 100%;
        left: 0;
        width: 100%;
        height: 30%;
        padding: 2px;
        position: relative;
        background-color: white;
        opacity: 100;
        border:1px solid;
        border-radius:0px;
      }

      .bubbleLeft {
        top:5%;
        left: 38%;

```

```
width: 58%;
height: 42%;
padding: 15px;
position: absolute;
opacity: 0.75;
border:0.5px solid;
border-radius:15px;
background-image:url('bubbleLeft.png');
background-size: 100% 100%;
background-repeat:no-repeat;
}

.bubbleTwoLeft {
top:5%;
left: 25%;
width: 64%;
height: 20%;
padding: 6px;
position: absolute;
opacity: 0.75;
border:0.5px solid;
border-radius:15px;
background-image:url('bubbleLeft.png');
background-size: 100% 100%;
background-repeat:no-repeat;
}

.bubbleTwoLeftDown {
top: 22%;
left: 31%;
width: 38%;
height: 20%;
padding: 6px;
position: absolute;
opacity: 0.75;
border:0.5px solid;
border-radius:15px;
background-image:url('bubbleLeft.png');
background-size: 100% 100%;
background-repeat:no-repeat;
}

.bubbleTwoLeftFurtherDown {
top:45%;
left: 32%;
width: 30%;
height: 50%;
padding: 6px;
padding-top: 50px;
position: absolute;
opacity: 0.75;
border:0.5px solid;
border-radius:15px;
```

```
        background-image:url('bubbleLeftSmall13.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
    }

    .bubbleSmallLeft {
        top: 5%;
        left: 29%;
        width: 32%;
        height: 40%;
        padding: 15px;
        position: absolute;
        opacity: 0.75;
        border:0.5px solid;
        border-radius:15px;
        background-image:url('bubbleLeft.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
    }

    .bubbleRight {
        top:5%;
        left: 38%;
        width: 58%;
        height: 42%;
        padding: 15px;
        position: absolute;
        opacity: 0.75;
        border:0.5px solid;
        border-radius:15px;
        background-image:url('bubbleRight.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
    }

    .bubbleTwoRight {
        top:4%;
        left: 33%;
        width: 64%;
        height: 20%;
        padding: 6px;
        position: absolute;
        opacity: 0.75;
        border:0.5px solid;
        border-radius:15px;
        background-image:url('bubbleRightSmall.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
    }

    .bubbleTwoRightDown {
        top:24%;
        left: 36%;
        width: 60%;
```

```
    height: 22%;
    padding: 6px;
    position: absolute;
    opacity: 0.75;
    border: 0.5px solid;
    border-radius: 15px;
    background-image: url('bubbleRight.png');
    background-size: 100% 100%;
    background-repeat: no-repeat;
}

.bubbleTwoRightFurtherDown {
    top: 45%;
    left: 35%;
    width: 30%;
    height: 50%;
    padding: 6px;
    padding-right: 34px;
    position: absolute;
    opacity: 0.75;
    border: 0.5px solid;
    border-radius: 15px;
    background-image: url('bubbleRightSmall2.png');
    background-size: 100% 100%;
    background-repeat: no-repeat;
}

.bubbleSmallRight {
    top: 5%;
    left: 62%;
    width: 35%;
    height: 40%;
    padding: 15px;
    position: absolute;
    opacity: 0.75;
    border: 0.5px solid;
    border-radius: 15px;
    background-image: url('bubbleRightSmall.png');
    background-size: 100% 100%;
    background-repeat: no-repeat;
}

.thoughtBubbleLeft {
    top: 4%;
    left: 28%;
    width: 54%;
    height: 40%;
    padding-top: 35px;
    padding-bottom: 10px;
    padding-left: 44px;
    padding-right: 10px;
    position: absolute;
    opacity: 0.75;
    background-image: url('cloud.png');
```



```
        background-size: 100% 100%;
        background-repeat:no-repeat;
        border-image-width:auto;
    }

    .thoughtBubbleRight {
        top:4%;
        left: 42%;
        width: 54%;
        height: 40%;
        padding-top: 35px;
        padding-bottom: 10px;
        padding-left: 44px;
        padding-right: 10px;
        position: absolute;
        opacity: 0.75;
        background-image:url('cloud.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
        border-image-width:auto;
    }

    .thoughtBubbleTwoLeft {
        top:3%;
        left: 22%;
        width: 46%;
        height: 23%;
        padding-top: 10px;
        padding-bottom: 10px;
        padding-left: 42px;
        padding-right: 20px;
        position: absolute;
        opacity: 0.75;
        background-image:url('cloud.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
        border-image-width:auto;
    }

    .thoughtBubbleTwoRight {
        top:20%;
        left: 52%;
        width: 46%;
        height: 23%;
        padding-top: 10px;
        padding-bottom: 10px;
        padding-left: 42px;
        padding-right: 20px;
        position: absolute;
        opacity: 0.75;
        background-image:url('cloud.png');
        background-size: 100% 100%;
        background-repeat:no-repeat;
        border-image-width:auto;
```

```

    }

    .font {
        color: black;
    }

    .shadow {
        box-shadow: 10px 10px 30px black;
    }

    #permalink_section
    {
        white-space: -moz-pre-wrap; /* Mozilla, since 1999 */
        white-space: -pre-wrap; /* Opera 4-6 */
        white-space: -o-pre-wrap; /* Opera 7 */
        word-wrap: break-word; /* Internet Explorer 5.5+ */
    }

    .floatBottom {
        top: 90%;
        left: 1%;
        width: 98%;
        padding: 10px;
        position: absolute;
        background-color: white;
        opacity: 100;
        border-radius:0px;
        opacity: 0.75;
        font-size:12pt;
    }
</style>

<!-- HTML5 shim and Respond.js IE8 support of HTML5 elements and media queries -->
<!--[if lt IE 9]>
<script src="../../assets/js/html5shiv.js"></script>
<script src="../../assets/js/respond.min.js"></script>
<![endif]-->
</head>

<!--<body style="background-color:#eeeeee; font-family:'Comic Sans MS',cursive;"-->
<body class="main">

<div class="container">
<h1 style="font-family:Showcard Gothic">{title}</h1>
<p class="lead">{description}</p>
<div class="row">
    <% repeat {panel} %>
        <div class="col-lg-6 col-md-6 col-sm-12 col-xs-12 well well-sm shadow">
            <% if {type1} %> <!-- Type 1 -->
                <div class="narrationTop">
                    <p class="font">{text1}</p>
                </div>
                <% include image.html %>
            <% else %> <!-- Type 2 -->

```

```

<% if {type2} %>
  <% include image.html %>
  <div class="narrationBottom">
    <p class="font">{text1}</p>
  </div>
<% else %> <!-- Type 3 -->
  <% if {type3} %>
    <% include image.html %>
    <%if {left} %>
      <div class="bubbleLeft">
        <p class="font">{text1}</p>
      </div>
    <% else %>
      <%if {right} %>
        <div class="bubbleRight">
          <p class="font">{text1}</p>
        </div>
      <% end %><!-- end right -->
    <% end %><!-- end left -->
  <% else %> <!-- Type 4 -->

    <% if {type4} %>
      <% include image.html %>
      <div class="bubbleSmallRight">
        <p class="font">{text1}</p>
      </div>
      <div class="bubbleSmallLeft">
        <p class="font">{text2}</p>
      </div>

    <% else %> <!-- Type 5 -->

      <% if {type5} %>
        <% include image.html %>
        <div class="bubbleTwoLeft">
          <p class="font">{text1}</p>
        </div>
        <div class="bubbleTwoRightDown">
          <p class="font">{text2}</p>
        </div>

      <% else %> <!-- Type 6 -->
        <% if {type6} %>
          <% include image.html %>
          <div class="bubbleTwoRight">
            <p class="font">{text1}</p>
          </div>
          <div class="bubbleTwoLeftDown">
            <p class="font">{text2}</p>
          </div>
        <% else %> <!-- Type 7 -->

          82
          <% if {type7} %>

```

```

    <% include image.html %>
<% else %> <!-- Type 8 -->

    <% if {type8} %>
        <p class="font">{text1}</p>
    <% else %> <!-- Type 9 -->

        <% if {type9} %>
            <% include image.html %>
            <%if {left} %>
                <div class="thoughtBubbleLeft">

                    <p class="font">{text1}</p>
                </div>
            <% else %>
                <%if {right} %>
                    <div class="thoughtBubbleRight">

                        <p class="font">{text1}</p>
                    </div>
                <% end %><!-- end right -->
            <% end %><!-- end left -->
        <% else %> <!-- Type 10 -->

            <% if {type10} %>
                <% include image.html %>
                <div class="thoughtBubbleTwoLeft">

                    <p class="font">{text1}</p>

                </div>
                <div class="thoughtBubbleTwoRight">
                    <p class="font">{text2}</p>
                </div>
            <% else %> <!-- Type 11 -->

                <% if {type11} %>
                    <% include image.html %>
                    <div class="bubbleTwoLeft">
                        <p class="font">{text1}</p>
                    </div>
                    <div class="thoughtBubbleTwoRight">

                        <p class="font">{text2}</p>

                    </div>
                <% else %> <!-- Type 12 -->

                    <% if {type12} %>
                        <% include image.html %>
                        <div class="
"thoughtBubbleTwoLeft">

```

```

</div>
<div class="bubbleTwoRightDown">

    <p class="font">{text2}</p>

</div>

<% else %> <!-- Type 13 -->

    <% if {type13} %>
        <% include image.html %>
        <div id="permalink_section"

            <a href="{text2}" target

class="floatBottom">

="_blank">{text2}</a>

            </div>
            <%if {left} %>
                <div class="bubbleLeft">
                    <p class="font">
                        {text1}
                        <a href=

"{text2}" target="_blank">{text3}</a>

                    </p>
                </div>
            <% else %>
                <%if {right} %>
                    <div class=

                        <p class="font">
                            {text1}
                            <a href=

"{text2}" target="_blank">{text3}</a>

                        </p>
                    </div>
                <% end %><!-- end right

-->

            <% end %><!-- end left -->

    <% else %> <!-- Type 14 -->
        <% if {type14} %>
            <% include image.html %>
            <%if {left} %>
                <div class=

                    <p class="font">

                        {text1}</p>

                </div>
                <div class=

                    <p class="font">

                        {text2}</p>

                </div>
            </div>

```

```

        <% else %>
            <%if {right} %>

                <div class=

"bubbleRight">

                    <p class=

"font">{text1}</p>

                </div>
                <div class=

"bubbleTwoRightFurtherDown">

                    <p class=

"font">{text2}</p>

                </div>
            <% end %><!-- end

right -->

-->

        <% end %><!-- end left

        <% end %><!-- TYPE 14-->
        <% end %><!-- TYPE 13-->
        <% end %><!-- TYPE 12-->
        <% end %><!-- TYPE 11-->
        <% end %><!-- TYPE 10-->
        <% end %><!-- TYPE 9-->
        <% end %><!-- TYPE 8-->
        <% end %><!-- TYPE 7-->
        <% end %><!-- TYPE 6-->
        <% end %><!-- TYPE 5-->
        <% end %><!-- TYPE 4-->
        <% end %><!-- TYPE 3-->
        <% end %><!-- TYPE 2-->
        <% end %><!-- TYPE 1-->
    </div><!--/col-lg-3 col-md-3 col-sm-6 col-xs-12 well well-sm-->

    <% if {newrow} %>
    </div>
    <div class="row"><!-- THIS IS CRAZY!-->
        <% end %>
    <% end %><!-- END REPEAT panel -->
</div><!--/row-->
<hr>

<footer>
    <p>&copy; TechCommix</p>
</footer>

</div><!--/.container-->
<!-- Obtain latest version of jquery automatically -->
<script src="http://code.jquery.com/jquery-latest.js"></script>
<!-- Obtain Bootstrap javascript from CDN (online service) so it doesn't have to be on my
machine -->
<script src="//netdna.bootstrapcdn.com/bootstrap/3.0.0/js/bootstrap.min.js"></script>
</body>
</html>

```

Full XML data file for 14 Panel Types comic –
“data_types.xml”

```

<xml>

<title>The 14 Panel Types</title>
<description>Displayed and Explained</description>
<prolog>
<people>
  <person>
    <firstname>Rebecca</firstname>
    <surname>Zeitz</surname>
    <email>razeitz@vt.edu</email>
    <url>http://www.vt.edu</url>
    <role>Writer</role>
  </person>
  <person>
    <firstname>Carlos</firstname>
    <surname>Evia</surname>
    <email>cevia@vt.edu</email>
    <url>http://www.vt.edu</url>
    <role>Writer</role>
  </person>
  <person>
    <firstname>Manuel</firstname>
    <surname>Perez-Quinones</surname>
    <email>perez@cs.vt.edu</email>
    <url>http://www.vt.edu</url>
    <role>Writer</role>
  </person>
  <person>
    <firstname>Rebecka</firstname>
    <surname>Huey</surname>
    <email>bk1025@vt.edu</email>
    <url>http://www.vt.edu</url>
    <role>Writer</role>
  </person>
</people>
<last-built>2014-02-25</last-built>
<attribution>Based on illustrations and concepts from Sun Microsystems, Inc.</attribution>
</prolog>

<strip id="pos_view_online_status">
  <characters>
    <character id="1">
      <name>AnaLi</name>
      <gender>Female</gender>
    </character>
    <character id="2">
      <name>Pravin</name>
      <gender>Male</gender>
    </character>
  </characters>
</strip>

<panel>

```



```

    <action>We see a close up of AnaLi.</action>
    <text1 characterid="1" type="step">Hello! This is a demonstration of the different
panel types and what elements each panel type contains. Let's get started.</text1>
    <image>panels/pp122.png</image>
    <left>left</left>
    <type3>type</type3>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <text1 characterid="1" type="plot">This is Type 1. This is where narration goes when
it needs to be at the top of the panel image. Looks like someone's not too happy.</text1>
    <image>panels/pp111.png</image>
    <type1>type</type1>
    <newrow>row</newrow>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <text1 characterid="2" type="plot">Here is Type 2. It also contains narration, but at
the bottom of the panel image.</text1>
    <image>panels/pp124.png</image>
    <type2>type</type2>
</panel>

<panel>
    <action>We see a close up of AnaLi.</action>
    <text1 characterid="1" type="plot">Type 3 with the left modifier element contains one
speech bubble to show that the character on the left is talking. That's me!</text1>
    <image>panels/pp125.png</image>
    <left>left</left>
    <type3>type</type3>
    <newrow>row</newrow>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <text1 characterid="1" type="plot">Hey, when did I get in this? This is Type 3 with
the right modifier element, like the previous one except the character on the right is talking.
</text1>
    <image>panels/pp112.png</image>
    <right>left</right>
    <type3>type</type3>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <text1 characterid="2" type="plot">Type 4 is for the two characters talking
simultaneously. Jinx! Jinx again!</text1>
    <text2>Type 4 is for the two characters talking simultaneously. Jinx! Jinx again!

```

```
</text2>
    <image>panels/pp113.png</image>
    <type4>type</type4>
    <newrow>row</newrow>
</panel>

<panel>
    <action>We see a close up of AnaLi.</action>
    <text1 characterid="2" type="plot">In type 5, I get to talk first since I'm on the left.
</text1>
    <text2>You can't see me, but I'm over here! I still get the next word in for Type 5.
</text2>
    <image>panels/pp123.png</image>
    <type5>type</type5>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <text1 characterid="2" type="plot">And for Type 6 I get to go first.</text1>
    <text2 characterid="1" type="plot">And then me, saving the best for last.</text2>
    <image>panels/pp113.png</image>
    <type6>type</type6>
    <newrow>row</newrow>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <image>panels/pp124.png</image>
    <type7>type</type7>
</panel>

<panel>
    <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
    <text1 characterid="1" type="step">The previous panel was Type 7, which only shows an
image. Hence, why I am telling you about it here, in this Type 8 panel. This panel contains
nothing but text. If I had more to say here, I could fill it all!
</text1>
    <type8>type</type8>
    <newrow>row</newrow>
</panel>
```

```

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="step">With Type 9 and the left modifier element you can
see my thoughts!</text1>
  <image>panels/pp114.png</image>
  <left>left</left>
  <type9>type</type9>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="step">With the Type 9 right modifier, I can make a weird
face for no reason. She'll have no clue what I'm thinking.</text1>
  <image>panels/pp124.png</image>
  <right>right</right>
  <type9>type</type9>
  <newrow>row</newrow>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="step">Type 10 shows both of our thoughts.</text1>
  <text2 characterid="2" type="step">...yeah, whatever she thought.</text2>
  <image>panels/pp113.png</image>
  <type10>type</type10>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="step">With Type 11 you can hear what I say and see what he
is thinking.</text1>
  <text2 characterid="1" type="step">Ha. You can't hear text in a comic unless you read
it out loud.</text2>
  <image>panels/pp114.png</image>
  <type11>type</type11>
  <newrow>row</newrow>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="step">He better get this right. It's just the opposite of
Type 11.</text1>
  <text2 characterid="1" type="step">Type 12 shows you what I am saying and what she's
thinking.</text2>
  <image>panels/pp112.png</image>
  <type12>type</type12>
</panel>

```

```

<panel>
  <action>We see a close up of AnaLi.</action>
  <text1 characterid="1" type="step">This is Type 13, where I can give you this link
</text1>
  <text2 characterid="1" type="step">...and display it here: http://www.lib.vt.edu/
</text2>
  <text3 characterid="1" type="step">here...</text3>
  <image>panels/pp122.png</image>
  <left>left</left>
  <type13>type</type13>
  <newrow>row</newrow>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="step">Yeah, and with the right modifier element I can now
give you one, too. Four letters: </text1>
  <text2 characterid="1" type="step">http://xkcd.com</text2>
  <text3 characterid="1" type="step">xkcd.</text3>
  <image>panels/pp113.png</image>
  <right>right</right>
  <type13>type</type13>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="2" type="plot">I talk first again with the left modifier element
and Type 14. However, I only need this panel type if I have a lot to say and...</text1>
  <text2>...if what I have to say needs to go inside the same panel.</text2>
  <image>panels/pp114.png</image>
  <left>left</left>
  <type14>type</type14>
  <newrow>row</newrow>
</panel>

<panel>
  <action>We see two characters, Pravin and AnaLi. Pravin is sitting at his computer.
</action>
  <text1 characterid="1" type="plot">I really don't need both of these speech bubbles,
but I am required to show you what Type 14 looks like with the right modifier element.</text1>
  <text2>You can pretend I am saying something important here.</text2>
  <image>panels/pp112.png</image>
  <right>right</right>
  <type14>type</type14>
</panel>

<panel>
  <action>We see a close up of AnaLi.</action>
  <text1 characterid="1" type="step">What are you still reading this for? Panel Type 14
was the last one.</text1>
  <image>panels/pp122.png</image>
  <left>left</left>

```

```
<type3>type</type3>
</panel>

</xml>
```

Appendix B - Comics

Comics

THE 14 PANEL TYPES

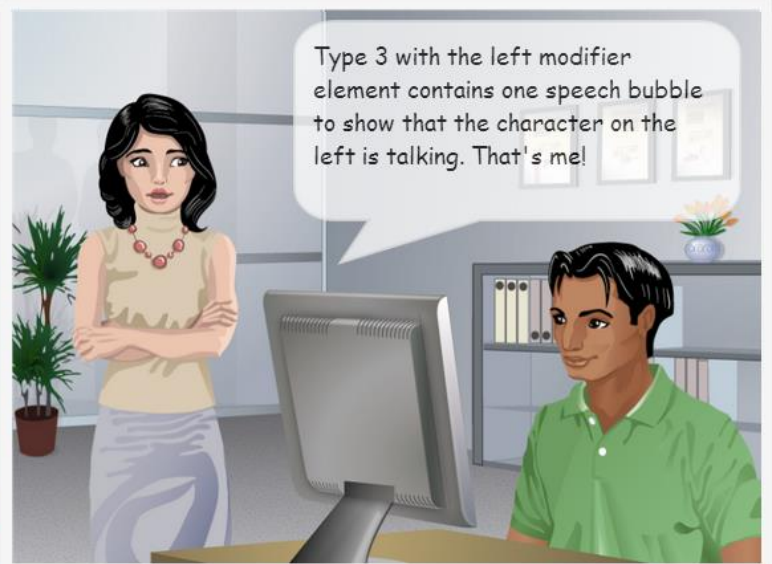
Displayed and Explained



This is Type 1. This is where narration goes when it needs to be at the top of the panel image. Looks like someone's not too happy.



Here is Type 2. It also contains narration, but at the bottom of the panel image.

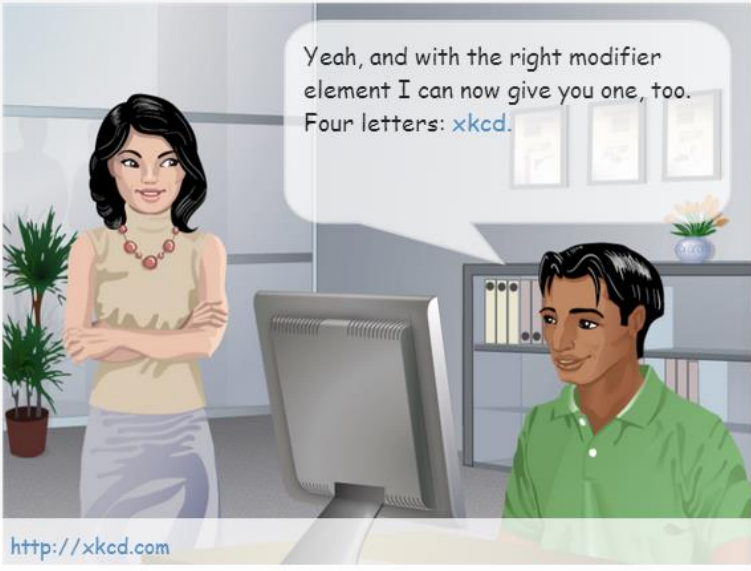


Type 3 with the left modifier element contains one speech bubble to show that the character on the left is talking. That's me!




The previous panel was Type 7, which only shows an image. Hence, why I am telling you about it here, in this Type 8 panel. This panel contains nothing but text. If I had more to say here, I could fill it all!






Yeah, and with the right modifier element I can now give you one, too. Four letters: `xkcd`.

<http://xkcd.com>




I talk first again with the left modifier element and Type 14. However, I only need this panel type if I have a lot to say and...

...if what I have to say needs to go inside the same panel.



I really don't need both of these speech bubbles, but I am required to show you what Type 14 looks like with the right modifier element.

You can pretend I am saying something important here.



What are you still reading this for? Panel Type 14 was the last one.

CHANGE YOUR DEGREE STATUS

A technical comic that shows users how to change their degree status



© TechCommix

CHANGE YOUR DEGREE STATUS

A technical comic that shows users how to change their degree status



© TechCommix

GET NETWORKING!

A technical comic on the importance of networking



© TechCommix

TECHCOMMIX: DON'T KNOCK IT UNTIL YOU TRY IT!

A tool for creating and exporting your technical comics



© TechCommix

Based on illustrations from Sun Microsystems, Inc.

RESEARCH CREDITS - HOW MANY AND WHICH ONES

A technical comic that discusses VT CS research credits



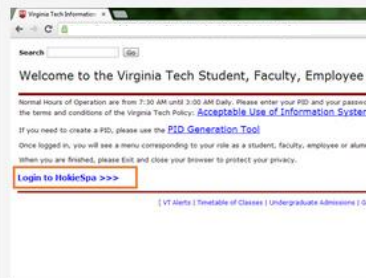
© TechCommix

VIEW YOUR VT PLAN OF STUDY (POS)

A technical comic that shows users how to view their current Plan of Study and its status online



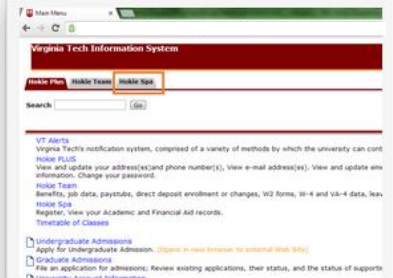
Go to hokiespa.vt.edu.



Then, here we are.



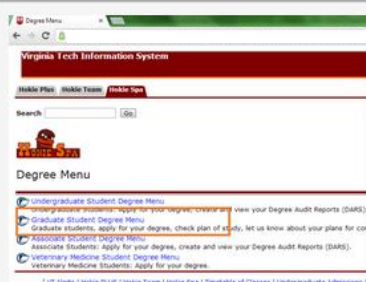
Login using your pid and VT password. Wow, and I thought I had a strong password.



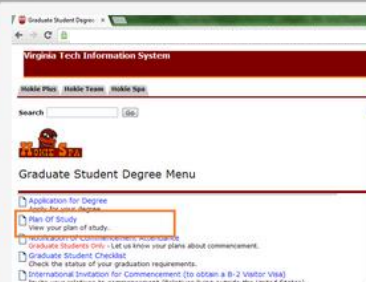
Go to the "HokieSpa" tab at the top, under the website banner.



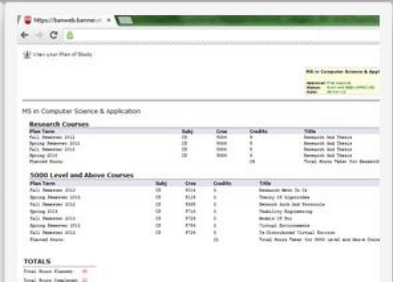
Click "Degree Menu."



Click the "Graduate Student Degree Menu" link.



Click on the "Plan of Study" link, the second one in the list.



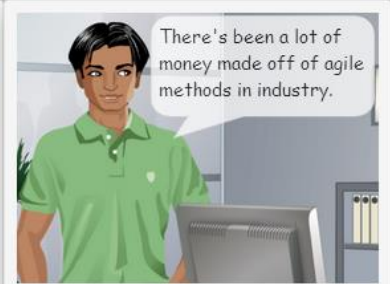
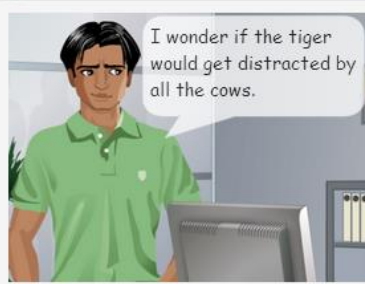
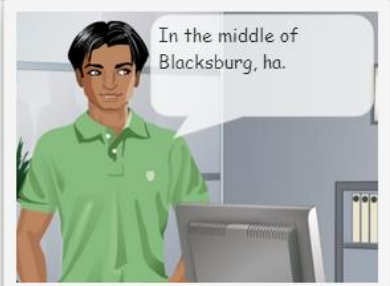
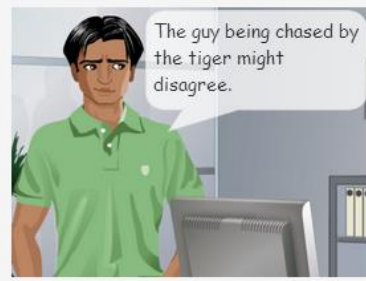
And there you go, the POS status box and the approved content.



BAD SOUP

Or just too many ingredients: A technical comic on words, wisdom, and presented models and theories from the Morgan and Claypool's Synthesis Lectures on Human-Centered Informatics







Appendix C - IRB Documentation

IRB Protocol Document

Once complete, upload this form as a Word document to the IRB Protocol Management System: <https://secure.research.vt.edu/irb>

Section 1: General Information

1.1 DO ANY OF THE INVESTIGATORS OF THIS PROJECT HAVE A REPORTABLE CONFLICT OF INTEREST? (<http://www.irb.vt.edu/pages/researchers.htm#conflict>)

- ☒ **No**
☐ **Yes, explain:**

1.2 WILL THIS RESEARCH INVOLVE COLLABORATION WITH ANOTHER INSTITUTION?

- ☒ **No, go to question 1.3**
☐ **Yes, answer questions within table**

IF YES
Provide the name of the institution [for institutions located overseas, please also provide name of country]:
Indicate the status of this research project with the other institution's IRB: <input type="checkbox"/> Pending approval <input type="checkbox"/> Approved <input type="checkbox"/> Other institution does not have a human subject protections review board <input type="checkbox"/> Other, explain:
Will the collaborating institution(s) be engaged in the research? http://www.hhs.gov/ohrp/policy/engage08.html <input type="checkbox"/> No <input type="checkbox"/> Yes
Will Virginia Tech's IRB review all human subject research activities involved with this project? <input type="checkbox"/> No, provide the name of the primary institution: <input type="checkbox"/> Yes <i>Note: primary institution = primary recipient of the grant or main coordinating center</i>

1.3 IS THIS RESEARCH FUNDED?

- ☒ **No, go to question 1.4**
☐ **Yes, answer questions within table**

IF YES
Provide the name of the sponsor [if NIH, specify department]:
Is this project receiving federal funds? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes,

Does the grant application, OSP proposal, or “statement of work” related to this project include activities involving human subjects that are not covered within this IRB application?

- ☐ No, all human subject activities are covered in this IRB application
- ☐ Yes, however these activities will be covered in future VT IRB applications, these activities include:
- ☐ Yes, however these activities have been covered in past VT IRB applications, the IRB number(s) are as follows:
- ☐ Yes, however these activities have been or will be reviewed by another institution’s IRB, the name of this institution is as follows:
- ☐ Other, explain:

Is Virginia Tech the primary awardee or the coordinating center of this grant?

- ☐ No, provide the name of the primary institution:
- ☐ Yes

1.4 DOES THIS STUDY INVOLVE CONFIDENTIAL OR PROPRIETARY INFORMATION (OTHER THAN HUMAN SUBJECT CONFIDENTIAL INFORMATION), OR INFORMATION RESTRICTED FOR NATIONAL SECURITY OR OTHER REASONS BY A U.S. GOVERNMENT AGENCY?

For example – government / industry proprietary or confidential trade secret information

- ☒ No
- ☐ Yes, describe:

1.5 DOES THIS STUDY INVOLVE SHIPPING ANY TANGIBLE ITEM, BIOLOGICAL OR SELECT AGENT OUTSIDE THE U.S?

- ☒ No
- ☐ Yes

Section 2: Justification

2.1 DESCRIBE THE BACKGROUND, PURPOSE, AND ANTICIPATED FINDINGS OF THIS STUDY:

We are seeking participants 18 years of age or older for a study on the style of how to documentation. Data collected during this study will contribute knowledge in terms of technical documentation discourse and format type, relating to both authorship and readership. The findings will be analyzed for contributions towards a foundation for technical communications.

2.2 EXPLAIN WHAT THE RESEARCH TEAM PLANS TO DO WITH THE STUDY RESULTS:

For example - publish or use for dissertation

The research teams plans on using the results of this study for use in publications and a thesis.

Section 3: Recruitment

3.1 DESCRIBE THE SUBJECT POOL, INCLUDING INCLUSION AND EXCLUSION CRITERIA AND NUMBER OF SUBJECTS:

Examples of inclusion/exclusion criteria - gender, age, health status, ethnicity

The subject pool will be participants 18 years of age and older.

3.2 WILL EXISTING RECORDS BE USED TO IDENTIFY AND CONTACT / RECRUIT SUBJECTS?

Examples of existing records - directories, class roster, university records, educational records

- ☒ **No**, go to question 3.3
☐ **Yes**, answer questions within table

IF YES
Are these records private or public? <input type="checkbox"/> Public <input type="checkbox"/> Private, describe the researcher's privilege to the records:
Will student, faculty, and/or staff records or contact information be requested from the University? <input type="checkbox"/> No <input type="checkbox"/> Yes, visit the following link for further information: http://www.policies.vt.edu/index.php (policy no. 2010)

3.3 DESCRIBE RECRUITMENT METHODS, INCLUDING HOW THE STUDY WILL BE ADVERTISED OR INTRODUCED TO SUBJECTS:

The study will be advertised through university listservs, university email announcements, VT department SONA and Research Participation Systems, and general student email circulation and discussion generated by the announcement of the study.

3.4 PROVIDE AN EXPLANATION FOR CHOOSING THIS POPULATION:

Note: the IRB must ensure that the risks and benefits of participating in a study are distributed equitably among the general population and that a specific population is not targeted because of ease of recruitment.

The subject pool is only limited to participants 18 years and older, which leaves the announcement circulation open for multiple communication methods.

Section 4: Consent Process

For more information about consent process and consent forms visit the following link: <http://www.irb.vt.edu/pages/consent.htm>

If feasible, researchers are advised and may be required to obtain signed consent from each participant unless obtaining signatures leads to an increase of risk (e.g., the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting in a breach of confidentiality). Signed consent is typically not required for low risk questionnaires (consent is implied) unless audio/video recording or an in-person interview is involved. If researchers will not be obtaining signed consent, participants must, in most cases, be supplied with consent information in a different format (e.g., in recruitment document, at the beginning of survey instrument, read to participant over the phone, information sheet physically or verbally provided to participant).

4.1 CHECK ALL OF THE FOLLOWING THAT APPLY TO THIS STUDY'S CONSENT PROCESS:

- ☐ Verbal consent will be obtained from participants
☐ Written/signed consent will be obtained from participants
☐ Consent will be implied from the return of completed questionnaire. Note: The IRB recommends providing consent information in a recruitment document or at the beginning of the questionnaire (if the study only involves implied consent, skip to Section 5 below)
☒ Other, describe: **Consent will be obtained from a digital signature from the participants in the form of an accept check box.**

4.2 PROVIDE A GENERAL DESCRIPTION OF THE PROCESS THE RESEARCH TEAM WILL USE TO OBTAIN AND MAINTAIN INFORMED CONSENT:

Consent information will be provided at the beginning of the study. By selecting the accept check box of a digital informed consent document, the participant will acknowledge that he or she is 18 years of age or older and voluntarily agrees to participate in this study. The informed consent document states that if the participant unable to complete the study, he or she may withdraw at any time. If the participant does not accept, then they are declining to participate. Thus, those who decline the consent information will not continue with the rest of the study process.

4.3 WHO, FROM THE RESEARCH TEAM, WILL BE OVERSEEING THE PROCESS AND OBTAINING CONSENT FROM SUBJECTS?

Rebecca Zeitz and Rebecca Huey will be overseeing the process and obtaining consent from the subjects.

4.4 WHERE WILL THE CONSENT PROCESS TAKE PLACE?

The consent process will take place in the location at which the study will take place.

4.5 DURING WHAT POINT IN THE STUDY PROCESS WILL CONSENTING OCCUR?

Note: unless waived by the IRB, participants must be consented before completing any study procedure, including screening questionnaires.

The consent process will be the first step in the study.

4.6 IF APPLICABLE, DESCRIBE HOW THE RESEARCHERS WILL GIVE SUBJECTS AMPLE TIME TO REVIEW THE CONSENT DOCUMENT BEFORE SIGNING:

Note: typically applicable for complex studies, studies involving more than one session, or studies involving more of a risk to subjects.

☒ Not applicable

Section 5: Procedures

5.1 PROVIDE A STEP-BY-STEP THOROUGH EXPLANATION OF ALL STUDY PROCEDURES EXPECTED FROM STUDY PARTICIPANTS, INCLUDING TIME COMMITMENT & LOCATION:

The study will take approximately one hour. The study location will be in a room in one of the Virginia Tech academic buildings; the exact room and building will depend on the number of participants attending the session and the availability of the rooms. The process for the study participants will be as follows.

1. A participant will sign up for the study
2. Show up at the allotted study time
3. Read the consent information documentation
4. If the participant declines, then they are done and the study process stops here
5. Else if the participant accepts, they will be directed to the pre-questionnaire
6. Fill out the pre-questionnaire
7. Read the how to documentation for Task 1
8. Answer the Task 1 questions
9. Read the how to documentation for Task 2
10. Answer the Task 2 questions
11. Read the how to documentation for Task 3
12. Answer the Task 3 questions
13. Fill out the post-questionnaire

5.2 DESCRIBE HOW DATA WILL BE COLLECTED AND RECORDED:

Data will be collected digitally.

5.3 DOES THE PROJECT INVOLVE ONLINE RESEARCH ACTIVITIES (INCLUDES ENROLLMENT, RECRUITMENT, SURVEYS)?

View the "Policy for Online Research Data Collection Activities Involving Human Subjects" at

<http://www.irb.vt.edu/documents/onlinepolicy.pdf>

- ☐ No, go to question 6.1
☒ Yes, answer questions within table

IF YES

Identify the service / program that will be used:

- ☐ www.survey.vt.edu, go to question 6.1
☐ Blackboard, go to question 6.1
☐ Center for Survey Research, go to question 6.1
☒ Other

IF OTHER:

Name of service / program: **Qualtrics Surveys**

URL: **<http://qualtrics.com/>**

This service is...

- ☒ Included on the list found at: <http://www.irb.vt.edu/pages/validated.htm>
☐ Approved by VT IT Security
☐ An external service with proper SSL or similar encryption (https://) on the login (if applicable) and all other data collection pages.
☐ None of the above (note: only permissible if this is a collaborative project in which VT individuals are only responsible for data analysis, consulting, or recruitment)

Section 6: Risks and Benefits

6.1 WHAT ARE THE POTENTIAL RISKS (E.G., EMOTIONAL, PHYSICAL, SOCIAL, LEGAL, ECONOMIC, OR DIGNITY) TO STUDY PARTICIPANTS?

There are no more risks associated with this study than everyday tasking and reading on a computer.

6.2 EXPLAIN THE STUDY'S EFFORTS TO REDUCE POTENTIAL RISKS TO SUBJECTS:

Participants may withdraw from the study at any time.

6.3 WHAT ARE THE DIRECT OR INDIRECT ANTICIPATED BENEFITS TO STUDY PARTICIPANTS AND/OR SOCIETY?

Data collected during this study will contribute knowledge in terms of technical documentation discourse and format type, relating to both authorship and readership.

Section 7: Full Board Assessment

7.1 DOES THE RESEARCH INVOLVE MICROWAVES/X-RAYS, OR GENERAL ANESTHESIA OR SEDATION?

- ☒ No
☐ Yes

7.2 DO RESEARCH ACTIVITIES INVOLVE PRISONERS, PREGNANT WOMEN, FETUSES, HUMAN IN VITRO FERTILIZATION, OR MENTALLY DISABLED PERSONS?

- ☒ No, go to question 7.3
☐ Yes, answer questions within table

IF YES

This research involves:

- ☐ Prisoners
☐ Pregnant women ☐ Fetuses ☐ Human in vitro fertilization
☐ Mentally disabled persons

7.3 DOES THIS STUDY INVOLVE MORE THAN MINIMAL RISK TO STUDY PARTICIPANTS?

Minimal risk means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily activities or during the performance of routine physical or psychological examinations or tests. Examples of research involving greater than minimal risk include collecting data about abuse or illegal activities. Note: if the project qualifies for Exempt review (<http://www.irb.vt.edu/pages/categories.htm>), it will not need to go to the Full Board.

- ☒ No
☐ Yes

IF YOU ANSWERED “YES” TO **ANY ONE** OF THE ABOVE QUESTIONS, 7.1, 7.2, OR 7.3, THE BOARD MAY REVIEW THE PROJECT’S APPLICATION MATERIALS AT ITS MONTHLY MEETING. VIEW THE FOLLOWING LINK FOR DEADLINES AND ADDITIONAL INFORMATION: <http://www.irb.vt.edu/pages/deadlines.htm>

Section 8: Confidentiality / Anonymity

For more information about confidentiality and anonymity visit the following link: <http://www.irb.vt.edu/pages/confidentiality.htm>

8.1 WILL PERSONALLY IDENTIFYING STUDY RESULTS OR DATA BE RELEASED TO ANYONE OUTSIDE OF THE RESEARCH TEAM?

For example – to the funding agency or outside data analyst, or participants identified in publications with individual consent

- ☒ No
☐ Yes, to whom will identifying data be released?

8.2 WILL ANY STUDY FILES CONTAIN PARTICIPANT IDENTIFYING INFORMATION (E.G., NAME, CONTACT INFORMATION, VIDEO/AUDIO RECORDINGS)?

Note: if collecting signatures on a consent form, select “Yes.”

- ☐ No, go to question 8.3
☒ Yes, answer questions within table

IF YES

Describe if/how the study will utilize study codes: Each user will be assigned a participant ID and Group Number that will in no way or form be linked to the digitally signed consent form.

If applicable, where will the key [i.e., linked code and identifying information document (for instance, John Doe = study ID 001)] be stored and who will have access? There will not be a key or linking of codes to names.

Note: the key should be stored separately from subjects' completed data documents and accessibility should be limited.

The IRB strongly suggests and may require that all data documents (e.g., questionnaire responses, interview responses, etc.) do not include or request identifying information (e.g., name, contact information, etc.) from participants. If you need to link subjects' identifying information to subjects' data documents, use a study ID/code on all data documents.

8.3 WHERE WILL DATA BE STORED?

Examples of data - questionnaire, interview responses, downloaded online survey data, observation recordings, biological samples

All data will be in digital form and stored encrypted on an external memory device kept behind a locked door in Dr. Perez-Quinones office.

8.4 WHO WILL HAVE ACCESS TO STUDY DATA?

Only the project investigators will have access to the study data.

8.5 DESCRIBE THE PLANS FOR RETAINING OR DESTROYING THE STUDY DATA

Data will be retained for three years.

8.6 DOES THIS STUDY REQUEST INFORMATION FROM PARTICIPANTS REGARDING ILLEGAL BEHAVIOR?

☒ **No**, go to question 9.1

☐ **Yes**, answer questions within table

IF YES

Does the study plan to obtain a Certificate of Confidentiality?

☐ No

☐ Yes (Note: participants must be fully informed of the conditions of the Certificate of Confidentiality within the consent process and form)

For more information about Certificates of Confidentiality, visit the following link:

<http://www.irb.vt.edu/pages/coc.htm>

Section 9: Compensation

For more information about compensating subjects, visit the following link: <http://www.irb.vt.edu/pages/compensation.htm>

9.1 WILL SUBJECTS BE COMPENSATED FOR THEIR PARTICIPATION?

☐ **No**, go to question 10.1

☒ **Yes**, answer questions within table

IF YES

What is the amount of compensation? For participants signing up through a research system, the compensation will be the credits granted through the SONA or other Research Participation System. For participants receiving credit for a course, the amount of extra credit is course dependent. An example extra credit compensation is 10 points towards one of their assignment

grades.

Will compensation be prorated?

☐ Yes, please describe:

☒ No, explain why and clarify whether subjects will receive full compensation if they withdraw from the study? **Participants will receive full credit for attempting the study, even if they are unable to complete it.**

Unless justified by the researcher, compensation should be prorated based on duration of study participation. Payment must not be contingent upon completion of study procedures. In other words, even if the subject decides to withdraw from the study, he/she should be compensated, at least partially, based on what study procedures he/she has completed.

Section 10: Audio / Video Recording

For more information about audio/video recording participants, visit the following link: <http://www.irb.vt.edu/pages/recordings.htm>

10.1 WILL YOUR STUDY INVOLVE VIDEO AND/OR AUDIO RECORDING?

☒ **No**, go to question 11.1

☐ **Yes**, answer questions within table

IF YES

This project involves:

☐ Audio recordings only

☐ Video recordings only

☐ Both video and audio recordings

Provide compelling justification for the use of audio/video recording:

How will data within the recordings be retrieved / transcribed?

How and where will recordings (e.g., tapes, digital data, data backups) be stored to ensure security?

Who will have access to the recordings?

Who will transcribe the recordings?

When will the recordings be erased / destroyed?

Section 11: Research Involving Students

11.1 DOES THIS PROJECT INCLUDE STUDENTS AS PARTICIPANTS?

☐ **No**, go to question 12.1

☒ **Yes**, answer questions within table

IF YES

Does this study involve conducting research with students of the researcher?

<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, describe safeguards the study will implement to protect against coercion or undue influence for participation: <i>Note: if it is feasible to use students from a class of students not under the instruction of the researcher, the IRB recommends and may require doing so.</i>
Will the study need to access student records (e.g., SAT, GPA, or GRE scores)? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes

11.2 DOES THIS PROJECT INCLUDE ELEMENTARY, JUNIOR, OR HIGH SCHOOL STUDENTS?

- ☒ **No**, go to question 11.3
☐ **Yes**, answer questions within table

IF YES
Will study procedures be completed during school hours? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, <p style="text-align: center;">Students not included in the study may view other students' involvement with the research during school time as unfair. Address this issue and how the study will reduce this outcome:</p> <p style="text-align: center;">Missing out on regular class time or seeing other students participate may influence a student's decision to participate. Address how the study will reduce this outcome:</p>
Is the school's approval letter(s) attached to this submission? <input type="checkbox"/> Yes <input type="checkbox"/> No, project involves Montgomery County Public Schools (MCPS) <input type="checkbox"/> No, explain why: <i>You will need to obtain school approval (if involving MCPS, click here: http://www.irb.vt.edu/pages/mcps.htm). Approval is typically granted by the superintendent, principal, and classroom teacher (in that order). Approval by an individual teacher is insufficient. School approval, in the form of a letter or a memorandum should accompany the approval request to the IRB.</i>

11.3 DOES THIS PROJECT INCLUDE COLLEGE STUDENTS?

- ☐ **No**, go to question 12.1
☒ **Yes**, answer questions within table

IF YES
Some college students might be minors. Indicate whether these minors will be included in the research or actively excluded: <input type="checkbox"/> Included <input checked="" type="checkbox"/> Actively excluded, describe how the study will ensure that minors will not be included: The students must acknowledge on the digital consent form that they are 18 years of age or older.
Will extra credit be offered to subjects? <input type="checkbox"/> No

☒ Yes

If yes,

What will be offered to subjects as an equal alternative to receiving extra credit without participating in this study? Subjects will be offered multiple alternative extra credit assignments that are dependent on the course for which the extra credit is being offered. The instructor of the course will make the alternatives clear and worth the same amount of extra credit being offered for the study.

Include a description of the extra credit (e.g., amount) to be provided within question 9.1 ("IF YES" table)

Section 12: Research Involving Minors

12.1 DOES THIS PROJECT INVOLVE MINORS (UNDER THE AGE OF 18 IN VIRGINIA)?

Note: age constituting a minor may differ in other States.

☐ No, go to question 13.1

☐ Yes, answer questions within table

IF YES

Does the project reasonably pose a risk of reports of current threats of abuse and/or suicide?

☐ No

☐ Yes, thoroughly explain how the study will react to such reports:

Note: subjects and parents must be fully informed of the fact that researchers must report threats of suicide or suspected/reported abuse to the appropriate authorities within the Confidentiality section of the Consent, Assent, and/or Permission documents.

Are you requesting a waiver of parental permission (i.e., parent uninformed of child's involvement)?

☐ No, **both** parents/guardians will provide their permission, if possible.

☐ No, **only one** parent/guardian will provide permission.

☐ Yes, describe below how your research meets **all** of the following criteria (A-D):

Criteria A - The research involves no more than minimal risk to the subjects:

Criteria B - The waiver will not adversely affect the rights and welfare of the subjects:

Criteria C - The research could not practicably be carried out without the waiver:

Criteria D - (Optional) Parents will be provided with additional pertinent information after participation:

Is it possible that minor research participants will reach the legal age of consent (18 in Virginia) while enrolled in this study?

☐ No

☐ Yes, will the investigators seek and obtain the legally effective informed consent (in place of the minors' previously provided assent and parents' permission) for the now-adult subjects for any ongoing interactions with the subjects, or analysis of subjects' data? If yes, explain how:

For more information about minors reaching legal age during enrollment, visit the following link:

<http://www.irb.vt.edu/pages/assent.htm>

*The procedure for obtaining assent from minors and permission from the minor's guardian(s) must be described in **Section 4** (Consent Process) of this form.*

Section 13: Research Involving Deception

For more information about involving deception in research and for assistance with developing your debriefing form, visit our website at <http://www.irb.vt.edu/pages/deception.htm>

13.1 DOES THIS PROJECT INVOLVE DECEPTION?

☒ **No**, go to question 14.1

☐ **Yes**, answer questions within table

IF YES

Describe the deception:

Why is the use of deception necessary for this project?

Describe the debriefing process:

Provide an explanation of how the study meets all the following criteria (A-D) for an alteration of consent:

Criteria A - The research involves no more than minimal risk to the subjects:

Criteria B - The alteration will not adversely affect the rights and welfare of the subjects:

Criteria C - The research could not practicably be carried out without the alteration:

Criteria D - (Optional) Subjects will be provided with additional pertinent information after participation (i.e., debriefing for studies involving deception):

By nature, studies involving deception cannot provide subjects with a complete description of the study during the consent process; therefore, the IRB must allow (by granting an alteration of consent) a consent process which does not include, or which alters, some or all of the elements of informed consent.

The IRB requests that the researcher use the title "Information Sheet" instead of "Consent Form" on the document used to obtain subjects' signatures to participate in the research. This will adequately reflect the fact that the subject cannot fully consent to the research without the researcher fully disclosing the true intent of the research.

Section 14: Research Involving Existing Data

14.1 WILL THIS PROJECT INVOLVE THE COLLECTION OR STUDY/ANALYSIS OF EXISTING DATA DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS, OR DIAGNOSTIC SPECIMENS?

Please note: it is not considered existing data if a researcher transfers to Virginia Tech from another institution and will be conducting data analysis of an on-going study.

☒ **No**, you are finished with the application

☐ **Yes**, answer questions within table

IF YES

From where does the existing data originate?

Provide a detailed description of the existing data that will be collected or studied/analyzed:

Is the source of the data public?

- ☐ No, continue with the next question
☐ Yes, you are finished with this application

Will any individual associated with this project (internal or external) have access to or be provided with existing data containing information which would enable the identification of subjects:

- **Directly** (e.g., by name, phone number, address, email address, social security number, student ID number), or
- **Indirectly through study codes** even if the researcher or research team does not have access to the master list linking study codes to identifiable information such as name, student ID number, etc or
- **Indirectly through the use of information that could reasonably be used in combination to identify an individual** (e.g., demographics)

- ☐ No, collected/analyzed data will be completely de-identified
☐ Yes,

If yes,

Research will not qualify for exempt review; therefore, if feasible, written consent must be obtained from individuals whose data will be collected / analyzed, unless this requirement is waived by the IRB.

Will written/signed or verbal consent be obtained from participants prior to the analysis of collected data? -select one-

This research protocol represents a contract between all research personnel associated with the project, the University, and federal government; therefore, must be followed accordingly and kept current.

Proposed modifications must be approved by the IRB prior to implementation except where necessary to eliminate apparent immediate hazards to the human subjects.

Do not begin human subjects activities until you receive an IRB approval letter via email.

It is the Principal Investigator's responsibility to ensure all members of the research team who interact with research subjects, or collect or handle human subjects data have completed human subjects protection training prior to interacting with subjects, or handling or collecting the data.

-----END-----

IRB Approval Letter

MEMORANDUM**DATE:** February 20, 2014**TO:** Carlos Evia, Manuel A Perez-Quinonez, Rebecca Ann Zeitz, Rebecka Katherine Huey**FROM:** Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)**PROTOCOL TITLE:** TechCommix: A Tool and Foundation for Rethinking and Restructuring Technical Documentation**IRB NUMBER:** 14-102

Effective February 19, 2014, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2**

Protocol Approval Date: **February 19, 2014**

Protocol Expiration Date: **N/A**

Continuing Review Due Date*: **N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

IRB Amendment Application – April 3, 2014

Amendment Application

1

Requesting Amendment To:

Recruitment Material(s) — Change the wording of the title, added actual location of McBryde Hall 110, added the IRB approval number at the bottom

Consent Form(s) — Changed the wording of the title shown to the participants; added that the study was approved and the IRB approval number; added information on how to anonymously sign up for the study

Data Collection Instrument(s) (e.g., survey, interview questions) — Changed 3 questions in Task1_Questions and put the questions into the actual survey format; Changed 1 question in Task2_Questions and put the questions into the actual survey format; Changed 1 question in Task3_Questions and put the questions into the actual survey format; Pre Questionnaire is now in the actual survey format; Post Questionnaire has wording changes to the task names as the multiple choice answers and is now in the actual survey format

Other/Misc. — Changed the wording of the task names in the GroupOrderReference.docx; Have added a word doc with the participant id's, brief instructions, the link to access the surveys, and the task ordering

2

Have these requested changes been initiated?

Answer: No

3

How will the proposed amendment affect study participants?

The proposed amendment is still in line with the original type of questions and wording of the original documentation approved by the IRB. Thus, it will not really affect the study participants but by them reading something slightly different than from the original documentation.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

IRB Amendment Approval Letter – April 3, 2014

MEMORANDUM

DATE: April 3, 2014

TO: Carlos Evia, Manuel A Perez-Quinonez, Rebecca Ann Zeitz, Rebecka Katherine Huey

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)

PROTOCOL TITLE: TechCommix: A Tool and Foundation for Rethinking and Restructuring Technical Documentation

IRB NUMBER: 14-102

Effective April 2, 2014, the Virginia Tech Institutional Review Board (IRB) Chair, David M Moore, approved the Amendment request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<http://www.irb.vt.edu/pages/responsibilities.htm>

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2**
Protocol Approval Date: **February 19, 2014**
Protocol Expiration Date: **N/A**
Continuing Review Due Date*: **N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

IRB Amendment Application – April 10, 2014

Amendment Application

1

Requesting Amendment To:

Research Protocol Document — The protocol document will be updated to account for extra credit being offered by courses. This deals with sections 9.1 and 11.3 in reference to the compensation and extra credit offering descriptions.

2

Have these requested changes been initiated?

Answer: No

3

How will the proposed amendment affect study participants?

Participants enrolled in the courses which will be offering extra credit will be granted the extra credit compensation as determined by the course instructor.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

IRB Amendment Approval Letter – April 10, 2014

MEMORANDUM

DATE: April 10, 2014

TO: Carlos Evia, Manuel A Perez-Quinonez, Rebecca Ann Zeitz, Rebecka Katherine Huey

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires April 25, 2018)

PROTOCOL TITLE: TechCommix: A Tool and Foundation for Rethinking and Restructuring Technical Documentation

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(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As: **Exempt, under 45 CFR 46.110 category(ies) 2**
Protocol Approval Date: **February 19, 2014**
Protocol Expiration Date: **N/A**
Continuing Review Due Date*: **N/A**

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FEDERALLY FUNDED RESEARCH REQUIREMENTS:

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The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

Recruitment Bulletin

Recruitment Bulletin

Documentation Styles for How-To Instructions

We are seeking participants 18 years of age or older for a study on how-to documentation styles.

Sign-up Link: <https://doodle.com/v8p52i8e36cchuzr>

Location: McBryde Hall 110

Time(s): Approximately 1 Hour

Contacts:	Rebecca Zeitz	razeitz@vt.edu
	Rebecka Huey	bk1025@vt.edu
	Dr. Manuel Pérez-Quiñones	perez@cs.vt.edu
	Dr. Carlos Evia Puerto	cevia@vt.edu

The experiment will take approximately one hour. Prior to testing, you will be asked to complete a pre-questionnaire asking basic demographic and background information. You will be presented with three short how to documents for questions and document evaluation. After, you will be asked to complete a post-questionnaire on your experience. The survey is online, thus participants will be asked to bring their laptops. If a participant does not have access to a laptop, he or she is asked to please contact Rebecca Zeitz at razeitz@vt.edu.

Data collected during this study will contribute knowledge in terms of technical documentation discourse and format type, relating to both authorship and readership. The findings will be analyzed for contributions towards a foundation for technical communications.

Students enrolled in the Psychology Experiment Management System (SONA) will receive 2 points total upon participating in the experiment. Students who are [INSERT OTHER RESEARCH MANAGEMENT SYSTEM] will receive [ENTER POINTS].

Thank you for your time and consideration!

Group Order Reference

Group Number 1:

Reading 1: Request a Book Format: Prose

Reading 2: Summon Search Format: Step-oriented

Reading 3: Off Campus Sign In Format: Comic

Group Number 2:

Reading 1: Request a Book Format: Comic

Reading 2: Summon Search Format: Prose

Reading 3: Off Campus Sign In Format: Step-oriented

Group Number 3:

Reading 1: Request a Book Format: Step-oriented

Reading 2: Summon Search Format: Comic

Reading 3: Off Campus Sign In Format: Prose

Participant ID Handouts

Participant ID: 101

Study link: <http://dopey.cs.vt.edu/~mapq/study/>

You may refer to the documentation as you complete the surveys. Make sure to **submit your survey** for your current task before moving on to the next one!

[Reading 1: Request a Book](#) [Format: Prose](#)

[Reading 2: Summon Search](#) [Format: Step-oriented](#)

[Reading 3: Off Campus Sign In](#) [Format: Comic](#)

Participant ID: 201

Study link: <http://dopey.cs.vt.edu/~mapq/study/>

You may refer to the documentation as you complete the surveys. Make sure to **submit your survey** for your current task before moving on to the next one!

[Reading 1: Request a Book](#) [Format: Comic](#)

[Reading 2: Summon Search](#) [Format: Prose](#)

[Reading 3: Off Campus Sign In](#) [Format: Step-oriented](#)

Participant ID: 301

Study link: <http://dopey.cs.vt.edu/~mapq/study/>

You may refer to the documentation as you complete the surveys. Make sure to **submit your survey** for your current task before moving on to the next one!

[Reading 1: Request a Book](#) [Format: Step-oriented](#)

[Reading 2: Summon Search](#) [Format: Comic](#)

[Reading 3: Off Campus Sign In](#) [Format: Prose](#)

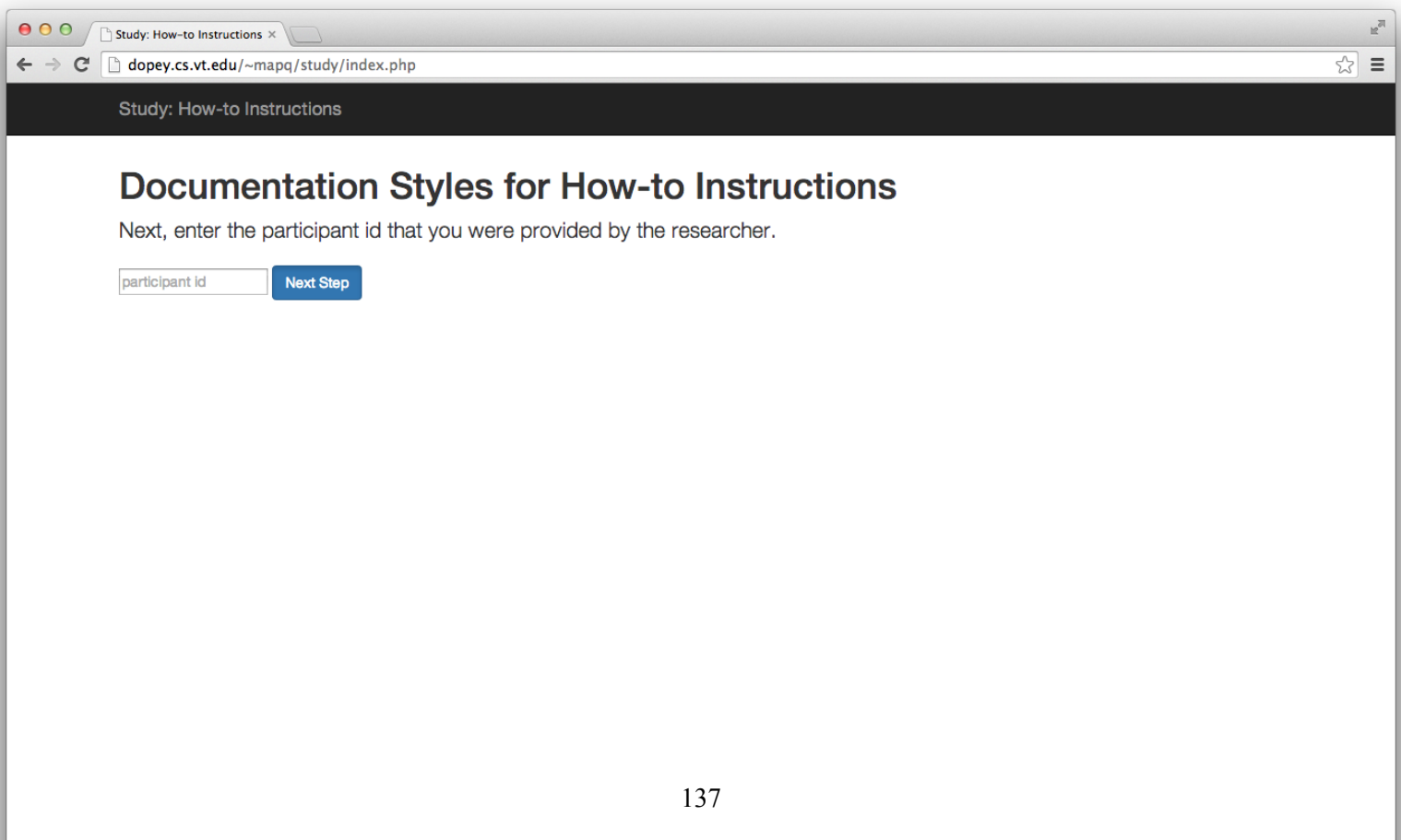
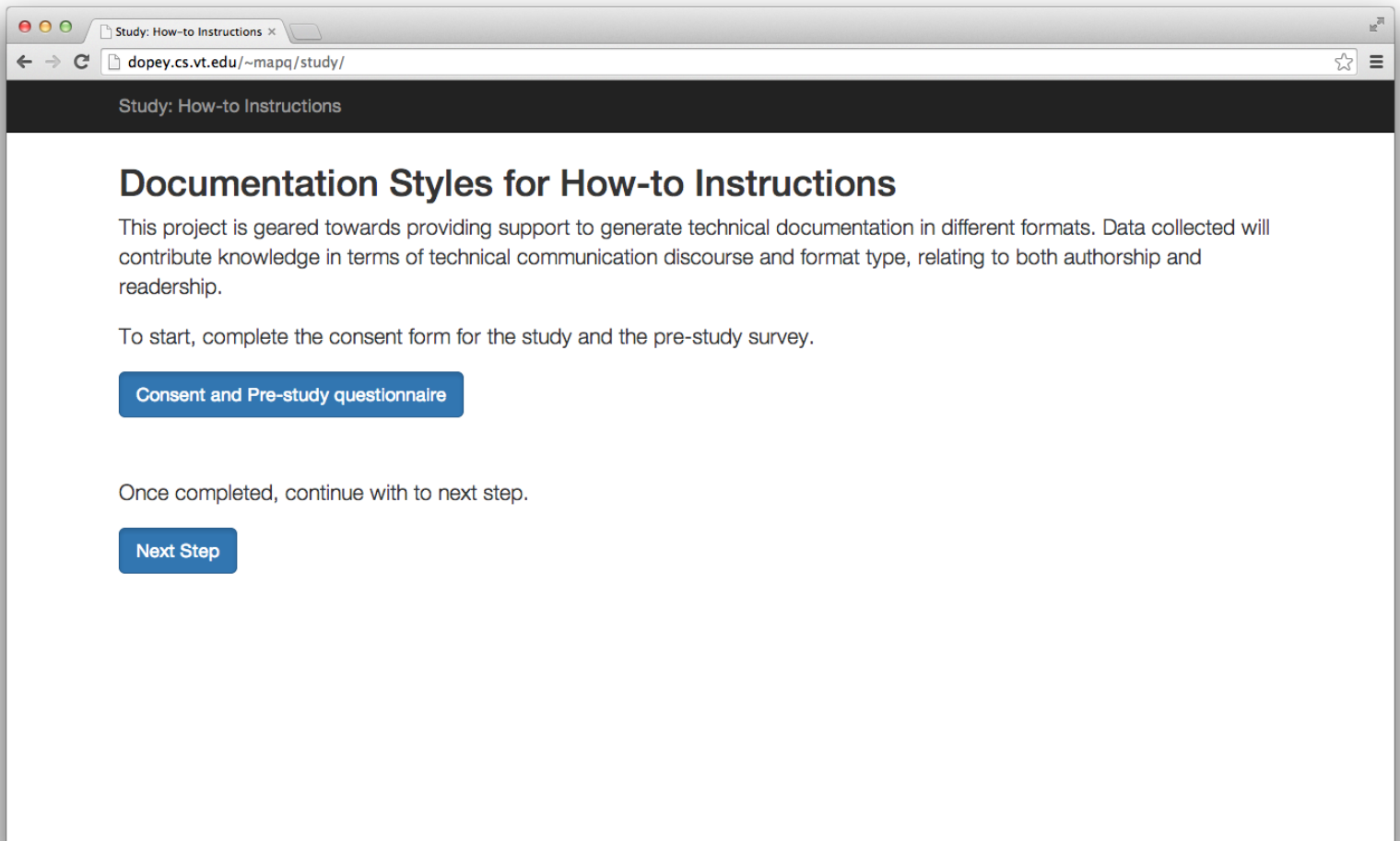
Appendix D - Study Materials

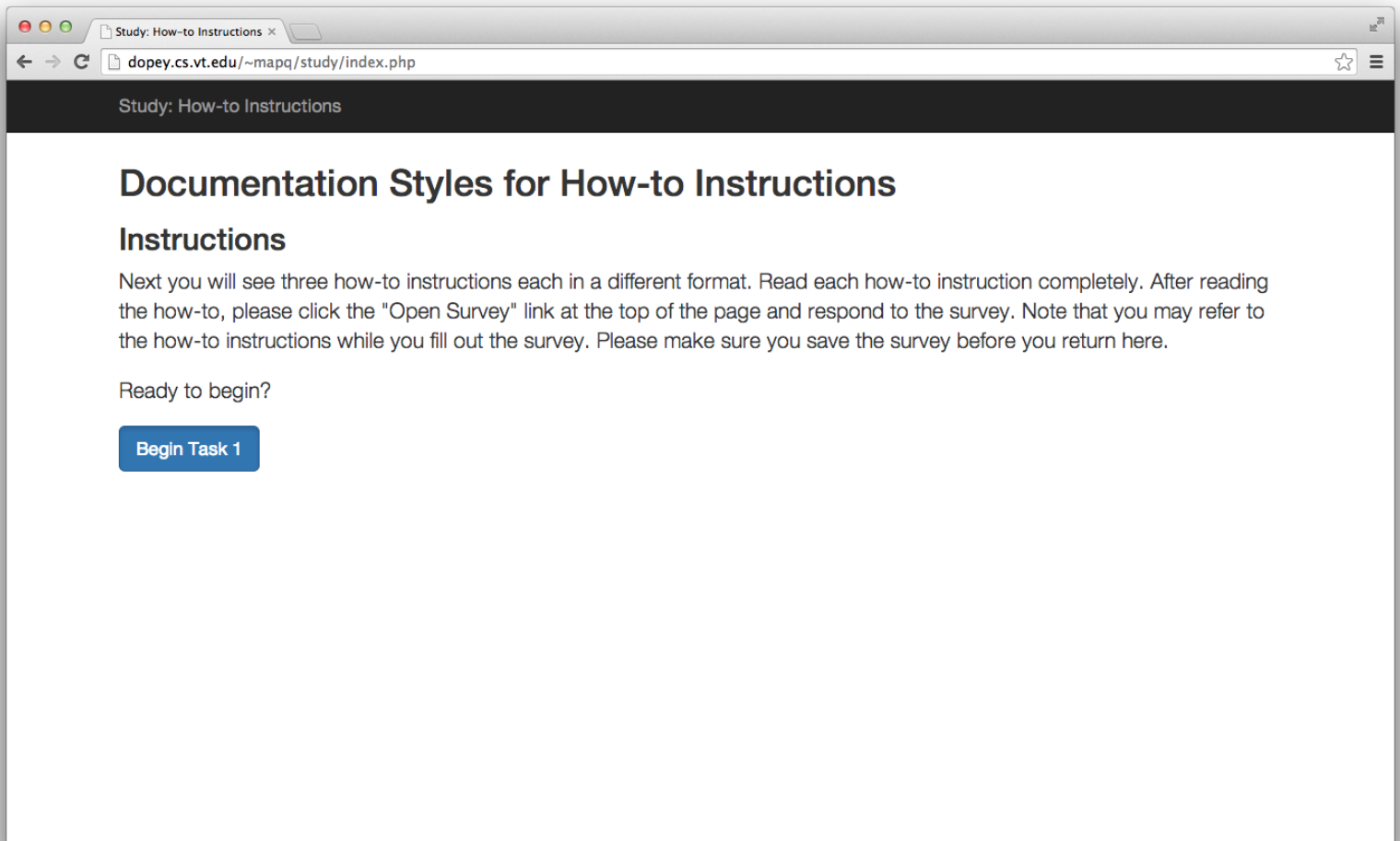
Study Interfaces

Initial Instructions

Participant ID Prompt

Task Instructions





Prose - Task 1 RB (Request a Book)

Step-oriented - Task 2 SS (Summon Search)

Comic - Task 3 OCS (Off Campus Sign In)

Study: How-to Instructions

dopey.cs.vt.edu/~mapq/study/index.php

Study: How-to Instructions

Study instructions and then complete the survey.

Open the survey

Continue to Task 2

Study of Technical Documentation Prose Style

How to request a book

There are times when you will need to request a book (or other materials): when the book is checked out to another person, when the book is located in another library, when you want the library to purchase the book, when you are not a local resident, or when the Virginia Tech Libraries do not own the book.

Request an available book from Newman or branch library

Books listed as Available in Newman or the Blacksburg branches can be requested and will be pulled and held for you at the circulation desk or delivered to participating department offices via the [Book Runner service](#). These books must be in their regular location (that excludes books in Reserve, on display, or on the new books shelf). Newman items are pulled three times a day on weekdays, twice a day on weekends. Branch libraries pull items twice a day weekdays and not on weekends. Check [My Library Account](#) for the status of your requests; books listed with a status of ON HOLDSHELF are probably waiting for you.

Books in the NVC Resource Center can be requested through ILLiad. Look for the link in the External Links box on the book's Addison record to start that request.

Request a checked out book

To request materials that have been checked out by another patron, search for the title in Addison. Use the request button at the top of the screen. Recalled items are due 21 days from when you submit the request or on the original due date: which ever comes first. Check [My Library Account](#) for the status of your requests; books listed with a status of ON HOLDSHELF are probably waiting for you.

Retrieve material from remote storage

If a book or bound journal is located in **remote storage**, you will either see a Request button next to it in a search results list or a Request button in the row of buttons at the top of the Addison screen. Click on the Request button, and Addison will ask you to enter your patron information (name and ID number) and pickup location. You can have material delivered to Newman, the Blacksburg branch libraries, or participating department office via the [Book Runner service](#). Check [My Library Account](#) for the status of your requests; books listed with a status of ON HOLDSHELF are probably waiting for you.

Request a search for missing material

If you are looking for material you can't find on the shelf, double-check its status in Addison. Make sure it's not already checked out or put on Reserve and that you are looking in the right place. If you are sure you are looking in the right location, you should check the reshelving area on that floor for the material. Note that each shelving cart is in its own call number order. You may need to check multiple carts--or sides of carts.

If you still can not find a book after following the tips above, you may request the library conduct a search for the material by using the request button in Addison.

Search requests may take up to two business days to complete. You will be notified ASAP at the completion of the search. If the item is located, it will be held for you at the Circulation Desk unless it does not circulate. Otherwise, it will be set to status *missing*, and you are then eligible to use [InterLibrary Loan to request the item](#).

Request the library purchase a book (or other material)

The Virginia Tech Libraries seriously considers all purchase suggestions. We ask that you check [Addison](#) to ensure we do not already own the book in question before submitting your request. [Submit your request](#) online.

Extended campus user access to books

If you reside outside of the New River Valley (outside the New River Valley counties of Montgomery, Giles, and Pulaski), then you are eligible to use [ILLiad](#) to have library materials (books, articles, and more) directly mailed to your home address. When you submit your request through ILLiad, interlibrary loan will fill the request from the University Libraries' collection or from the collections of other libraries (like common interlibrary loan requests are filled). Virginia Tech materials will be checked out to [your library account](#); [checkout periods](#) will vary with your status.

When you locate a book (that can be checked out) in Addison, the library catalog, you'll see a [link to request the book through ILLiad](#) in the External Links box on the right side of the screen. Use this link to login to ILLiad and then be presented with a fill-out form to request the book. If the status of the book is Available, it should be picked up and mailed to you quickly. If the book is currently checked out, ILL will initiate a recall and mail the book once it has been returned.

Request a book not owned by the Virginia Tech Libraries

If you find a book (or other material) that you need for your research that is not owned by the Virginia Tech Libraries, you can submit a request to [interlibrary loan](#), who will search other libraries for the book. If the request can be filled, the book will be mailed to the interlibrary loan department who will check it out to you. [Borrowing periods](#) and [renewal options](#) depend on the lending library.

End of instructions. You may now open the survey.

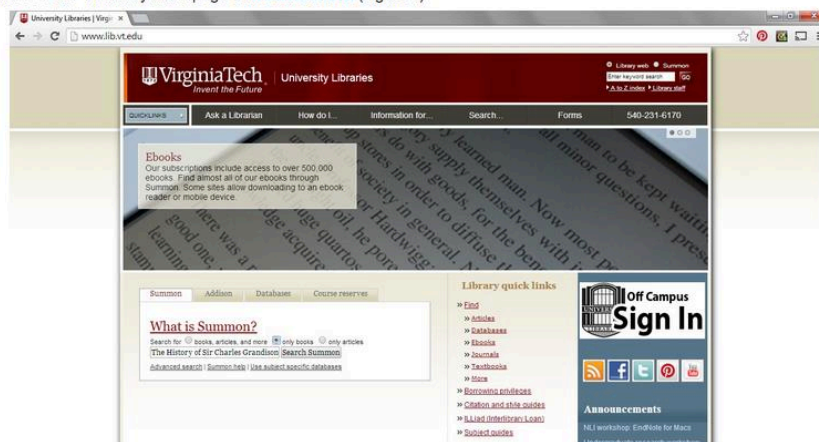
140

Study of Technical Documentation Step-oriented Style

How to use the Summon search via the Virginia Tech Library

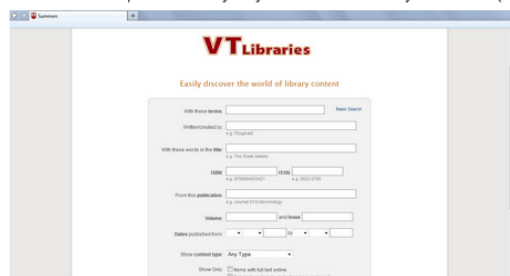
Summon allows users to search through all the items VT has local access to, including the library catalog, journals, databases, and freely available content from open access journals and government websites; basically, everything VT has access to, locally or remotely. A simple keyword search can return over a million results, so the way to get better results is to be more specific.

1. Access the VT library homepage at www.lib.vt.edu (Figure 1)



Home page for the Virginia Tech Library.

2. On the left-hand side of the screen, you will see the search bar. (Figure 2)
Search bar.
3. Advanced search provides many ways to search for library resources. (Figure 3)



Narrow your search.

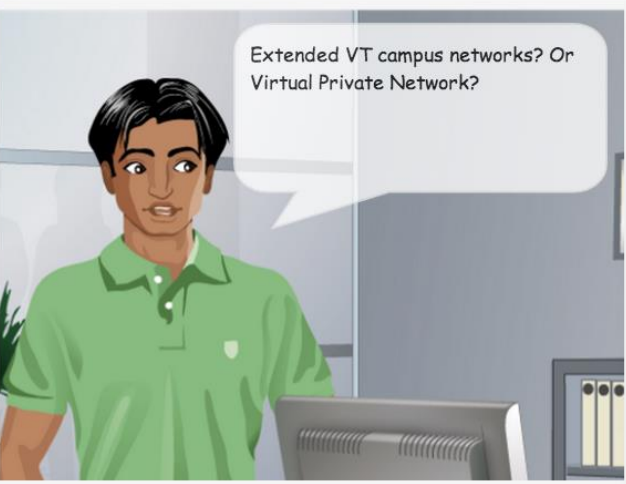
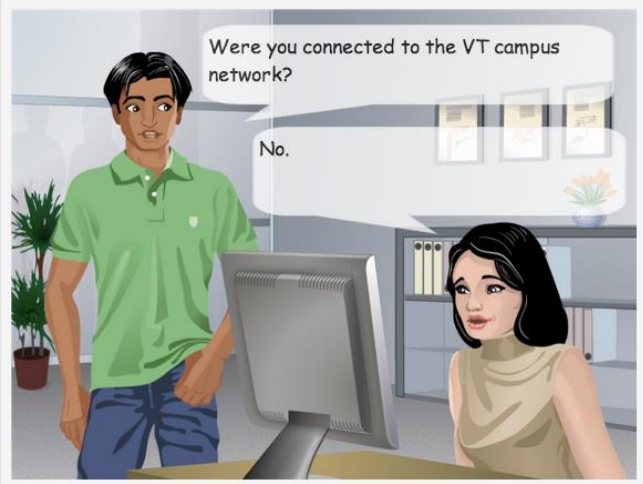
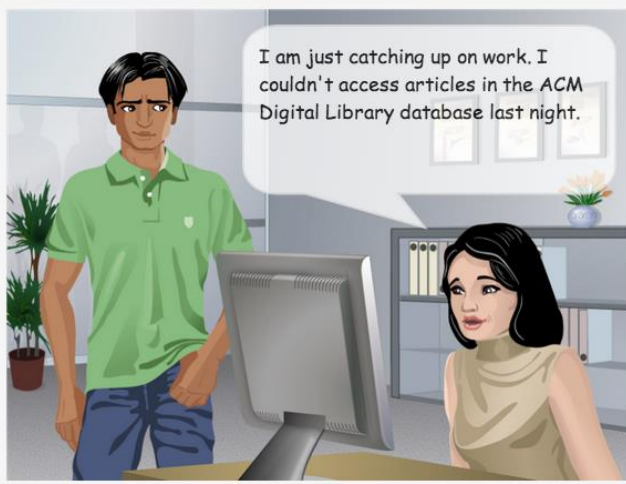
Field of search	Results
Exact Phrase Match	Typing a word or phrase into the search box will find results with the exact words you typed next to each other (i.e. "local food"). For phrases, it won't return extra results that contain "local" somewhere in the document and "food" somewhere else in the same document.
Field Match	A field search looks for a phrase or word only in a specific field, such as: ISBN number, title, subject, author, publisher, title, volume, issue, language, or other fields.
Boolean Operators	<p>Boolean operators determine relationships between words in a search. When using Boolean searches, the Boolean term must be in all capitals.</p> <p>AND: provides a search like a regular keyword search: "local food" is the same as "local AND food"</p> <p>OR: returns results that contain either or all of the search terms: "local food OR sustainable eating"</p> <p>NOT: excludes results that contain the word after NOT: "animal NOT dog" or "animal -dog"</p>
Proximity Operators	You enclose your search terms in quotes then add a tilde followed by a number that represents the distance between each of the search terms. (i.e. "yeast bread"~10) This example means results will come back with "yeast" and "bread" within 10 words of each other.
Question Mark (?)	A question mark is like a wildcard. The "wildcard" cannot be the first character of a search, but will match any other single character. (i.e. "O?n" would match "Ols" or "Olsen")
Asterisk (*)	An asterisk is also a wildcard character, however it can match zero or more characters. (i.e. "Ch*ter" would match "charter," "character," and "chapter.") When used at the end of a search, it will match all suffixes. (i.e. "temp*" would match "temple," "temporary," and "temptation.")
Tilde (~)	This is the last wildcard syntax. It is used at the end of a word, but to match similar terms. (i.e. "Lead~" would match "wead," "veade," and "tead.")

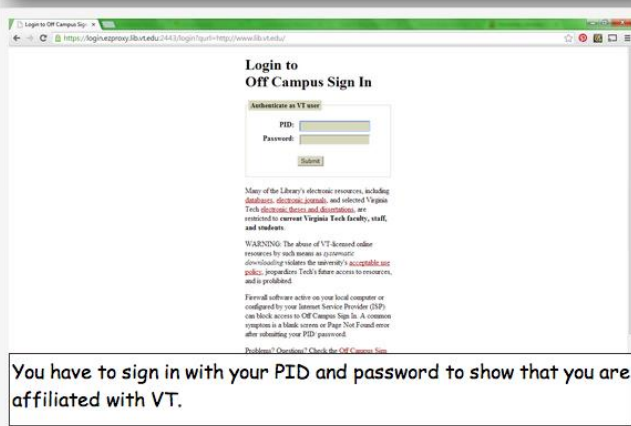
4. Once you have filled in the criteria you would like to search with, simply click search at the bottom of the form.

Study of Technical Documentation Comic Style

How to Use Off Campus Sign In

Shows users how to use the VT Library's Off Campus Sign In feature







Study: How-to Instructions

Study instructions and then complete the survey.

Open the survey

Complete Post-questionnaire

Any currently employed or retired VT faculty and staff and currently enrolled VT students who are registered in degree or credit courses.

So, I just log in with my PID and password on any of the VT Library webpages?


Indeed.

It's that simple?

Well, there is a little more to it.


Library quick links

- » [Find](#)
- » [Articles](#)
- » [Databases](#)
- » [Ebooks](#)
- » [Journals](#)
- » [Textbooks](#)
- » [More](#)
- » [Borrowing privileges](#)
- » [Citation and style guides](#)
- » [ILLiad \(Interlibrary Loan\)](#)



You are

Signed In




Announcements

NLI workshop: Mobile research and tablets offered Mar 6


Library quick links

- » [Find](#)
- » [Articles](#)
- » [Databases](#)
- » [Ebooks](#)
- » [Journals](#)
- » [Textbooks](#)
- » [More](#)
- » [Borrowing privileges](#)
- » [Citation and style guides](#)
- » [ILLiad \(Interlibrary Loan\)](#)
- » [Subject guides](#)



Off Campus

Sign In



Announcements

NLI workshop: EndNote for Macs

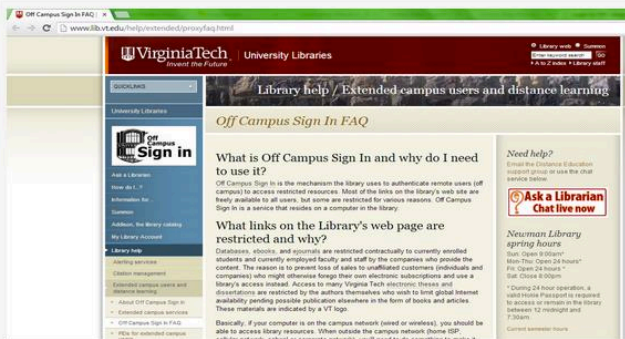
You see, after you Sign In and click Submit, the Off Campus Sign In button will then display "You Are Signed In" to indicate that you have been authenticated.

If this button goes back to displaying "Off Campus Sign In," that means you have been disconnected and will need to sign in again.

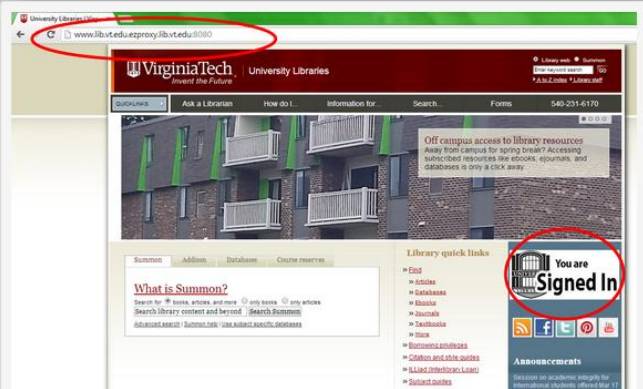
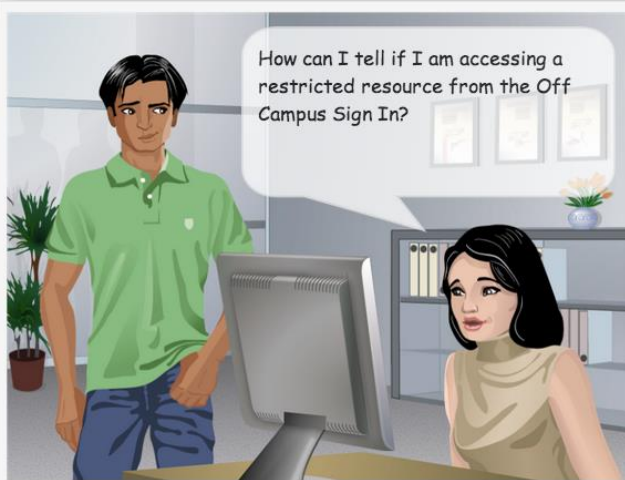
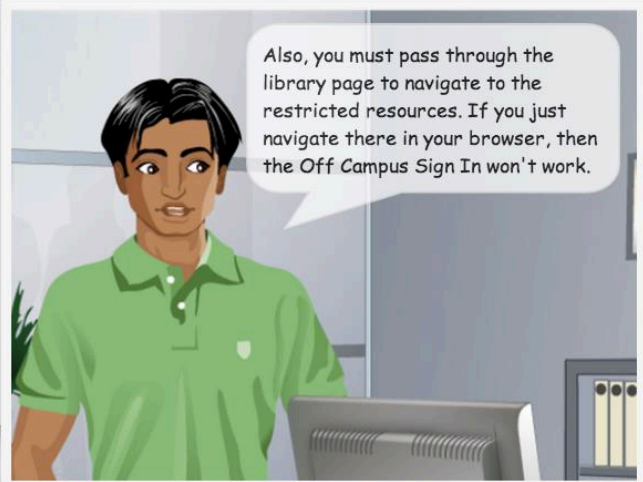
145

In button will then display "You Are Signed In" to indicate that you have been authenticated.

means you have been disconnected and will need to sign in again.



Consult the Off Campus Sign In Frequently Asked Questions page to see potential solutions to any errors you get.



Besides seeing that the button displays "You are Signed In," you can look at the URL. The Off Campus Sign In links will look different than the on campus direct links. Since the Off Campus Sign In links are proxied, links will contain the string "ezproxy.lib.vt.edu" in the URL.



Study: How-to Instructions x

dopey.cs.vt.edu/~mapq/study/index.php

Study: How-to Instructions Study instructions and then complete the survey. [Open the survey](#) [Complete Post-questionnaire](#)



Cool. I will have to try this tonight.

Try? You mean, use it tonight.

Okay, fine. I will use it tonight.

End of instructions. You may now open the survey.

Comic - Task 1 RB (Request a Book)

Prose - Task 2 SS (Summon Search)

Step-oriented - Task 3 OCS (Off Campus Sign In)

Study of Technical Documentation Comic Style

How to Request A Book

Shows users how to request a book from the VT library



Addison, the library catalog

New Search Request Save to My List Make Quick List Display MARC Record Another Search

RECORD NO b1436080 All University Libraries Search

Limit search to available items

Author Richardson, Samuel, 1689-1761.

Title The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.

Publication Info. London, New York, Oxford University Press, 1972.

Call Number PR3664 .H5 1972

Material type: BOOK

Location Call Number Status

Newman 3rd floor PR3664 .H5 1972 V. 1 AVAILABLE

Newman 3rd floor PR3664 .H5 1972 V. 2 AVAILABLE

Newman 3rd floor PR3664 .H5 1972 V. 3 AVAILABLE

External Links

Reviews and more

Find more information at the British Literature subject guide

Lookup author Richardson, Samuel, in Literature Resource Center

Search nearby libraries via WorldCat

Export citation to EndNote

Cite This Item

Use the virtual shelf browser

Full screen

Or use the green check mark Request button that is at the top of the book description page.

VirginiaTech University Libraries

Off Campus Sign In

Addison, the library catalog: Login to My Library Account

My Library Account Login

Please enter the following information:

Please enter your full name (Jane Smith)

Your name

Please enter your Hokie Passport ID number or library card barcode number

ID number

Submit

Having problems logging in?

- Verify you are entering the correct information. Often you can use just your last name. Check your ID number on your Hokie Passport or library card.
- New members of the university community (new students and recent hires) may not have been added to our system yet. Contact the Circulation Desk by email or phone (540) 231-4340 to verify your account status.

After you have clicked the Request button, log in to your My Library Account using your name and student number.

Addison, the library catalog: Request single item

Requesting The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.

Please choose where you would like to pick up this item (required):

Pickup Location (Choose a Pickup Location)

Enter any special notes for your request (optional):

Cancel request if not filled by:

Date: Month: Month Day: Day Year: Year

Default is 30 days. Requests from Storage are usually filled in two business days. Requests for checked out books will show the new due day after submitting. After submitting this screen, select the item from this list (there may be only one choice); then click Request Selected Item.

Submit

That takes you to the next step to request the book.

Addison, the library catalog: Request single item

Requesting The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.

Please choose where you would like to pick up this item (required):

Pickup Location (Choose a Pickup Location)

Choose a Pickup Location

Art Arch Library

Newman Library Circulation Desk

Ver Med Library

STAFF USE ONLY

BOOK RUNNER LOCATIONS

Amory

Breslin Center CRC

Cheatham 235

Cheatham 313

Cheatham 315

East So & Tech 118

302 College Sq-400 Turner St

Hollen 1005

Hallen North 306

Hutchinson 405A

Lane 115

Major Williams 115A

Major Williams 331C

Submit

Use the drop down menu to select your pick-up location. That can be one of the libraries, like in your case, or a Book Runner location.

Addison, the library catalog: Request single item

Requesting The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.

Please choose where you would like to pick up this item (required):

Pickup Location (Choose a Pickup Location)

Choose a Pickup Location

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Hallen North 306

Hutchinson 405A

Lane 115

Major Williams 115A

Major Williams 331C

Submit

You can see the list of Book Runner locations for participating departments below the main library options.

Addison, the library catalog: Request single item

Requesting The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.

Please choose where you would like to pick up this item (required):

Pickup Location (Choose a Pickup Location)

Choose a Pickup Location

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STAFF USE ONLY

BOOK RUNNER LOCATIONS

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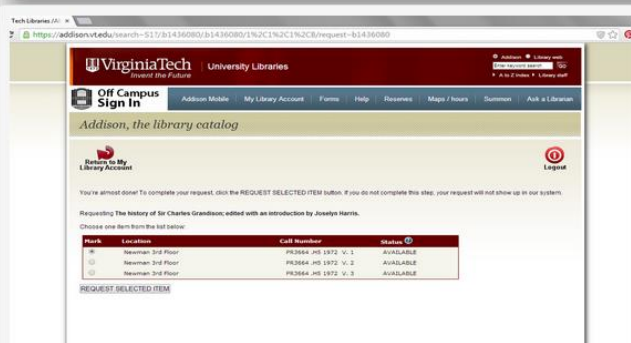
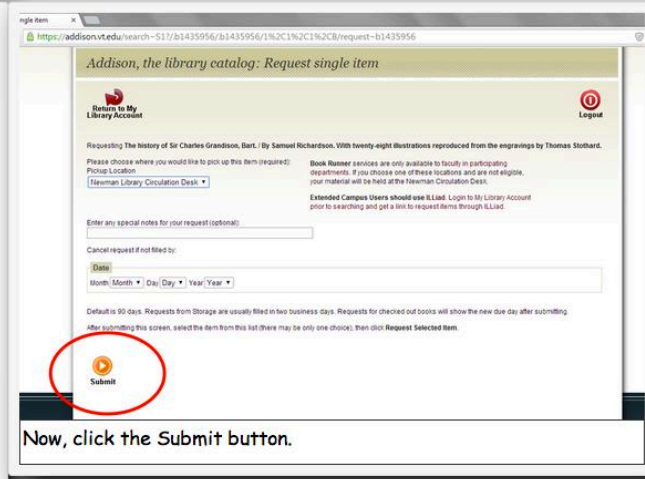
Lane 115

Major Williams 115A

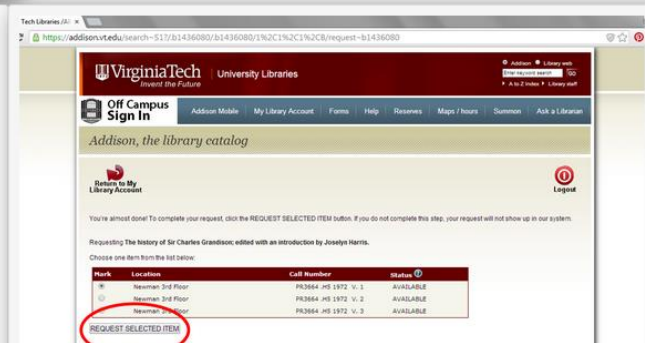
Major Williams 331C

Submit

The next two fields are optional. You can enter any special notes about the book request or a cancel request date. If the request is not filled by the selected date it will be cancelled automatically.



In the final request page you have to select the right volume if there are multiple books listed.





Record ID: b1435956

Author: Richardson, Samuel, 1689-1761.

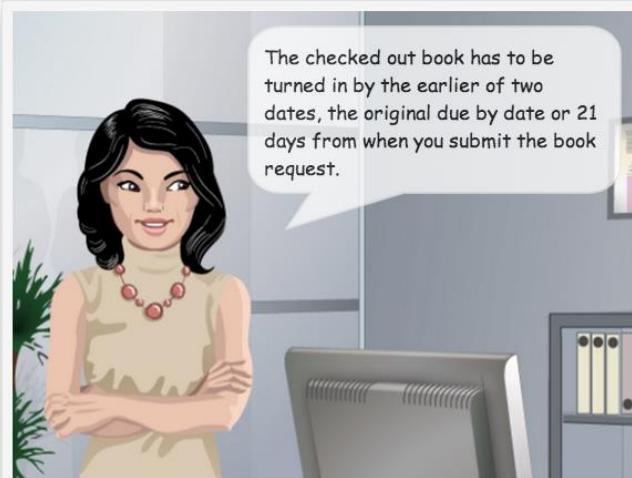
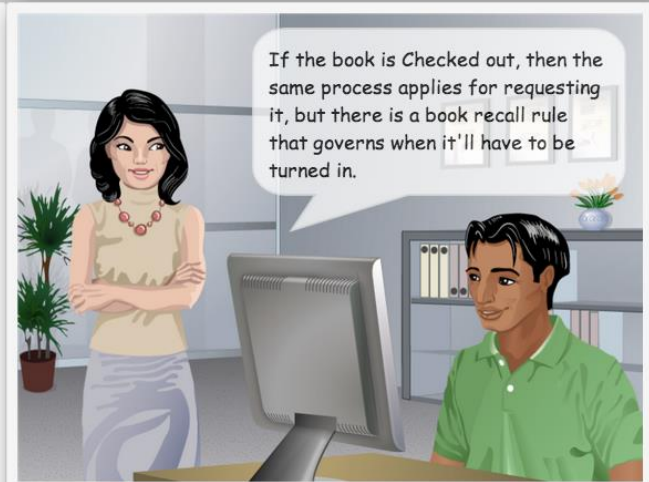
Title: The History of Sir Charles Grandison, Bart. / By Samuel Richardson. With twenty-eight illustrations reproduced from the engravings by Thomas Stothard.

Publication Info: London : Chapman & Hall, 1902.

Material type: Book

Location	Call Number	Status
Remote Storage Building	PR3664 .H5 1902 V. 1	AVAILABLE
Remote Storage Building	PR3664 .H5 1902 V. 2	AVAILABLE
Remote Storage Building	PR3664 .H5 1902 V. 3	AVAILABLE
Remote Storage Building	PR3664 .H5 1902 V. 4	AVAILABLE
Remote Storage Building	PR3664 .H5 1902 V. 5	AVAILABLE
Remote Storage Building	PR3664 .H5 1902 V. 6	AVAILABLE
Remote Storage Building	PR3664 .H5 1902 V. 7	AVAILABLE


If the book is in remote storage then the Location will say that.



Study: How-to Instructions x

dopey.cs.vt.edu/~mapq/study/index.php

Study: How-to Instructions Study instructions and then complete the survey. [Open the survey](#) [Continue to Task 2](#)



Not unless you just tell me what happens in the book.

Yeah, you can request it and find out yourself.

End of instructions. You may now open the survey.

Study: How-to Instructions x

dopey.cs.vt.edu/~mapq/study/index.php

Study: How-to Instructions

Study instructions and then complete the survey.

Open the survey

Continue to Task 3

Study of Technical Documentation Prose Style

Summon Help

A default search in *Summon* is a keyword search against the items we have local access to: all the records in Addison, the library catalog, articles from journals to which we subscribe, content from participating databases to which we subscribe, and freely available content such as from open access journals or government websites.

A simple search of one or two words will return over a million results: use phrase searching, field searching, and facets to refine your search and return fewer results.

Use the *Include results from outside your library's collection* option to include records from other libraries's catalogs, articles from journals to which we don't have subscriptions, and records from databases to which we don't subscribe. You can request most of these items via [interlibrary loan](#).

Phrase searching

Summon allows for phrase searching with the use of quotes. The query "local food" will find results with that phrase.

Searching specific fields

The single search box in Summon (basic search box or keyword search box in advanced search) will search across many fields automatically. For example, entering an ISBN or ISSN will bring back associated records.

You can explicitly search a field using the syntax: "field:(query)." For example, the search ISSN:(1234-5678), finds records that contain that value in the ISSN field.

Searchable fields:

- Title
- SubjectTerms
- Author
- Publisher
- PublicationTitle
- Volume
- Issue
- Language
- Notes
- ISBN
- ISSN
- DOI

Boolean operators

Summon offers the following Boolean operations: OR, NOT and AND. The operators must be written in ALL CAPS.

By default, all terms in a search are combined with the AND operator. To expand the results set, use the OR operator "microcircuits OR nanocircuits" will return items that contain either term.

This can be combined with quoted terms such as "local food" OR "sustainable eating".

To exclude items in Summon, use the NOT operator or "-" character before a term. When used in the following query "animal NOT dog" the results will not include the term "dog".

Proximity operators

To perform a *proximity* search, enclose your search terms in quotes and use the tilde (~) followed by a number indicating the distance you want to allow between the search terms.

For example:

"yeast bread"~10

finds material where "yeast" and "bread" appear within 10 words of each other.

NOTE: *proximity* searching does not take the order of search terms into account. A search on "boron nanotubes potassium"~6 will yield results in which the three search terms appear in various orders.

Wildcards

Searches within Summon can be performed using the wildcards ? and *.

The question mark (?) will match any one character and can be used to find "Olsen" or "Olson" by searching for "Ols?n".

The asterisk (*) will match zero or more characters within a word or at the end of a word. A search for "Ch*ter" would match "Charter", "Character", and "Chapter". When used at the end of a word, such as "Temp*", it will match all suffixes "Temptation", "Temple" and "Temporary".

Wildcards cannot be used as the first character of a search.

Use the tilde (~) character at the end of a word to match similar terms. When used on the term "Lead~" it will match "Wead", "Veade", and "Tead".

Study: How-to Instructions

dopey.cs.vt.edu/~mapq/study/index.php

Study: How-to Instructions

Study instructions and then complete the survey.

Open the survey

Continue to Task 3

the end of a word, such as "Temp*", it will match all suffixes "Temptation", "Temple" and "Temporary".

Wildcards cannot be used as the first character of a search.

Use the tilde (~) character at the end of a word to match similar terms. When used on the term "Lead~" it will match "Wead", "Veade", and "Tead".

Scholarly publications limit

When you turn on the *Limit to articles from scholarly publications, including peer-review* option, you will limit your search results to articles from peer-reviewed journals. (Note that books from academic and university publishers are often considered "scholarly," but this option eliminates all books from your results.) This option uses data from [UlrichsWeb - Ulrich's Periodical Directory](#), which identifies scholarly and peer-reviewed journals, and is our preferred source of this information when you need to manually verify a journal or article citation as being scholarly.

Facets

Summon uses a variety of *facets* to limit and refine search results, much like Amazon and database providers like ESBCOhost. Each time you turn a facet on or off, your search is repeated and you'll see a new set of results. Most facets will reduce the number of search results (*Include results from outside your library's collection* will always increase the number of results.) Use the *more* link beneath a set of facets to see additional choices (these are typically listed in order of the number of results) and to use an *exclude facet* option in addition to the default *include* option. See our Facets page for details on each facet set.

Browser support

Summon supports the following browsers and phones:

- Internet Explorer 6.0+
- Firefox 3.0+
- Safari 4.0+
- Chrome 7.0+
- iPhone 2.0+
- BlackBerry 8500+
- Android 1.0+

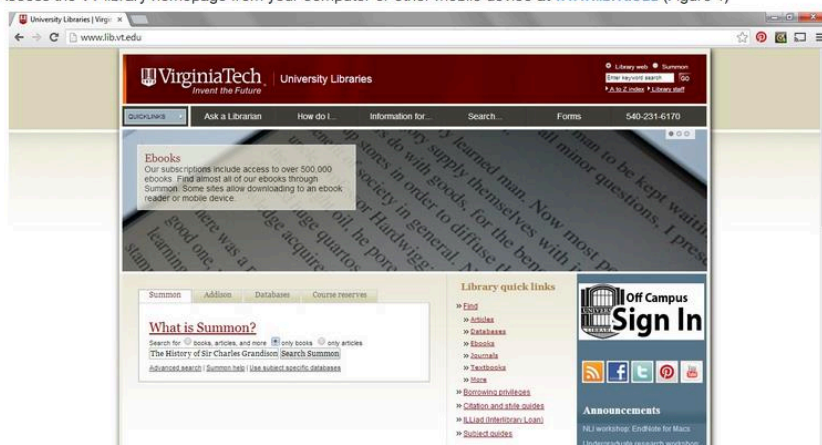
End of instructions. You may now open the survey.

Study of Technical Documentation Step-oriented Style

How to use the Virginia Tech Library's Off Campus Sign In feature

Off Campus Sign In is an authentication system that you must use in order to gain access to some of the Library's restricted resources when you are not connected to the VT network. You must sign in with your PID and password to show that you are affiliated with VT to be granted access to databases, ebooks, ejournals, and selected VT electronic theses and dissertations. You must be a current or retired VT faculty or staff member or a currently enrolled VT student registered in degree or credit courses with VT to have access to all of these resources.

1. Access the VT library homepage from your computer or other mobile device at www.lib.vt.edu (Figure 1)



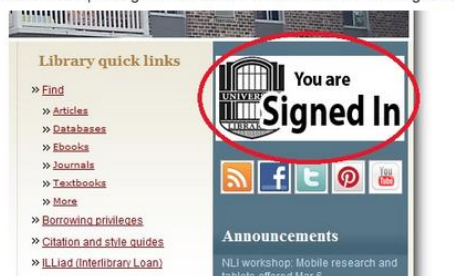
Home page for the Virginia Tech library.

2. Locate the white box that says Off Campus Sign In and click on it. (Figure 2)



The Off Campus Sign In button.

3. Now, enter your PID and password to gain access to all Virginia Tech resources.
4. The Off Campus Sign In button should now read You are signed in. (Figure 3)



You are Signed In.

Important: If this does not happen, you have not been signed in and cannot access restricted resources. You have likely been disconnected and you will need to try signing in again.

Tip: Also, you can check the URL to make sure you are signed in if you cannot tell from the webpage. The Off Campus Sign In links will contain the string ezproxy.lib.vt.edu in the URL.

5. Once you are signed in, navigate to restricted resources through this browser window.

Attention: If you just navigate to the resources in another browser window, then the Off Campus Sign In service will not work.

End of instructions. You may now open the survey.

Step-oriented - Task 1 RB (Request a Book)

Comic - Task 2 SS (Summon Search)

Prose - Task 3 OCS (Off Campus Sign In)

Study of Technical Documentation Step-oriented Style

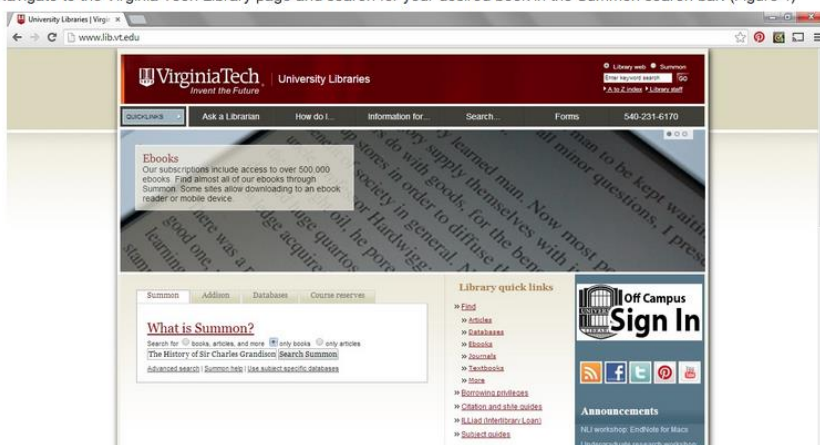
How to check out books from the Virginia Tech Library

- [How to request an available book from the Virginia Tech Library](#)
- [How to request a checked out book from the Virginia Tech Library](#)
- [How to request a book from the Virginia Tech Library's remote storage](#)

How to request an available book from the Virginia Tech Library

The Virginia Tech Library offers many different resources including books, journals, and databases. Available sources are easiest to access, and can be requested via the library website.

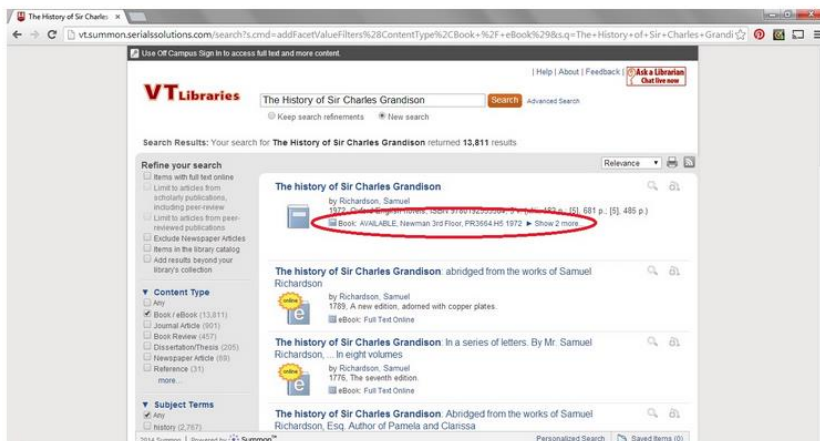
1. Navigate to the Virginia Tech Library page and search for your desired book in the Summon search bar. (Figure 1)



Home page for the Virginia Tech library.

2. Once results appear, locate the desired book and check its availability. (Figure 2)

Note: If available, under the title and description of the book, you will see **Available** and the location of the book.



Availability and location of a book.

3. Click on the title of your desired book.

Tip: You can also check the availability of a book with its location and call number. (Figure 3)



Subject Terms
Any
The history of Sir Charles Grandison: Abridged from the works of Samuel Richardson, Esq. Author of Pamela and Clarissa
2014 Summon | Powered by iX Summon™
Personalized Search Saved Items (0)

Availability and location of a book.

- Click on the title of your desired book.

Tip: You can also check the availability of a book with its location and call number. (Figure 3)

Author	Richardson, Samuel, 1689-1761.		
Title	The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.		
Publication Info.	London, New York, Oxford University Press, 1972.		
Call Number	PR3664 .H5 1972		
Material type	BOOK		

Location	Call Number	Status
Newman 3rd Floor	PR3664 .H5 1972 V. 1	AVAILABLE
Newman 3rd Floor	PR3664 .H5 1972 V. 2	AVAILABLE
Newman 3rd Floor	PR3664 .H5 1972 V. 3	AVAILABLE

Available book status.

- At the top of the screen, click the green check mark to proceed with the request process. (Figure 4)

Tip: You may also view the location of the book in the library and pick it up yourself by checking out at the circulation desk.

Green check button above the book information.

- Log in with your name and student ID number.
Do not use your PID or password in this window
- Choose your pickup location. (Figure 5)

Tip: At this time, you may choose to use the Book Runner service for participating departments.

Choose where to pickup your book.

- Optional: Enter any special notes for your request and choose a date to cancel your request if you do not pick the book up.

Note: The default cancellation is 90 days from the date of request.

- Click submit at the bottom of the page.

Study: How-to Instructions

Study instructions and then complete the survey.

[Open the survey](#)

[Continue to Task 2](#)

8. Click submit at the bottom of the page.
9. If applicable, select the appropriate volume from the multiple choice list before final submission.
 - a. Click submit to complete your request. (Figure 6)

You're almost done! To complete your request, click the REQUEST SELECTED ITEM button. If you do not complete this step, your request

Requesting *The history of Sir Charles Grandison; edited with an introduction by Joselyn Harris.*

Choose one item from the list below:

Mark	Location	Call Number	Status
<input checked="" type="radio"/>	Newman 3rd Floor	PR3664 .H5 1972 V. 1	AVAILABLE
<input type="radio"/>	Newman 3rd Floor	PR3664 .H5 1972 V. 2	AVAILABLE
<input type="radio"/>	Newman 3rd Floor	PR3664 .H5 1972 V. 3	AVAILABLE

[REQUEST SELECTED ITEM](#)

If applicable, choose the volume from the list.

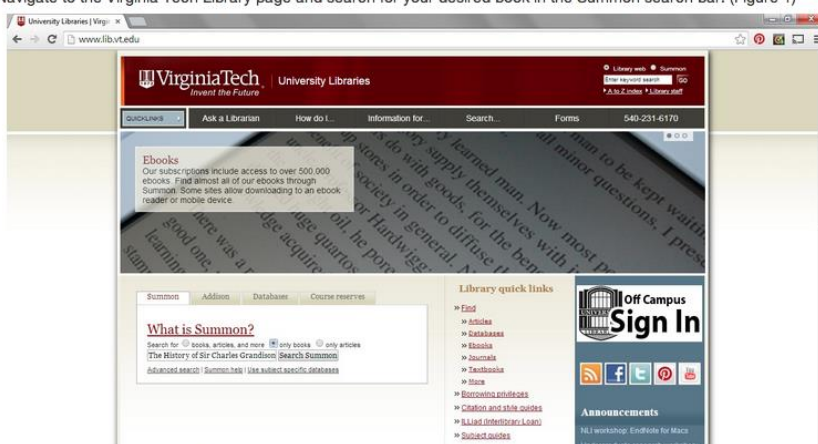
10. Check your My Library account for a status update on your request.

Note: On holdshelf means that your requested item is probably waiting for you at your chosen pickup location.

How to request a checked out book from the Virginia Tech Library

The Virginia Tech Library ensures that resources like journals and books are made available to anyone who requires the information. Resources that have been checked out can still be requested and made available to those who need them.

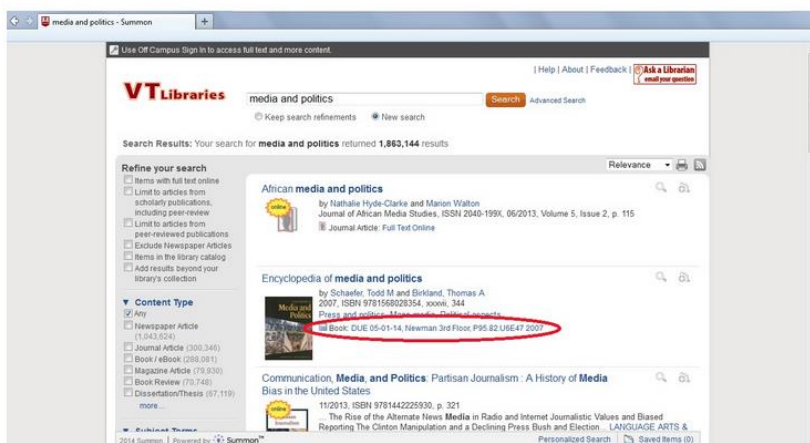
1. Navigate to the Virginia Tech Library page and search for your desired book in the Summon search bar. (Figure 1)



Home page for the Virginia Tech Library.

2. Once results appear, locate the desired book and check its availability. (Figure 2)

Note: If it is checked out, under the title and description of the book, you will see DUE and the date it is due back to the library.



Availability and location of a book.

3. Click on the title of your desired book.

Tip: You can also check the availability or due date of the book with its location and call number. (Figure 3)



Availability and location of a book.

- Click on the title of your desired book.

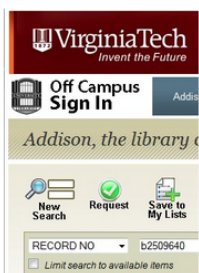
Tip: You can also check the availability or due date of the book with its location and call number. (Figure 3)

Title	Encyclopedia of media and politics / edited by Todd M. Schaefer, Thomas A. Birkland.	
Publication Info.	Washington, D.C. : CQ Press, c2007.	
Call Number	P95.82.U6 E47 2007	
Material type	BOOK	
Location	Call Number	Status
Newman 3rd Floor See map	P95.82.U6 E47 2007	DUE 05-01-14

Book with due status.

- At the top of the screen, click the green check mark to proceed with the request process. (Figure 4)

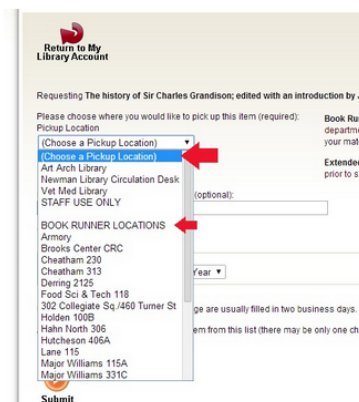
Tip: You may also view the location of the book in the library and pick it up yourself by checking out at the circulation desk.



Green check button above the book information.

- Log in with your name and student ID number.
- Choose your pickup location. (Figure 5)

Tip: At this time, you may choose to use the Book Runner service for participating departments.



Choose where to pickup your book.

- Optional:** Enter any special notes for your request and choose a date to cancel your request if you do not pick the book up.

Note: The default cancellation is 90 days from the date of request.

Choose where to pickup your book.

7. **Optional:** Enter any special notes for your request and choose a date to cancel your request if you do not pick the book up.

Note: The default cancellation is 90 days from the date of request.

8. Click submit at the bottom of the page.
9. Click submit to complete your request of the selected item
 - a. If applicable, select the appropriate volume from the multiple choice list before final submission.

Important: Recalled items are due back 21 days from the date of the submitted request or by the due date, whichever comes first.

You're almost done! To complete your request, click the REQUEST SELECTED ITEM button. If you do not complete this step, your request will not show.

Requesting Encyclopedia of media and politics / edited by Todd M. Schaefer, Thomas A. Birkland.

Choose one item from the list below:

Mark	Location	Call Number	Status
<input type="radio"/>	Newman 3rd Floor	P95.82.U6 E47 2007	DUE 05-01-14

REQUEST SELECTED ITEM

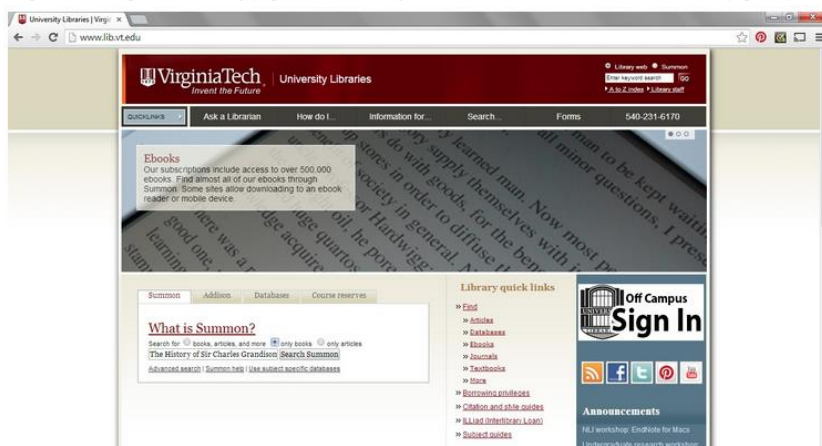
If applicable, choose the volume from the list.

10. Check your My Library Account for a status update on your request, c

Note: On Holdshelf means that your requested item is probably waiting for you at your chosen pickup location.

How to request a book from the Virginia Tech Library's remote storage

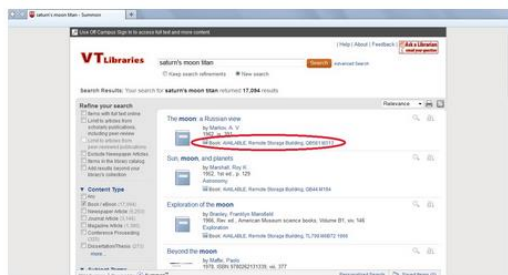
1. Navigate to the Virginia Tech library page and search for your desired book in the Summon search bar. (Figure 1)



Home page for the Virginia Tech Library.

2. Once results appear, locate your desired book and check its location and availability. (Figure 2)

Note: If an item is in Remote Storage, it will say **available** under status, and for the location it will say **Remote Storage Building**.



Book in remote storage.

3. Click on the title of your desired book.

Tip: You can also check the availability and location of a book with its the call number. (Figure 3)

Author	Markov, A. V. (Aleksandr Vladimirovich), 1897-
Uniform Title	Luna. English
Title	The moon; a Russian view. [Translated from the Russian by Roger and Roger, inc.
Publication Info.	Chicago] University of Chicago Press [1962]
Call Number	QB581 .M313
Material type	BOOK

Study: How-to Instructions

Study instructions and then complete the survey. [Open the survey](#) [Continue to Task 2](#)

Book in remote storage.

3. Click on the title of your desired book.

Tip: You can also check the availability and location of a book with its call number. (Figure 3)

Author	Markov, A. V. (Aleksandr Vladimirovich), 1897-		
Uniform Title	Luna. English		
Title	The moon; a Russian view. [Translated from the Russian by Roger and Roger, inc.		
Publication Info.	Chicago] University of Chicago Press [1962]		
Call Number	QB581 .M313		
Material type	BOOK		
Location	Call Number	Status	
Remote Storage Building See map	QB581 .M313	AVAILABLE	

Book available in remote storage.

4. At the top of the screen, click the green check mark to proceed with the request process. (Figure 4)

Tip: You may also view the location of the book in the library and pick it up yourself by checking out at the circulation desk.

Green check button above the book information.

5. Log in with your name and student ID number.

6. Choose your pickup location. (Figure 5)

Tip: At this time, you may choose to use the Book Runner service for participating departments.

Choose where to pickup your book.

7. **Optional:** Enter any special notes for your request and choose a date to cancel your request if you do not pick the book up.

Note: The default cancellation is 90 days from the date of request.

8. Click submit at the bottom of the page.

Study: How-to Instructions

Study instructions and then complete the survey.

Open the survey

Continue to Task 2

302 Collegiate Sq./460 Turner St
Holden 100B
Hahn North 306
Hutcherson 406A
Lane 115
Major Williams 115A
Major Williams 331C

Submit

ge are usually filled in two business days. f
em from this list (there may be only one ch

Choose where to pickup your book.

7. **Optional:** Enter any special notes for your request and choose a date to cancel your request if you do not pick the book up.

Note: The default cancellation is 90 days from the date of request.

8. Click submit at the bottom of the page.

9. If applicable, select the appropriate volume from the multiple choice list before final submission.

a. Click submit to complete your request of the selected item. (Figure 6)

You're almost done! To complete your request, click the REQUEST SELECTED ITEM button. If you do not complete this step, your request w

Requesting *The moon; a Russian view.* [Translated from the Russian by Roger and Roger, inc.

Choose one item from the list below.

Mark	Location	Call Number	Status
<input checked="" type="radio"/>	Remote Storage Building	QB581 .M313	AVAILABLE

REQUEST SELECTED ITEM

If applicable, choose the volume from the list.

10. For a status update on your request, check your My Library Account.

Note: **On Holdshelf** means that your requested item is probably waiting for you at your chosen pickup location.

End of instructions. You may now open the survey.

Study of Technical Documentation Comic Style

How to Search Summon

Shows users how to search the VT Library's Summon database



Study: How-to Instructions

Study instructions and then complete the survey. [Open the survey](#) [Continue to Task 3](#)

...content from the journals and databases VT subscribes to, and freely available content from open access journals and government websites...

Okay, I got it. Basically, everything VT has access to, local or remotely.

Maybe my search terms aren't working?

Let me have a look.

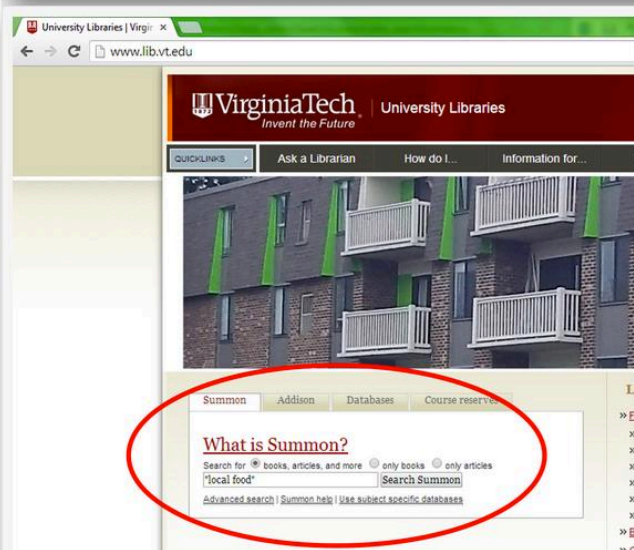
It's not that they aren't working, you just aren't being very specific.

So, you're saying I just need to refine my search better.

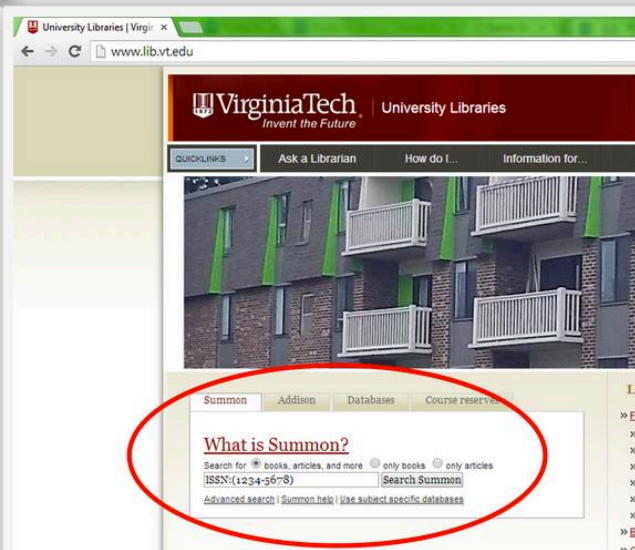
Yep. That's how you get better results.

What is Summon?
Search for books, articles, and more. [Only books](#) [Only articles](#)
[The History of Sir Charles Grandison](#) [Search Summon](#)
[Advanced search](#) / [Summon help](#) / [Use subject-specific databases](#)

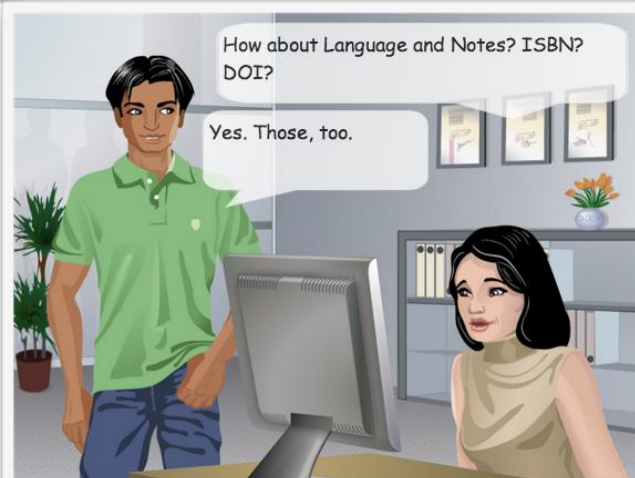
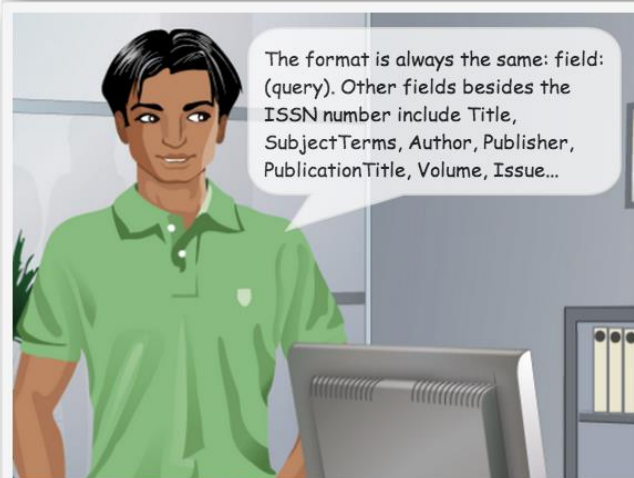
The default search is just a keyword search. That simple search with just a couple of terms can return over a million results.

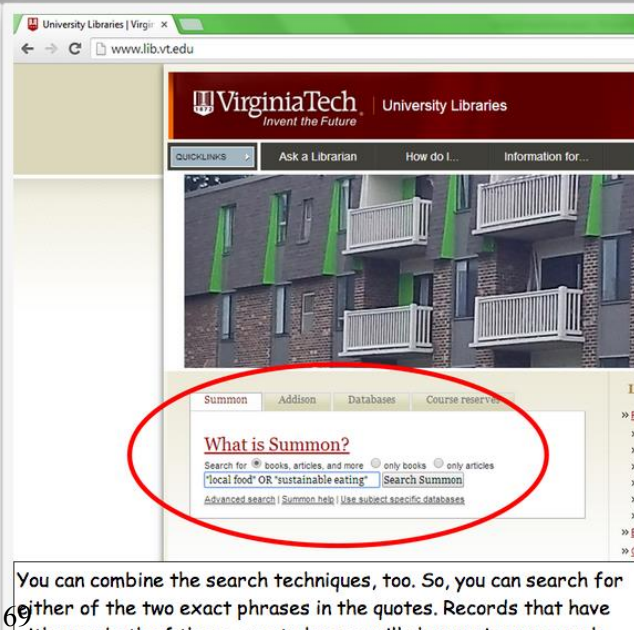
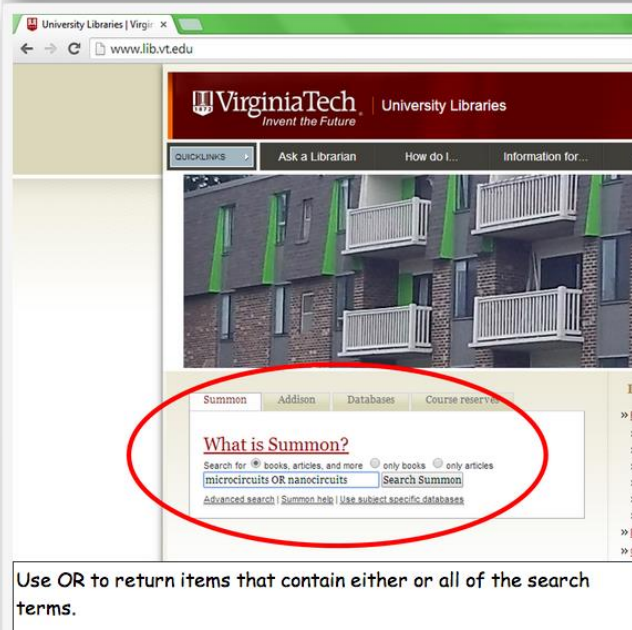
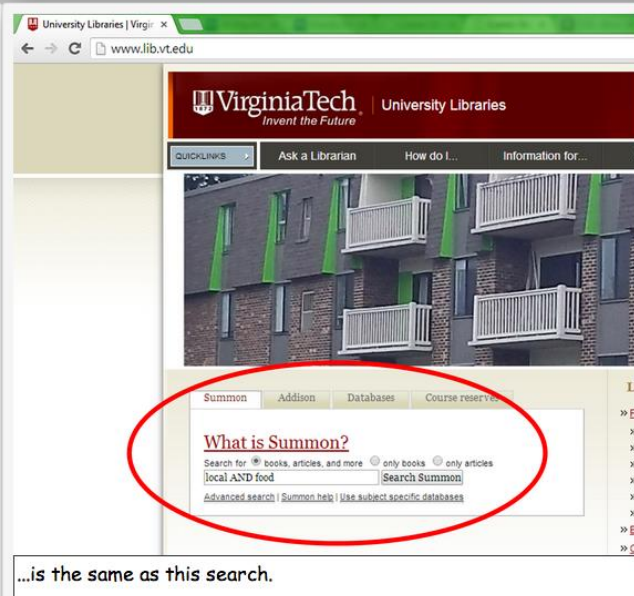
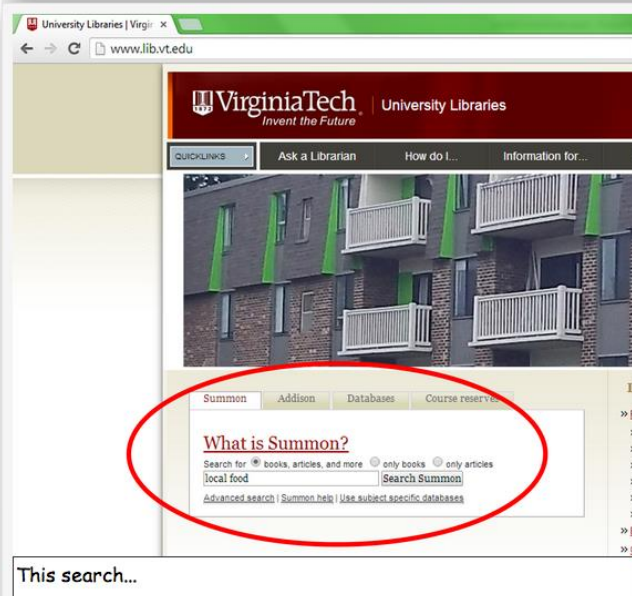
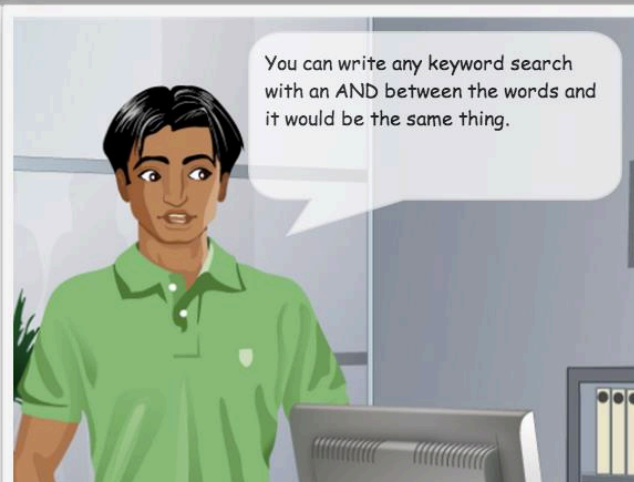


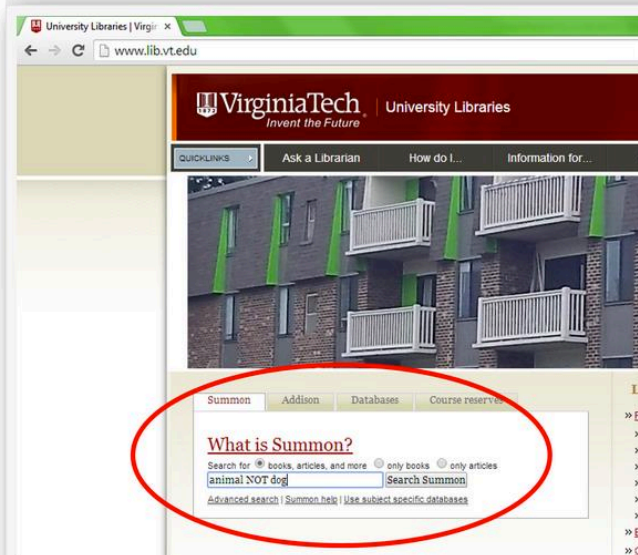
For example, you can use a phrase search to look for an exact phrase match. The query here will find results with the exact words, "local food." It won't return extra results that just contain "food" somewhere and "local" somewhere else.



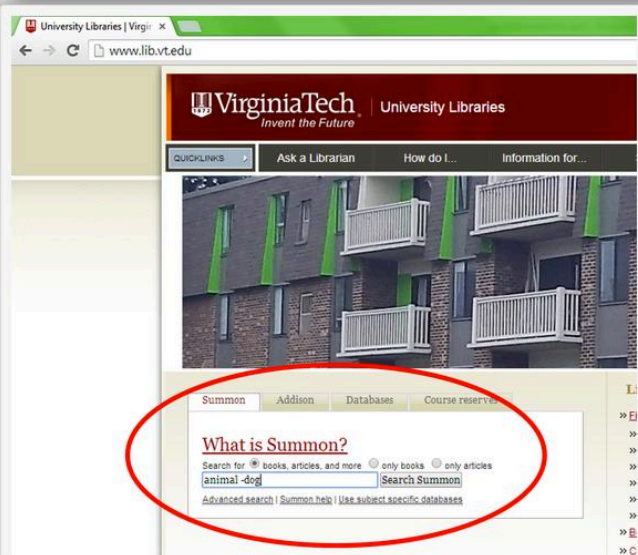
You can write a field search to look for a phrase or word only in a specific field. Like this one, which searches for the given query, 1234-5678, in just the ISSN field.



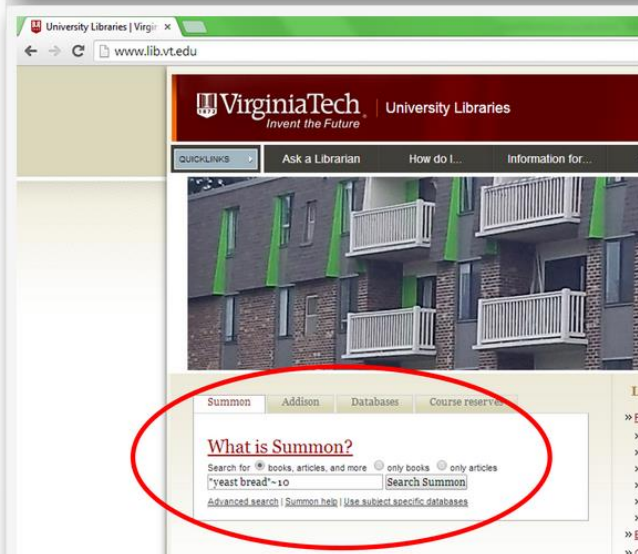
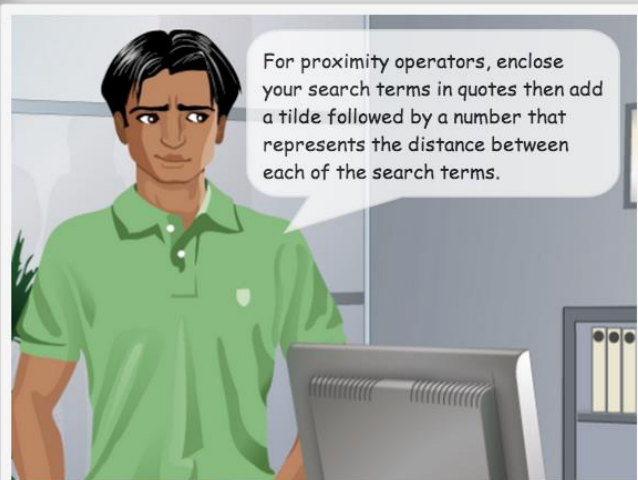




The NOT operator is fun. It has two options. You can use the NOT in all caps like the other Boolean operators or you can use the minus sign.

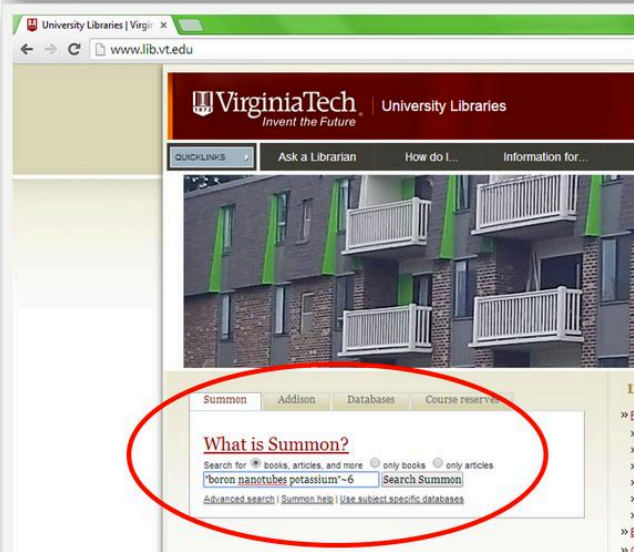


The minus sign looks like this. Only results that include the term "animal," but do not include the term "dog" will show up.

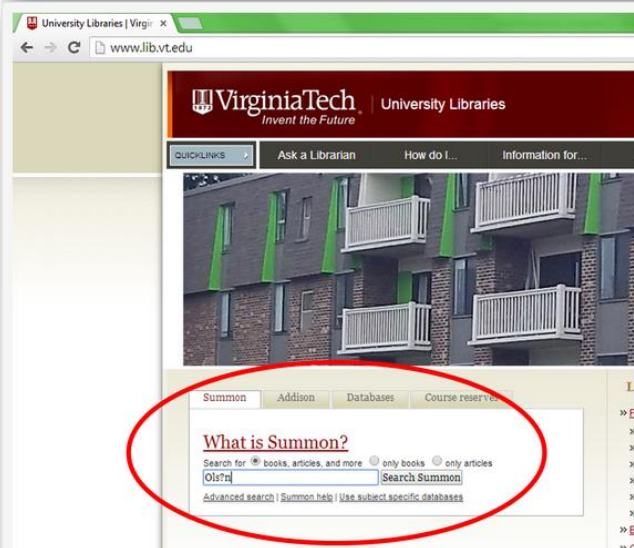
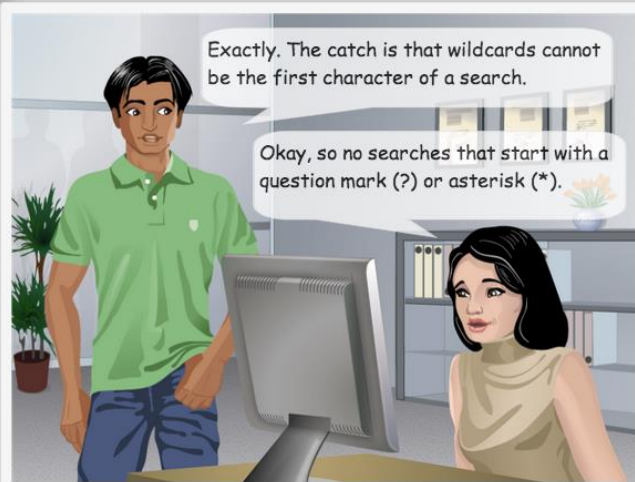


For this one, results will all contain the search term "yeast" within 10 words of the search term "bread."

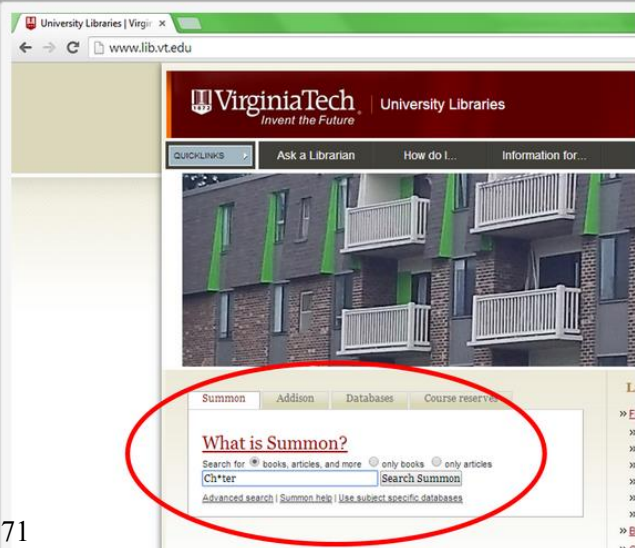




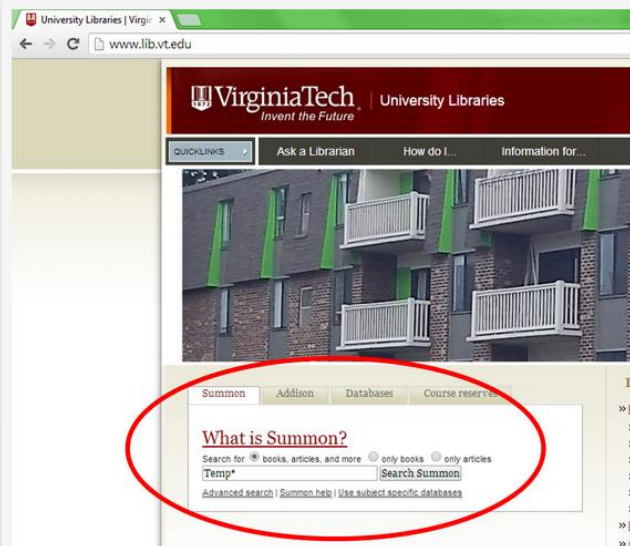
Yes, even though the search terms are in quotes here, the proximity search does not take word order into account. So this search will yield results in which all three of these words will appear within 6 words of each other, regardless of their order.



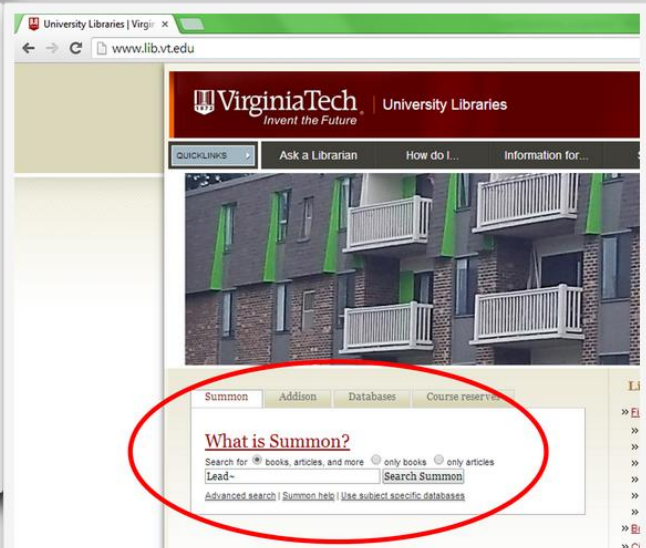
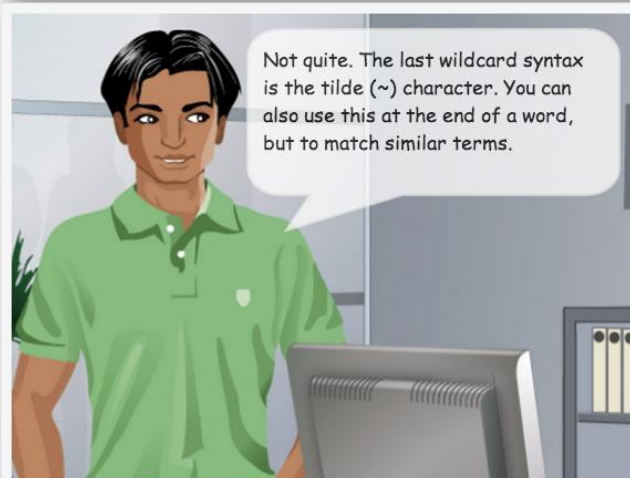
The question mark (?) will match any one character. This search would match "Olsen" or "Olson."



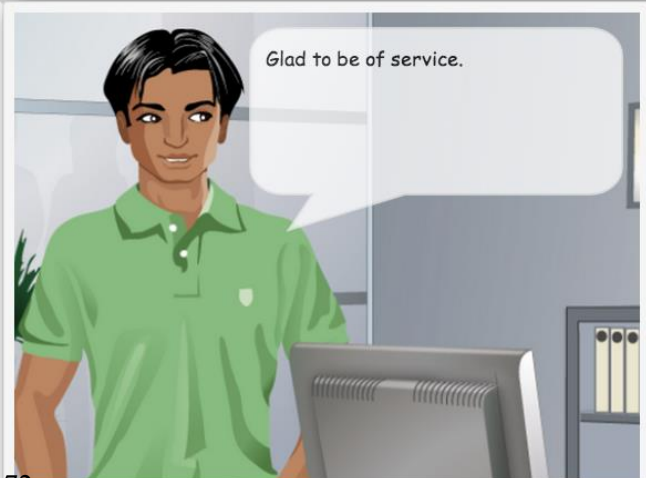
The asterisk (*) is even more broad. It can match zero or more characters. This search would match "Charter," "Character," and "Chapter."



When used at the end, the asterisk (*) will match all suffixes, including "Temptation," "Temple," and "Temporary."



This search matches "Wead," "Veade," and "Tead!"



Study: How-to Instructions x
dopey.cs.vt.edu/~mapq/study/index.php
Study: How-to Instructions
Study instructions and then complete the survey.
Open the survey
Complete Post-questionnaire

Study of Technical Documentation Prose Style

About Off Campus Sign In

Some of the Library's resources—[databases](#), [ebooks](#), [ejournals](#), and selected Virginia Tech [electronic theses and dissertations](#) - are restricted to currently employed faculty/staff, currently enrolled students registered in degree or credit courses, and retirees.



Users on the campus network (wired or wireless, including users on the Blacksburg campus, extended campuses, and the [VPN](#)) are automatically recognized by the providers of these resources as being part of the Virginia Tech community.

Users outside the campus network who access the Internet through a commercial ISP, their cellular network, a company's free wireless, or through their business or school network would not be recognized as being affiliated with Virginia Tech and thus must go through an extra step to gain that recognition.

You are authenticated through a system called *Off Campus Sign In* that prompts you to enter your Virginia Tech PID and password. It then authorizes you if you are a current student, faculty, or staff member.

Off Campus Sign In access

1. Use the [Off Campus Sign In](#) button on any library page, enter your Virginia Tech PID and password, then hit the *Submit* button. If you get a blank screen or an error screen immediately after clicking the button, or after submitting your PID and password, use our [Off Campus Sign In Frequently Asked Questions](#) page which lists potential solutions to these errors.
2. Authorized users will then pass through to the library page, where restricted resources can be accessed. The *Off Campus Sign In* button will now display *You Are Signed In*, to indicate you have been authenticated. If this button changes back to *Off Campus Sign In*, you have somehow been disconnected from the service and will need to sign in again.
3. The links to restricted resources will look different than the on-campus direct links. Proxied links include the string [ezproxy.lib.vt.edu](#) in the URL. If you do not see this URL pattern when you attempt to access a database, ebook, or ejournal, you have been disconnected from the service and will need to sign in again.

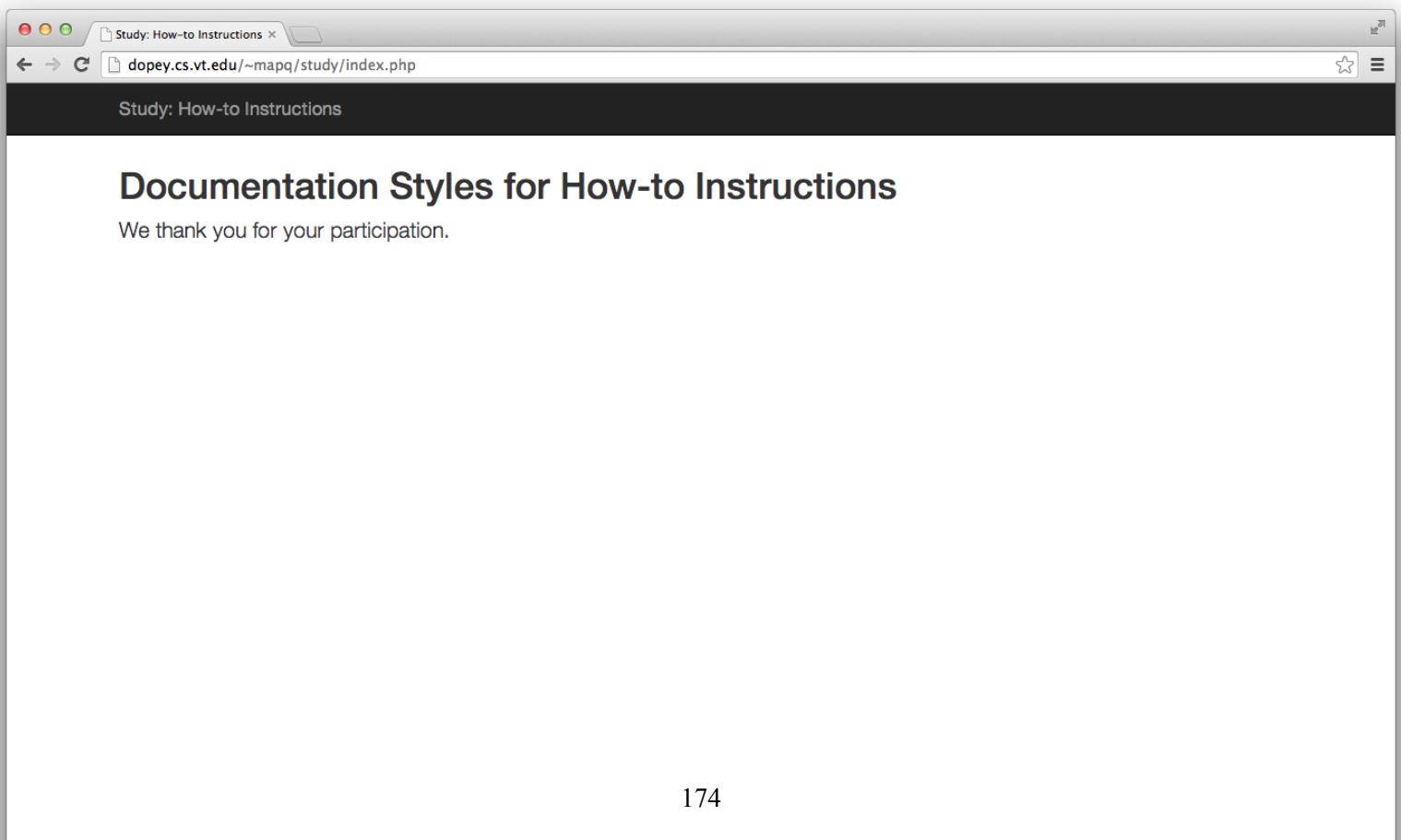
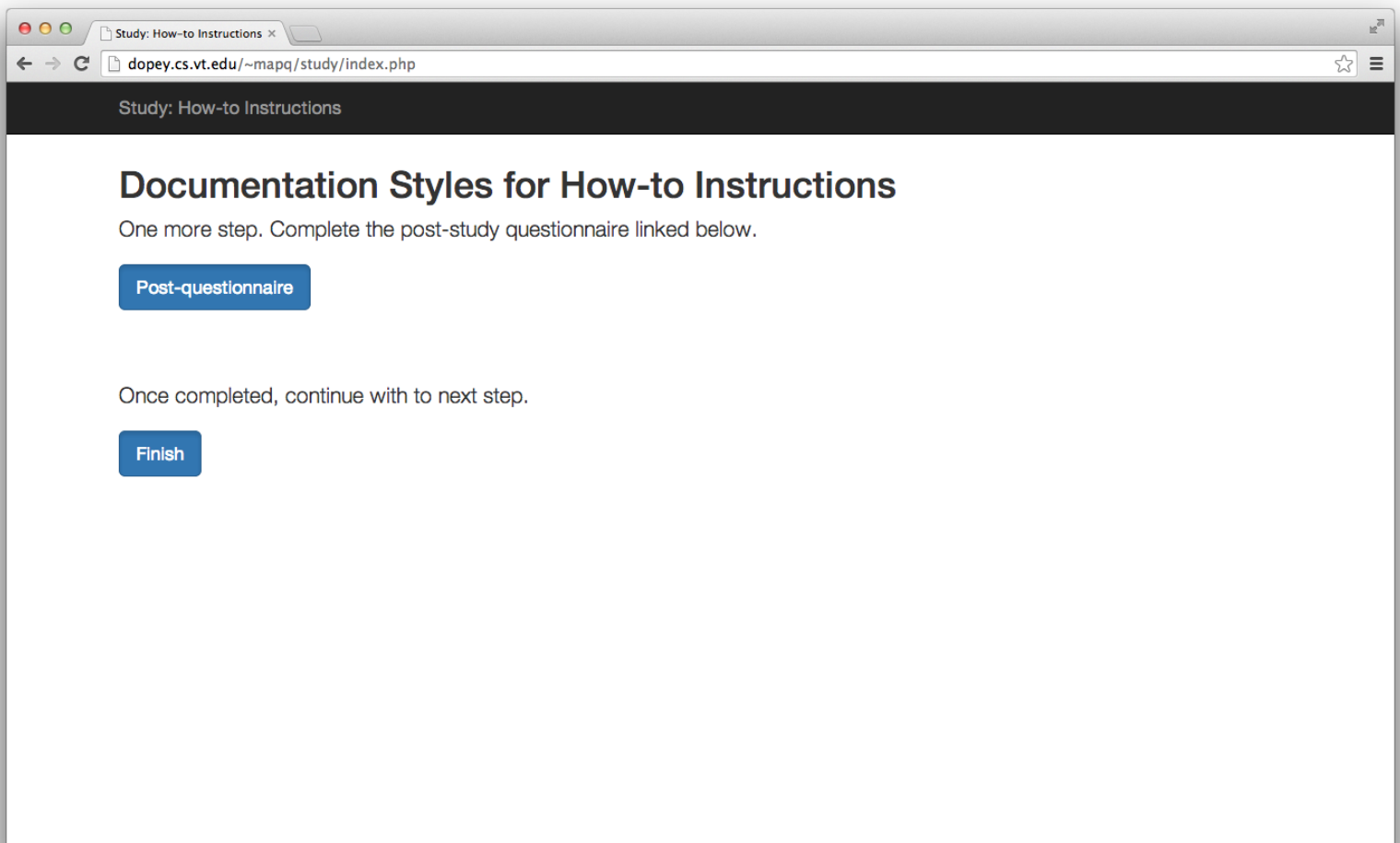
LibX proxy shortcut

[LibX](#) is a browser extension that can make reconnecting to a resource via Off Campus Sign In much easier. If you have reached a restricted resource, such as a database or ejournal, but forgot to use Off Campus Sign In first, and thus are not able to access the resource, a simple right-click on the page will bring up a menu including a **Reload via Off Campus Sign In** option. Simply log in and the page you were trying to access will now work.

Problems with Off Campus Sign In access

See the [Off Campus Sign In Frequently Asked Questions](#) if you have any problems using the service.

End of instructions. You may now open the survey.



Pre Questionnaire and Consent Survey



Block 1

Project: Documentation Styles for How-To Instructions

Experiment Time: Approximately 1 hour

Investigators: Rebecca Zeitz razeitz@vt.edu
 Rebecka Huey bk1025@vt.edu
 Dr. Manuel Pérez-Quiñones
 perez@cs.vt.edu
 Dr. Carlos Evia Puerto cevia@vt.edu

Data collected during this study will contribute knowledge of how-to documentation formatting and styles. All data will be confidential. Only unique subject identifiers, not personally identifiable information, will be used in analysis and reports.

You will be asked to complete a pre-questionnaire asking basic demographic and background information. You will be presented with three short how-to documents for questions and document evaluation. After, you will be asked to complete a post-questionnaire on your experience.

There are no more risks associated with this study than everyday tasking and reading on a computer. However, if you feel unable to complete the study, you may withdraw at any time and you will still receive full credit if signed up for participation through the Psychology SONA or other research participation system.

This research has been approved by the Institutional Review Board for projects involving human subjects at Virginia Polytechnic Institute and State University and the Department of Computer Science.

Virginia Tech Institutional Review Board Project No. 14-102
Approved February 19, 2014

By accepting this, I acknowledge that I am 18 years of age or older and voluntarily agree to participate in this study. I have read and understand the

informed consent and conditions of this research. If I have had any questions about this form or the study, I have asked them and received answers and/or clarification. I hereby acknowledge the above and give my voluntary consent for participation in this project. I agree to abide by the rules of this project.

☐ Accept

☐ Decline

Default Question Block

Please enter your:

3 digit Participant ID:

Gender:

☐ Male

☐ Female

☐ Other

Age:

Major:

Second Major (if applicable):

Minor (if applicable):

Nationality:

Student Status:

Undergraduate
☐

Graduate
☐

Not a Student
☐

Year:

Freshman
☐

Sophomore
☐

Junior
☐

Senior
☐

5th year
☐

Degree seeking:

MS
☐

PhD
☐

Year of Study:

What is your profession/job?

Do you regularly WRITE how-to documentation?

- ☐ Yes
- ☐ No

To what extent do you WRITE how-to documentation?

- ☐ Daily
- ☐ 5-6 times a week
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-3 times a month

Please describe the type of how-to documentation you WRITE:

Do you regularly EVALUATE how-to documentation?

- ☐ Yes
- ☐ No

To what extent do you EVALUATE how-to documentation?

- ☐ Daily
- ☐ 5-6 times a week
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-3 times a month

Please describe the type of how-to documentation you EVALUATE:

Do you regularly USE how-to documentation?

- ☐ Yes
- ☐ No

To what extent do you USE how-to documentation?

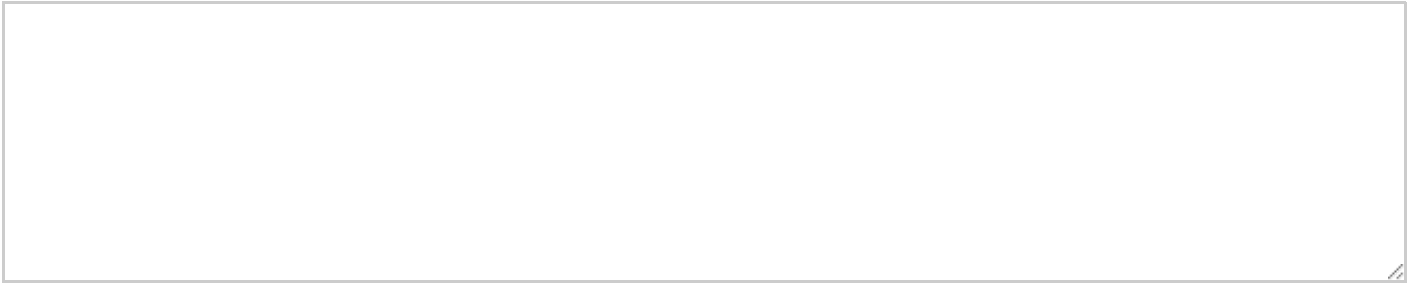
- ☐ Daily
- ☐ 5-6 times a week
- ☐

3-4 times a week

☐ 1-2 times a week

☐ 1-3 times a month

Please describe the type of how-to documentation you USE:



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Task 1 RB Survey

Block 1

Task 1: How to Request a Book

Thank you for reading the how-to documentation. Next, please answer the following questions. You may refer back to the documentation while completing this survey.

Please enter your 3 digit Participant ID:

For questions 1-6 answer True or False.

1. If a book is currently available at Newman library, you must request the book using the online request button.

- ☐ True
- ☐ False

2. Under certain circumstances, you might have to return a book back to the library before the due date.

- ☐ True
- ☐ False

3. You only need to enter your name and ID number to request a book from remote storage.

- ☐ True
- ☐ False

4. The book runner service is available for any on campus department office registered for the service.

- ☐ True
- ☐ False

5. All books that are available at the library will be ready for immediate pick-up.

- ☐ True
- ☐ False

6. You cannot request a book if it is in remote storage.

- ☐ True
- ☐ False

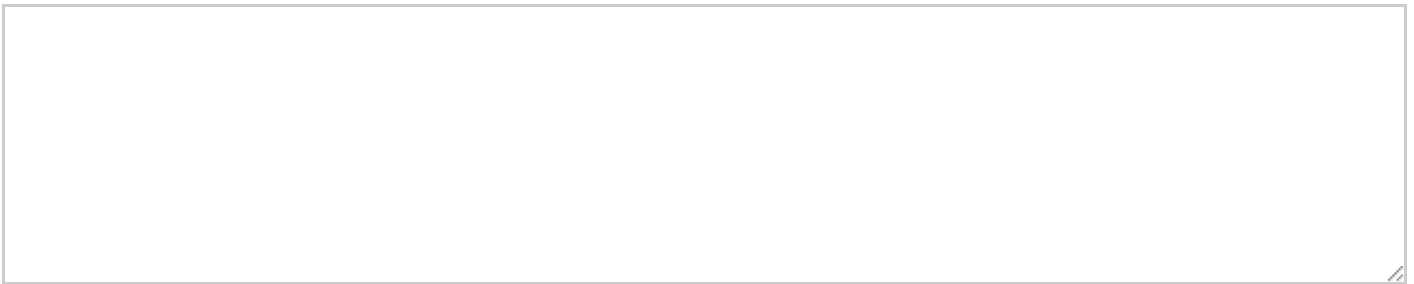
For questions 7-11 answer in complete and clear phrases or sentences.

7. Where do you go to check the status of your request?

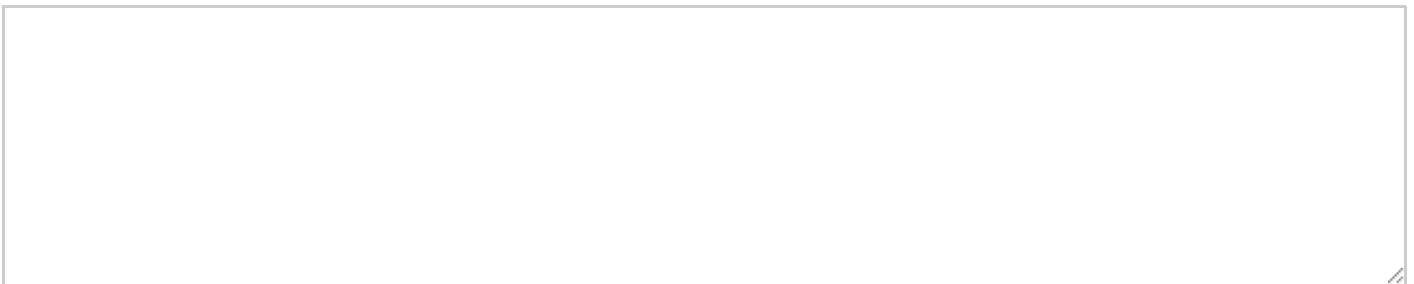
8. Where can you have a book delivered when it is requested from remote storage?

A large, empty rectangular box with a thin gray border, intended for the user to write the answer to question 8. A small diagonal line is visible in the bottom right corner of the box.

9. What is the status when a book becomes available for pick-up?

A large, empty rectangular box with a thin gray border, intended for the user to write the answer to question 9. A small diagonal line is visible in the bottom right corner of the box.

10. Where can you pick up your request when it becomes available?

A large, empty rectangular box with a thin gray border, intended for the user to write the answer to question 10. A small diagonal line is visible in the bottom right corner of the box.

11. When are recalled items due back to the library?

Default Question Block

Questions 12 through 18: For each given element below (left column) rate your satisfaction or dissatisfaction with respect to the how-to documentation in Task 1.

	Very Satisfied					Very Dissatisfied	
	1	2	3	4	5	6	7
12. Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Format	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Visual Aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Visual Effectiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Examples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questions 19 through 28: For each given statement below (left column) rate your agreement or disagreement with respect to the how-to documentation in Task 1.

	Strongly Agree					Strongly Disagree	
	1	2	3	4	5	6	7
19. The language was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. The examples were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. The purpose of the documentation was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. The examples were helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. The level of detail was							

appropriate for the purpose of the documentation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. The format of the documentation was interesting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. The format of the documentation was helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. The documentation answered user questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. The documentation left the user with unanswered questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I enjoyed reading this how to documentation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For question 29 answer in complete sentences.

29. Do you have any additional comments?

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Task 2 SS Survey

Block 1

Task 2: How to Search Summon

Thank you for reading the how-to documentation. Next, please answer the following questions. You may refer back to the documentation while completing this survey.

Please enter your 3 digit Participant ID:

For questions 1-5 answer True or False.

1. The default Summon search is a simple search for local and non-local items that the library has access to including those in Addison, the library catalog, subscription journals, participating databases, and freely available content.

- ☐ True
- ☐ False

2. The following expression will find results that do not contain the phrase “blue sky”: - blue sky

- ☐ True
- ☐ False

3. You can restrict your search by using a specific field and its search value in the Summon basic search box.

- ☐ True
- ☐ False

4. The expression “*tion” could return results containing the following words: navigation, station, diction, dictation

- ☐ True
- ☐ False

5. The tilde, question mark, and asterisk characters can all be used as the following expressions to get a result containing the word “Note”: No*e, Not~, No?e

- ☐ True
- ☐ False

For questions 6 and 7 answer in complete and clear phrases or sentences.

6. Where in the search phrase can wildcards be placed?

7. Which operator can be explicitly or implicitly used?

For questions 8-11 give the exact input expression that you would put in the Summon search box that meets the given criteria.

8. Provide one search expression that will return results that contain the following search terms within 12 terms of each other: coffee, fresh, roasted, local.

9. Provide one search expression that will return results that contain any of the following exact phrases: military, Army, dog tag, soldier.

10. Provide one search expression using the default search that will return results that contain all of the terms: tropical, green, rainforest.

11. Provide one search expression that will return results that include:
- Either of the following exact phrases: World War 2, World War II
 - The following search phrase followed by any number of characters: US
 - The search phrase: fleets

Default Question Block

Questions 12 through 18: For each given element below (left column) rate your satisfaction or dissatisfaction with respect to the how-to documentation in Task 2.

	Very Satisfied					Very Dissatisfied	
	1	2	3	4	5	6	7
12. Organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Format	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Visual Aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Visual Effectiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Examples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questions 19 through 28: For each given statement below (left column) rate your agreement or disagreement with respect to the how-to documentation in Task 2.

	Strongly Agree				Strongly Disagree		
	1	2	3	4	5	6	7
19. The language was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. The examples were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. The purpose of the documentation was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. The examples were helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. The level of detail was appropriate for the purpose of the documentation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. The format of the documentation was interesting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. The format of the documentation was helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. The documentation answered user questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. The documentation left the user with unanswered questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I enjoyed reading this how to documentation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For question 29 answer in complete sentences.

29. Do you have any additional comments?

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Task 3 OCS Survey

Block 1

Task 3: How to Use Off Campus Sign In

Thank you for reading the how-to documentation. Next, please answer the following questions. You may refer back to the documentation while completing this survey.

Please enter your 3 digit Participant ID:

For questions 1-5 answer True or False.

1. You need a valid Student ID number and password in order to access the restricted resources through the Off Campus Sign In service.

- ☐ True
- ☐ False

2. Once signed in to the Off Campus Sign In service, you must go through the library page to gain access to the restricted resources.

- ☐ True
- ☐ False

3. Former and active students, faculty, and staff will be authorized through Off Campus Sign In given a valid PID and password.

- ☐ True
- ☐ False

4. People using the VT campus network will need to authenticate using the Off Campus Sign In service.

- ☐ True
- ☐ False

5. If you are disconnected the Off Campus Sign In will automatically sign you in once the connection is reestablished.

- ☐ True
- ☐ False

For questions 6-9 answer in complete and clear phrases or sentences.

6. What is the Off Campus Sign In used for?

7. In what cases do you not need to use the Off Campus Sign In?

8. Where do you go to access the Off Campus Sign In button?

9. How can you tell if you are accessing a restricted resource from the Off Campus Sign In and not from the campus network or VPN?

Default Question Block

Questions 10 through 16: For each given element below (left column) rate your satisfaction or dissatisfaction with respect to the how-to documentation in Task 3.

	Very Satisfied					Very Dissatisfied	
	1	2	3	4	5	6	7
10. Organization	<div></div>	<div></div>	198 <div></div>	<div></div>	<div></div>	<div></div>	<div></div>

11. Language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Format	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Visual Aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Visual Effectiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Examples	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questions 17 through 26: For each given statement below (left column) rate your agreement or disagreement with respect to the how-to documentation in Task 3.

	Strongly Agree				Strongly Disagree		
	1	2	3	4	5	6	7
17. The language was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. The examples were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. The purpose of the documentation was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. The examples were helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. The level of detail was appropriate for the purpose of the documentation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. The format of the documentation was interesting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. The format of the documentation was helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. The documentation answered user questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. The documentation left the user with unanswered questions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I enjoyed reading this how to documentation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For question 27 answer in complete sentences.

27. Do you have any additional comments?¹⁹⁹



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Post Questionnaire

Block 1

Please enter your 3 digit **Participant ID**:

Default Question Block

For the following questions, choose or give the best answer.

1. Overall, which how-to documentation format did you prefer?

- ☐ Prose
- ☐ Step-oriented
- ☐ Comic

2. Overall, which how-to documentation format did you think was the most helpful?

- ☐ Prose
- ☐ Step-oriented
- ☐ Comic

3. Overall, which how-to documentation format did you think was the most clear?

- ☐ Prose
- ☐ Step-oriented

☐ Comic

4. Overall, which how-to documentation format did you think was the most interesting?

☐ Prose

☐ Step-oriented

☐ Comic

5. Overall, which how-to documentation format would you prefer for tasks similar to the ones you just read?

☐ Prose

☐ Step-oriented

☐ Comic

Do you regularly read comics (i.e. web comics like XKCD or PhD comics, comic books, informational comics like news comics, etc.) ?

☐ Yes

☐ No

To what extent do you read comics?

☐ Daily

☐ 5-6 times a week

☐ 3-4 times a week

☐ 1-2 times a week

☐ 1-3 times a month

Please write in comic(s) and short description(s) about the type of comic(s) you read.

Have you ever created a comic or comics?

- ☐ Yes
- ☐ No

To what extent do you create comics?

- ☐ Daily
- ☐ 5-6 times a week
- ☐ 3-4 times a week
- ☐ 1-2 times a week
- ☐ 1-3 times a month

Why do/did you create a comic or comics?

- ☐ For fun/entertainment
- ☐ For a class
- ☐ For work
- ☐ Other

Please write in why you create or created a comic or comics.

What type of comic or comics did you create?

- ☐ Entertainment comic
- ☐ Educational comic
- ☐ Technical comic
- ☐ Other

Please describe the type of comic or comics you create or did create.

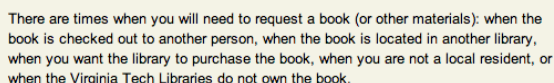
Do you have any additional comments?

Survey Powered By **Qualtrics**

Original Documentation Task 1 RB (Request a Book)

Library help

How to request a book



Borrowing privileges

*Newman Library break
hours*

Thu, May 22: Closed
Fri, May 23: 7:30am - 9:00pm
Sat, May 24: 9:00am - 6:00pm

Current semester hours

Request a checked out book

To request materials that have been checked out by another patron, search for the title in Addison. Use the request button at the top of the screen. Recalled items are due 21 days from when you submit the request or on the original due date: whichever comes first. Check My Library Account for the status of your requests; books listed with a status of ON HOLDSHELF are probably waiting for you.

Retrieve material from remote storage

If a book or bound journal is located in **remote storage**, you will either see a Request button next to it in a search results list or a Request button in the row of buttons at the top of the Addition screen. Click on the Request button, and Addition will ask you to enter your patron information (name and ID number) and pickup location. You can have material delivered to Newman, the Blacksburg branch libraries, or participating department office via the Book Runner service. Check My Library Account for the status of your requests; books listed with a status of ON HOLDSHELF are probably waiting for you.

Request a search for missing material

If you are looking for material you can't find on the shelf, double-check its status in Addison. Make sure it's not already checked out or put on Reserve and that you are looking in the right place. If you are sure you are looking in the right location, you should check the reshelving area on that floor for the material. Note that each shelving cart is in its own call number order. You may need to check multiple carts—or sides of carts.

If you still can not find a book after following the tips above, you may request the library conduct a search for the material by using the request button in Addison.

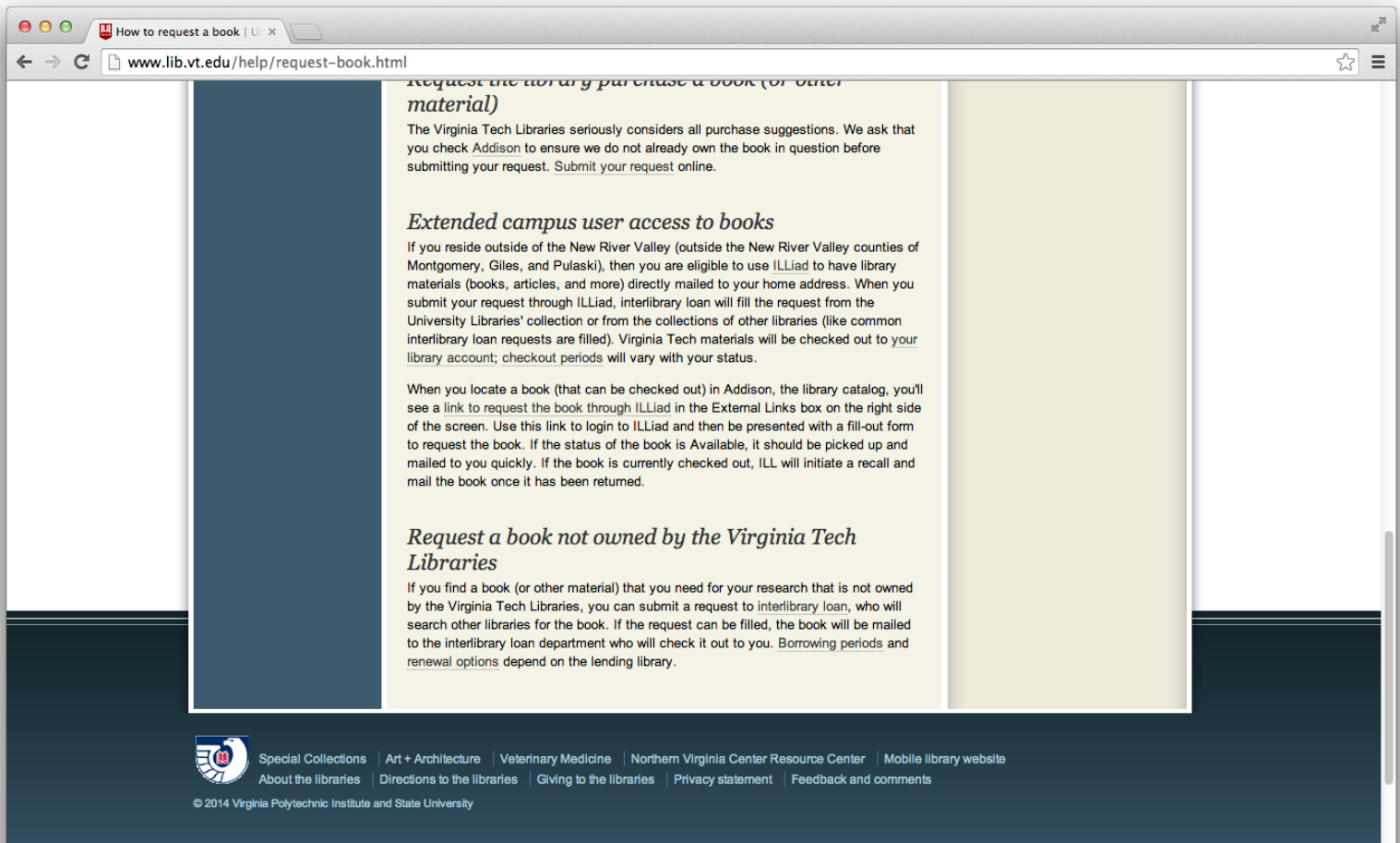
Search requests may take up to two business days to complete. You will be notified ASAP at the completion of the search. If the item is located, it will be held for you at the Circulation Desk unless it does not circulate. Otherwise, it will be set to status *missing*, and you are then eligible to use InterLibrary Loan to request the item.

Request the library purchase a book (or other material)

The Virginia Tech Libraries seriously considers all purchase suggestions. We ask that you check Addision to ensure we do not already own the book in question before submitting your request. Submit your request online.

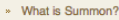
Extended campus user access to books

If you reside outside of the New River Valley (outside the New River Valley counties of



Original Documentation Task 2 SS (Summon Search)

Library help / Summon help



Current semester hours

Original Documentation Task 3 OCS (Off Campus Sign In)

