

Building the Games Students Want to Play: BiblioBouts Project Interim Report #1

Award number: LG-06-08-0076-08

Award Agent: Institute of Museum and Library Services

Award Title: Building the Games Students Want to Play

Awardee Institution: University of Michigan

Period Covered by the Report: October 2008 to April 2009

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April 10, 2009

Abstract

The University of Michigan's School of Information and its partner, the Center for History and New Media at George Mason University, are undertaking the 3-year BiblioBouts Project (October 1, 2008 to September 30, 2011) to support the design, development, testing, and evaluation of a computer game to teach incoming undergraduate students information literacy skills and concepts. This first interim report describes the project team's 7-month progress achieving 2 of the project's 4 objectives, designing the *BiblioBouts* game and initiating evaluation activities. It also enumerates major tasks that will occupy the team for the next 5 months. Game design details are given in appendix A that includes pedagogical goals and how the game scores players.

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Project Objectives

The BiblioBouts Project has the following four objectives:

1. Design and develop a game that teaches students information literacy skills and concepts while they do their assigned coursework.
2. Evaluate the game to determine its effectiveness for teaching information literacy skills and concepts.
3. Expand our list of premises for the design of information literacy games to give direction to future designers.
4. Develop a model of best practices for the design, development, and deployment of information literacy games so that institutions that want to pursue game development can streamline their efforts.

During the first 7 months of the project, the BiblioBouts Project team has made progress toward the fulfillment of objective #1—game design and development. Planning for baseline study data collection, the BiblioBouts project team has made direct progress on the second-listed objective. Its indirect progress on objective #2 pertains to the design of the game’s administrative interface that collects data on each individual game player’s game play for instructors to grade students and for the project team to conduct an evaluation of the game.

Project Design

Table 1 enumerates the 12 design steps of the BiblioBouts Project. It includes the people responsible for and the expected dates of the work effort. Design steps are the organizing principle for this first interim report.

For the first 7 months of the project (Oct. 2008 to April 2009), the BiblioBouts Project team has made progress on steps 1 to 3. For the next 5 months (May to September 2009), steps 1–6 will occupy the project team.

Table 1. 12 Design Steps of the BiblioBouts Project

Step	Date	Responsibility
1. Design and develop <i>BiblioBouts</i>	fall 2008, winter, spring, & summer 2009	Project team
2. Learn about the research needs of incoming students	winter & spring 2009	Principal Investigator (PI), Co-PIs, student assistants; instructors at participating institutions
3. Conduct baseline study #1	spring & summer 2009	PI, Co-PIs, student assistants
4. Test <i>BiblioBouts</i>	fall 2009 & winter 2010	Project team; library liaisons, students, and instructors at participating institutions
5. Conduct baseline study #2	fall 2009 & winter 2010	PI, Co-PIs, student assistants, library liaisons at participating institutions
6. Evaluate game play	fall 2009, winter & spring 2010	PI, Co-PIs, student assistants, instructors and students at participating institutions
7. Analyze evaluation data and report findings	spring & summer 2010	PI, Co-PIs, student assistants
8. Make design and development improvements to <i>BiblioBouts</i>	winter 2010, spring, & summer 2010	Project team
9. Test <i>BiblioBouts</i>	fall 2010 & winter 2011	Project team; library liaisons, students, and instructors at participating institutions
10. Evaluate game play	fall 2010, winter & spring 2011	PI, Co-PIs, student assistants; library liaisons, students and instructors at participating institutions
11. Analyze evaluation data and report findings	winter, spring & summer 2011	PI, Co-PIs, student assistants
12. Support widespread distribution and adoption of <i>BiblioBouts</i>	spring, summer & fall 2011	Project team

Step 1. Design and Develop *BiblioBouts*

Staffing the BiblioBouts Project Team

The Principal Investigator (PI) expected BiblioBouts Project team members to continue from the Delmas Foundation-supported Storygame Project team. Just as the BiblioBouts Project team began weekly meetings in October 2008, programmer Andrea Jenkins resigned from our games research to assume a new teaching position at ITT-Flint. The PI decided not to replace her until hiring a lead-programmer. Doctoral student assistant Beth St. Jean left the project to focus on her dissertation research but she promised to assist on BiblioBouts Project business that addressed scoring and credibility because of her expertise in the former and the connection to her dissertation with regard to the latter. Awarding doctoral student Xingxing Yao the project's Graduate Student Research Assistantship (GSRA) position for winter semester 2009, the PI charged her with developing the project web site's annotated bibliography on games.

To hire a contract programmer to fill the project's lead programmer-architect position, the PI had to draft and submit a Request for Proposal (RFP) to the University's Purchasing Department because the bid would exceed the University's maximum for services purchasing without a purchase order. Bidding, selection, and contract finalization were protracted due to Thanksgiving and Christmas breaks. Cyber Data Solutions LLC won the bid and lead programmer-architect Greg Peters joined the BiblioBouts Project team in early January. Since the New Year, the BiblioBouts Project team has these members:

- PI: Professor Karen Markey
- Co-PI: Associate Professor Soo Young Rieh
- Co-PI: Associate Professor Victor Rosenberg
- Project Consultant: Fritz Swanson
- Lead Programmer-architect: Greg Peters
- Programmer and Interface Designer: Brian Jennings
- Graduate Student Research Assistant: Xingxing Yao
- Doctoral Student Assistant: Beth St. Jean

Designing BiblioBouts

Waiting for the bidding process to conclude, the PI led BiblioBouts weekly meetings focused on game design. The team's first milestone was the PI's mid-December meeting with project partner Saginaw Valley State University (SVSU) where BiblioBouts will be deployed and evaluated in fall 2009 English 111 classes. Leading up to this meeting, the BiblioBouts Project team pushed themselves to envision BiblioBouts from start to finish. Summarizing the game's design in a draft statement, the PI shared the statement with SVSU librarians and the SVSU First Year Writing Program Coordinator who organizes the English 111 classes in which BiblioBouts will be deployed.

Since December 2008, the BiblioBouts Project team's design work has continued. In between weekly meetings, team members work on a design task that is best suited to their expertise and game-design experience, present it for comments at the next meeting, and rework it based on team members' feedback. Here are examples of specific design and development efforts:

- Co-PI Rieh formulated questions players answer in various mini-games

- Using these questions, programmer Jennings designed and redesigned interfaces to the Closer, Rating, Tagging, and Sorting mini-games, the game's homepage, a page to elicit rating comments from players, and a leaderboard. For example, see appendixes C and D for mockups of the Discipline and Credibility mini-game interfaces in *BiblioBouts*, respectively.
- Student assistant St. Jean designed the game's scoring algorithm, asked team members to submit scoring scenarios, simulated their scores using the algorithm, and revised it to reward players who play the game in ways that benefit themselves and other players.
- Project Consultant Swanson drafted a pedagogical goals statement that cites overall game goals, goals for BiblioBouts' mini-games suite, and scoring goals.
- Lead programmer-architect Peters consulted Zotero Co-Director Sean Takats at George Mason University to synchronize Zotero and BiblioBouts development schedules and to draft a timeline of development tasks between February and August 2009.
- Lead programmer-architect Peters created and implemented database schema to support user profiles/login, implemented scripts to allow players to create and manage their accounts, developed a script framework to allow creation and administration of individual games, and developed a scripting framework to interact with the Zotero API to support the Donor mini-game.

The BiblioBouts suite of information-literacy mini-games will continue to evolve as the project team switches its primary focus from design to development in mid-April. See appendix A for a description of the *BiblioBouts* mini-games suite that includes pedagogical goals and how the game scores players.

Step 2: Learn About the Research Needs of Incoming Students

Upon receipt of grant funds, the PI contacted all project participants via email about the award. Because the University of Michigan's (U-M) Comprehensive Study Program (CSP) was scheduled to be the first game-play deployment site, she included in her email message a request to start a dialogue with CSP staff. Following up with phone calls to CSP, she learned about major administrative changes in CSP leadership. At the TechSource Gaming, Learning, and Libraries Symposium in Chicago in November 2008 and the American Library Association in Denver in January 2009, the PI also touched base with the project's library liaisons (Gabrielle Toth, Chicago State University; Averill Packard, SVSU; Paul Waelchi, formerly University of Dubuque; Catherine Johnson, University of Baltimore) and briefed them on the project team's design progress and project timelines.

Making a site visit to SVSU on a snowy December 10, 2008, the PI briefed project participants on game-design progress to date. SVSU participants were enthusiastic about *BiblioBouts* and volunteered to deploy the game in 3 fall 2009 classes and in 6 winter 2010 classes. Reporting to the BiblioBouts Project team, the PI, Co-PIs, and Project Consultant decided SVSU would be the first BiblioBouts deployment site.

To learn about the research needs of incoming students, the BiblioBouts Project team planned to interview SVSU faculty and students. When the latter proved to be too

difficult due to timing, the team targeted the former, drafting a data collection plan and open-ended questions to determine the expectations that faculty have for the papers and bibliographies that students write and whether faculty anticipate improvements in student performance as a result of playing *BiblioBouts*.

The PI submitted a data collection plan and an open-ended interview questionnaire to the U-M's Institutional Review Board (IRB) in early February 2009 and received an exempt rating that allows the BiblioBouts Project team to start data collection.

The PI will visit SVSU in June to conduct personal interviews with faculty. Appendix B lists questions that the PI will ask in interviews.

The project team's design of *BiblioBouts* and its analysis of the bibliographic entries in student papers have been dictated by our assumptions about undergraduate students and their library-research habits. To confirm our assumptions, the project team needed to obtain input from SVSU instructors. In March, the SVSU's First Year Writing Program Coordinator invited the project team to forward a few questions to English professors via email so that we would not have to wait until mid-June for answers. We expect answers to these 3 questions in mid April:

1. What rules and guidelines do you give students about the works they use to write and cite in their papers, e.g., number of citations, variety of citations, their scholarly nature, etc.?
2. What are the citations like in students' papers? Are the majority of their citations to the web? Are they restricted to one particular source type, e.g., all web sites, all journal articles, etc.? Are students good at citing a wide variety of materials?
3. Imagine an ideal student bibliography. Describe the characteristics of this bibliography including the characteristics of the resources cited in the bibliography.

Step 3. Conduct Baseline Study #1

The BiblioBouts Project team will collect and analyze graded papers from classes before students play the game (baseline study) and from classes where students play the game (test study). SVSU faculty members have collected student papers from previous classes (baseline study) and will give them to the BiblioBouts Project team during the PI's June visit. Project team members will rate bibliographic entries with regard to certain criteria, e.g., source, currency, discipline, scholarliness, to determine whether the ratings of bibliographic entries in the papers written by students in classes that play the game are higher than the ratings of bibliographic entries in the papers written by students in classes that do not play the game. We will also test to determine whether there is a relationship between the quality of papers' bibliographic entries and the grades faculty give to them but we do not expect one because so many previous studies have failed to establish such a relationship.

To prepare for the task of rating bibliographic entries, the PI has undertaken an extensive literature review of published research papers on rating the bibliographic entries in student papers. Researchers who have rated bibliographic entries in student papers have one of these two objectives: (1) to assess student learning before and after an information-literacy intervention (which is comparable to the BiblioBouts scenario) or (2)

to evaluate the depth of a library's collection especially with regard to journal holdings for the purpose of supporting faculty and graduate-student research. Because researchers are consistent about citing a few early key papers¹ finding relevant research papers has been easy but there are so many that it may be impossible for the PI to conduct a comprehensive literature review. She will scrutinize relevant papers for the characteristics of student papers and their bibliographic entries that should figure into the analysis. She will also take into consideration the answers faculty give to our questions via email and in personal interviews.

Comparing baseline data and test study data will enable the BiblioBouts Project team to answer 2 of the project's 10 research questions:

1. Is gaming an effective approach for teaching incoming undergraduate students information literacy skills?
2. What do game players learn?

Project Dissemination Activities

The PI attended the TechSource Gaming, Learning, and Libraries Symposium in Chicago on November 2–4, 2008 where she gave oral presentations on the evaluation of the Delmas Foundation-supported *Defense of Hidgeon* web-based board game and on building information literacy games generally. When she cited premises for the design of future information literacy games, she told how the Storygame Project team arrived at these premises based on their experience building and evaluating *Hidgeon* and how these premises would guide the team in the design and development of *BiblioBouts*.

The BiblioBouts Project web site debuted in January 2009 at <http://bibliobouts.si.umich.edu>. Team members will monitor the web and professional publications to add to the site's "Games bibliography" pages (<http://bibliobouts.si.umich.edu/GamesBibliography.html>). They will also keep its "BiblioBouts Progress to Date" page up-to-date adding new entries every month or every other month that tell exactly what tasks occupy the project team and participating libraries (<http://bibliobouts.si.umich.edu/BiblioBoutsProgress.html>).

Future Plans (April to September 2009)

Between April and September 2009, the BiblioBouts Project team must design, develop, and debug BiblioBouts (step 1) so that it is ready for incoming SVSU students to play in September 2009. The team's efforts on steps 2 (research needs) and 3 (baseline study #1) are underway and will continue through summer 2009. Although game play starts a month before the deadline for the next interim report, the BiblioBouts Project team is looking ahead at steps 4, 5, and 6 that begin with game play but conclude in late 2009 or continue through the first quarter of 2010. Important subtasks connected with the 6 steps that will occupy the BiblioBouts Project team for the next 6 months are:

Step 1. Design and Develop BiblioBouts (April–August)

¹ Examples are Gratch, B. 1985. Toward a methodology for evaluating research paper bibliographies. *Research Strategies* 3, 4: 170–177; Kohl, D. F., & Wilson, L. A. 1986. Effectiveness of course-integrated bibliographic instruction in improving coursework. *RQ* 26: 206–211.

- Design and develop a fully operational *BiblioBouts* game that features this suite of mini-games: (1) Donor for contributing materials on a broad-based topic, (2) Closer for adding full bibliographic citations, screenshots and/or PDFs, (3) Policing for making sure citations and digital full-texts match and cover the topic, (4) Rating for assessing relevance and credibility, (5) Tagging for describing subject, discipline, and audience level, (6) Sorting for distributing donations into smaller, more manageable piles that describe aspects or narrower subtopics of the broad-based topic, (7) Rating Redux for reassessing the relevance of sorted donations, and (8) Dream Bibliography for choosing the best materials for a written paper.
- Design, develop, and pretest an operational administrative interface to *BiblioBouts* that enables instructors and game administrators to synchronize game play with in-class discussions and decisions and to collect data that instructors can use to grade student game play and that game administrators can use to evaluate game play.
- Design, develop, and pretest a fully operational user interface to *BiblioBouts* that enables game players to know how much progress they have made with regard to game play and where they stand vis-à-vis game leaders.
- Pretest the fully operational *BiblioBouts* to make it bug-free and unlikely that the game will be spoiled by technical difficulties or disruptions.

Step 2. Learn About the Research Needs of Incoming Students (April to July)

- Interview SVSU faculty who plan to incorporate *BiblioBouts* into their fall 2009 and winter 2010 classes.
- Determine how faculty expectations impact the papers and bibliographic entries that students write.
- Clarify how faculty expectations about student research habits should be reflected in the game's scoring algorithm.
- Identify the characteristics of bibliographic entries that indicate to faculty that students have chosen quality and trustworthy materials.
- Determine whether faculty think that there is a relationship between the published literature students cite in their papers and the grades they give to them.

Step 3. Conduct Baseline Study #1 (June to August)

- Complete the literature review of published research that rates the bibliographic entries in student papers.
- Select, define, and operationalize rating criteria.
- Collect papers that SVSU students write before playing *BiblioBouts*.
- Apply the rating criteria to student papers and analyze results.
- If needed, make changes to the game's scoring algorithm to reflect baseline study results.

Step 4. Test *BiblioBouts* (June–)

- Draft data collection instruments and procedures. This includes focus group interview questions, web questionnaire, and templates for student game-play diaries.
- Submit instruments and procedures to the U-M's IRB for approval. Determine if resubmission to SVSU's IRB is necessary.
- With SVSU librarians, determine the information literacy instruction they think they should cover in classroom presentations and demonstrations prior to game play, e.g., web searching, searching online library databases like ProQuest, FirstSearch, and CSA, using Zotero especially downloading citations, attaching digital full-texts, correcting citations, and making snapshots of digital full-texts.
- With SVSU instructors, determine the pace of the game so that they can schedule *BiblioBouts* mini-games to be in sync with offline game discussion and online game play.
- Incorporate BiblioBouts game play into 3 SVSU English classes in fall 2009.

Step 5. Conduct Baseline Study #2 (August–)

- Make minor improvements to the questions from baseline study #1 so they collect the desired data, e.g., improve wording, directness, clarity, definitions, etc.
- Host library liaisons from participating institutions (Baltimore, Chicago State, SVSU, and Troy) in a 3-day August meeting in Ann Arbor to train them to collect baseline study #2 data.
- Ask participating faculty to collect student papers one or two semesters before *BiblioBouts* game play debuts in their classrooms.
- Encourage library liaisons at participating institutions to schedule faculty for personal interviews.

Step 6. Evaluate Game Play (September–)

- Recruit student volunteers to keep game-play diaries.
- Collect game-play data through the *BiblioBouts* administrative interface.

Appendix A

***BiblioBouts* Design, Pedagogical Goals, and Scoring**

Introduction

BiblioBouts' primary goal is to give students practice and experience with the research process from start to finish. The game begins with a broad-based idea, topic, or driving question that guides students' search for information, building a collection of web sites, e-books, journal articles, etc., that addresses this idea. Game play pauses so that instructors can help students specify the aspects, subsets, features, subdivisions, or facets of the original idea, and resumes with students scrutinizing the collection for the best pieces that address these aspects, subsets, etc. Game play again pauses to let instructors help students formulate a specific research question, and resumes with students choosing specific collection pieces that disclose what others know about answering the research question from which they can fashion their own answers to it in the form of a bibliography and written report.

To play the game, students do research as a set of tasks that are discrete from other learning tasks and are even discrete from each other. We want students to be able to visualize the different tasks in research and to come to appreciate how they fit together. As much as possible, we want the students to get a sense of research as an independent activity, and maybe come to appreciate research as an aesthetic experience on its own.

To achieve this goal, students will gain valuable experience navigating the many digital library resources available to them in a university setting. Because they will be exposed to different resource formats such as web sites, journal articles from abstracting & indexing (A&I) databases, books via library catalogs, research reports and datasets from institutional repositories, students may come to expect different kinds of materials from them in terms of format, audience level, discipline, depth, formality, etc. We also want students to be able to intelligently assess the resources they retrieve from the digital repositories they search, especially for the web where quality is so varied.

The structure of the game is to posit an idealized research task targeted toward a theoretical research paper. The flow of the game moves from a broad-based topic that casts a wide net for collecting a comprehensive subset of available resources on that topic. The large resource collection will then be assessed in terms of its quality, content and audience. When students sort resources into smaller subcategories, they should get a sense of the topic's breadth and depth and how certain collection pieces excel in one or the other. The students will finally propose specific research questions based on the collection. One of those questions will be chosen, and the final game will be for each student to build a theoretical bibliography targeted at best answering that question.

Collection Building Mini-Games

GAME GOAL: Build a collection of resources on a broad-based topic starting with citations and culminating with matching digital full-texts that have the potential to address the broad-based idea.

PEDAGOGICAL GOAL: Give students experience and practice formulating queries for topics and searching a wide range of digital databases for potentially relevant information.

Formulating the Original Broad-based Topic, Idea, or Driving Question (Offline)

GAME GOAL: Formulate the broad-based topic that students will research.

PEDAGOGICAL GOAL: Give students practice and experience formulating a broad-based idea, topic, or driving question for which they are likely to find a body of published literature that reveals what others know about answering the topic.

WHAT HAPPENS IN ZOTERO AND/OR BIBLIOBOUTS: This is an offline class activity done with the guidance and advice of the instructor. The game begins when a group of students (a class, a part of a class, or a study group) select a broad-based topic. For example, a class might choose “Alternative Energy” as a broad topic of interest. Because of their knowledge of the library collection, librarians should be involved in this activity to advise everyone on the likelihood that the library’s digital collections will be able to populate the game with sufficient numbers of resources for chosen topics. Details about how Zotero creates a folder bearing the name of the chosen topic into which students will drag and drop the citations they find are yet to be determined.

SCORING: None

Donor Mini-Game

GAME GOAL: Build a collection with breadth and depth on the broad-based topic.

PEDAGOGICAL GOAL: Help students to see collection building as a discrete task. Focus on the fun of resource discovery and resource navigation. Help students to evaluate what they find for basic relevance to the broad-based topic (does this retrieval give me enough to work with?, is there another way of looking at this topic?, after I search the web, where do I look?) Some students will quickly collect a lot of citations from popular sources, other students will collect a few esoteric resources slowly, and other students will be lazy or confused. We want to reward both the fast/broad and the slow/quality strategies. We want to encourage the fast to recognize the benefits of the slow and vice versa. We want to help the lazy or confused to see the two different paths of success.

WHAT HAPPENS IN ZOTERO AND/OR BIBLIOBOUTS: Before Donor begins, librarians instruct students in online searching so that they know where to look after exhausting Wikipedia, Google, and the web. They also need to cover how Zotero functions so students know how to drag and drop citations into Zotero, download PDFs, correct citations, etc. Students use available digital repositories to find citations that address the broad-based topic. They drag them into a Zotero folder named for the chosen broad-based topic. *BiblioBouts* monitors students’ donations to Zotero to compute game players’ scores and list them on the leaderboard.

SCORING: Every donation gets a base score. *BiblioBouts* rewards a student who is the *first* to donate a citation by adding a 50% “first mover bonus” to his or her score. An “esoteric resource bonus” is added to the score for resources from digital repositories other than Wikipedia, i.e., 100% bonus for web resources, 200% bonus for library catalog

citations, 300% bonus for e-books, and 400% bonus for citations from library-supplied databases such as ProQuest, FirstSearch, and PsycINFO. In the event that the same resource comes from different databases, scoring should accrete rather than overwrite. For example, if one student donates a resource from Google Scholar and a second student donates the same resource from the Public Library of Science, the first mover (the first person to submit this resource) from Google Scholar will be awarded the first mover bonus *and* the second student will be awarded the Public Library of Science bonus. We are rewarding *paths* not *resources*, ultimately, because the goal is to get students to use many different databases.

Closer Mini-Game

GAME GOAL: Add digital texts to the collection on the broad-based topic and manually fix the citations that Zotero fails to parse automatically.

PEDAGOGICAL GOAL: Help students to see beyond the mindless, Pac-Man fun of resource navigation, discovery, and retrieval. A resource without a digital full-text or the wrong full-text is worthless. Increase students' understanding of and experience with the essential elements of bibliographic citations.

WHAT HAPPENS IN ZOTERO AND/OR BIBLIOBOUTS: Students earn points by adding supplementary information to their donated citations such as links to digital full-texts, screenshots, PDFs, abstracts, summaries, etc. Students copy their Zotero folders to *BiblioBouts* so that the collection resides entirely in *BiblioBouts*.

SCORING: Adding abstracts, links to full-texts, and snapshots of full-texts or PDFs increases a player's score for this mini-game.

Collection Assessment Mini-Games

GAME GOAL: Evaluate the potential of donated resources to address the broad-based idea or topic. The content of the resource will be categorized and qualitatively evaluated.

PEDAGOGICAL GOAL: Now that students have a collection of digital resources for the broad-based topic, this set of mini-games determines whether donations are complete, what the different resources can be used for, what are the best resources, and what characteristics of resources make them better than others.

Policing Mini-Game

GAME GOAL: Enlist student game players to police the collection, discarding (1) citations for which there is no attached digital full-text or snapshot, (2) citations that do not match digital full-texts or snapshots, or (3) citations that have nothing to do with the broad-based topic (for example, an article about Cicero when the topic is "alternative energy").

PEDAGOGICAL GOAL: Continue the critical evaluation of donated resources that began in the Donor Mini-Game. Students self-police retrievals rather than have game administrators, librarians, or researchers policing the collection for them. The more contact students have with collection materials, the more familiar they become with them which helps in subsequent mini-games and offline tasks.

WHAT HAPPENS IN BIBLIOBOUTS: The mini-game chooses a donated resource randomly, displays it to the player, and asks the player to answer a handful of questions such as: (1) does the donation address the [broad-based topic]?, (2) is the donation appropriate for you and your classmates?, and (3) does the PDF or screenshot match the citation? Taking into account several students' answers to these questions, *BiblioBouts* automatically reaches a consensus about discarding donations.

SCORING: *BiblioBouts* awards a base score to students who police their quota of donated resources. The mini-game adds a bonus for policing beyond the quota. Students whose policing data keep donations in or out of the game earn a bonus that is based on the extent to which they agree with other students policing the same donation. Also, the donating student gets a bonus if their donation passes other players' policing.

Audience-Level Mini-Game

GAME GOAL: Assign an audience level to a resource.

PEDAGOGICAL GOAL: Help students develop a sense of to whom a resource is directed, leading to an awareness of differing "voices" within a single discipline depending on audience. Students may make the observation that the audience level of resources from library-supplied databases is more advanced than open web resources.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to choose to which audience this resource is most obviously directed: (1) from 4th grade and up, (2) from 9th grade and up, (3) from college and up, (4) from college graduates and up, (5) scholars and scientists talking to their peers.

SCORING: *BiblioBouts* awards a base score to students who complete their audience-level quota. The mini-game adds a bonus to students' scores when they play this mini-game beyond the quota and adds another scoring bonus that is based on the extent to which a student agrees with other students assigning an audience level to the same donation.

Tagging Mini-Game

GAME GOAL: Develop a basic overview of the substantive content of a resource.

PEDAGOGICAL GOAL: Give students an opportunity to practice basic summary tasks (this is the verbal equivalent of "estimating" in mathematics). Give them practice generating keywords to improve their future subject searches. Increase their familiarity with pieces in the collection.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to type a keyword or phrase into a dialogue box. *BiblioBouts* compares the player-entered keyword or phrase with database-indexing terms from the original citation and with the keywords and phrases fellow students assigned to resources.

SCORING: *BiblioBouts* awards a base score to students who complete their tagging quota. The mini-game adds a bonus to students' scores when they play this mini-game beyond the quota. The game also awards a bonus to students based on the extent to which they match database-indexing terms and based on the extent to which they match the

terms assigned by fellow students. For example, exact matches earn more bonus points than normalized phrases, and normalized phrases earn more bonus points than word stems.

Discipline Mini-Game

GAME GOAL: Assign an academic discipline to a resource.

PEDAGOGICAL GOAL: Help students develop a sense that texts come from people with different disciplinary expertise and that texts are written for people in a specific discipline, leading to an awareness of what kinds of questions can be answered by a text, and what different disciplinary “voices” sound like.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to choose the branch of knowledge and/or discipline to which the resource is most obviously directed: (1) humanities: art and art history, English language and literature, modern languages and cultures, music, philosophy, religious studies, (2) social sciences: anthropology, economics and management, education, history, political science, psychology, sociology, (3) sciences: biology, chemistry, electrical engineering and computer science, geological sciences, kinesiology, mathematics, medicine, physics. See appendix C for a mockup of the Discipline mini-game interface in *BiblioBouts*.

SCORING: *BiblioBouts* awards a base score to students who complete their discipline quota. The mini-game adds a bonus to students’ scores when they play this mini-game beyond the quota. The game awards a bonus to students based on the extent to which they match 3 branches of knowledge and/or 21 disciplines selected by fellow students.

Credibility Mini-Game

GAME GOAL: Assess the “quality” of a resource.

PEDAGOGICAL GOAL: Help students come to a realization that they need to assess a resource’s quality, give them practice doing so, and, possibly, make the observation that the quality of resources from library-supplied databases should be higher than open web resources.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to answer these questions on a scale beginning at 0% (not at all), continuing at 50% (somewhat), and ending at 100% (to a great extent): (1) to what extent do you believe that this paper is written by an expert?, (2) to what extent do you believe that this paper is trustworthy?, (3) to what extent do you believe that this paper is scholarly? After answering each question, the mini-game asks students to tell why they gave it the rating they did. See appendix D for a mockup of the Credibility mini-game interface in *BiblioBouts*.

SCORING: *BiblioBouts* awards a base score to students who complete their credibility-rating quota. The mini-game adds a bonus to students’ scores when they play this mini-game beyond the quota and when they add reasons for their rating. The mini-game adds a bonus that is based on the extent to which a student agrees with other students rating the credibility of the same donation. The mini-game adds a bonus to the original donor of the resource that rewards high-rated donations more than low-rated donations.

Relevance Mini-Game

GAME GOAL: Assess the extent to which a resource addresses the broad topic.

PEDAGOGICAL GOAL: Help students come to a realization that they need to assess the extent to which a resources addresses the broad topic and give them practice doing so. Increase their familiarity with pieces in the collection.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to answer these questions on a scale beginning at 0% (not at all), continuing at 50% (somewhat), and ending at 100% (to a great extent): (1) to what extent do you believe that this paper has useful information on [insert the broad-based topic]?, (2) to what extent do you believe that the information provided by this paper is good enough?, (3) to what extent do you believe that the information provided by this paper is accurate? After answering each question, the mini-game asks students to tell why they gave it the rating they did.

SCORING: *BiblioBouts* awards a base score to students who complete their relevance-rating quota. The mini-game adds a bonus to students' scores when they play this mini-game beyond the quota and when they add reasons for their rating. The mini-game adds a bonus that is based on the extent to which a student agrees with other students rating the relevance of the same donation. The mini-game adds a bonus to the original donor of the resource—bonuses for high-relevance donations are greater than for low-relevance donations.

Topic Dissection Mini-Games

GAME GOAL: Dissect the original broad-based idea into specific aspects, subsets, features, subdivisions, or facets of the original idea that this collection can answer.

PEDAGOGICAL GOAL: Students need to rethink their original broad-based topic in light of the collection at hand. What aspects, subsets, features, subdivisions, or facets of the original idea can this collection answer? What resources address only one of these? What resources span several of these? Are relevance ratings stable or do they change?

Topic Dissection (Offline)

GAME GOAL: Specify aspects, subsets, features, subdivisions, or facets of the original idea that this collection addresses.

PEDAGOGICAL GOAL: Help students to synthesize and reflect on the assessment games in a way that leads to specific, useful questions that might bring focus to a theoretical paper. Questions developed in class should reflect an awareness of the content, discipline and audiences of the differing resources in the collection. Given these resources, what specific questions can I ask, and to whom will I direct my answer?

WHAT HAPPENS IN BIBLIOBOUTS: This is an offline class activity done with the guidance and advice of the instructor. The instructor asks the students to reflect on the material gathered that results in the specification of new questions that are aspects, subsets, features, subdivisions, or facets of the original idea that this collection can answer. For example, students might have noticed that resources in the “Alternative Energy Folder” can largely be divided into a few main energy types like Solar, Wind, Geothermal and Bio-mass. Librarians should participate in the discussion because of their

prior experience helping students in this way. At the conclusion of the activity, the instructor enters the names of new categories into an administrative interface that students will use to play the Sorting Mini-Game.

SCORING: None

Sorting Mini-Game

GAME GOAL: Sort resources into separate folders named for each aspect, subset, feature, subdivision, and/or facet.

PEDAGOGICAL GOAL: Give students experience and practice reassessing resources in light of their coverage of the aspects, subsets, features, subdivisions, or facets of the original idea.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to sort it into one of the new categories that is named for the aspects, subsets, features, subdivisions, or facets of the original idea.

SCORING: *BiblioBouts* awards a base score to students who complete their sorting quota. The mini-game adds a bonus to students' scores when they play this mini-game beyond the quota. The mini-game adds a bonus that is based on the extent to which a student agrees with the sorting of other students.

Relevance Redux Mini-Game

GAME GOAL: Assess the extent to which a resource addresses an aspect, subset, feature, subdivision, and/or facet of the original broad-based topic.

PEDAGOGICAL GOAL: Demonstrate to students that relevance is a moving target. For example, a resource that might have scored highly earlier in the research process may score lower based on how the broad-based topic evolves through the process of topic dissection. Increase their familiarity with pieces in the collection.

WHAT HAPPENS IN BIBLIOBOUTS: *BiblioBouts* chooses a donated resource randomly, displays it to the player, and asks the player to answer the following question beginning on a scale of 0% (not at all), continuing at 50% (somewhat), and ending at 100% (to a great extent): to what extent do you believe that this paper has useful information on [insert the name of the aspect, subset, feature, subdivision, or facet of the original idea]? After answering this question, the mini-game asks students to tell why they gave it the rating they did.

SCORING: *BiblioBouts* awards a base score to students who complete their relevance-rating quota. The mini-game adds a bonus to students' scores when they play this mini-game beyond the quota and when they add reasons for their rating. The mini-game adds a bonus that is based on the extent to which a student agrees with other students rating the relevance of the same donation. The mini-game adds a bonus to the original donor of the resource that rewards high-relevance donations more than low-relevance donations.

Final Production Mini-Games

GAME GOAL: Specify a research question and select the best resources to answer it.

PEDAGOGICAL GOAL: Give students experience and practice specifying a research question and choosing the best resources to use to answer it in the form of a bibliography and written report.

Assignment Focus (Offline)

GAME GOAL: Formulate the specific topic that will be the focus of the written paper in the form of a research question.

PEDAGOGICAL GOAL: Require students to think about what they have done so far, the collection they have in hand, its strengths, weaknesses, and potential for addressing aspects, subsets, features, subdivisions, and/or facets of a broad-based topic. Give students experience and practice formulating specific research questions that the collection can answer.

WHAT HAPPENS IN BIBLIOBOUTS: This is an offline class activity or done by the instructor alone. The instructor leads a class discussion that culminates with students specifying a research question or series of questions that the collection can answer. Drawing on their experience helping students, librarians should also be on hand to take part in the discussion and help students formulate the final research question and related questions series. For example, students might decide that they want to answer the question, “Which alternative energy approach is best?” and identify 3 or more viewpoints from which this topic could be addressed: “from a politically-expedient viewpoint,” “from a quick-to-market viewpoint,” or “from a reduced-carbon footprint viewpoint.”

SCORING: None

Assignment Production or “Dream Bibliography” Mini-Game

GAME GOAL: Select the best resources to answer the research question.

PEDAGOGICAL GOAL: Give students experience and practice choosing the best resources that they will use to answer a specific research question in a bibliography and written report.

WHAT HAPPENS IN BIBLIOBOUTS: This is the final mini-game. Students all try to build the best bibliography of a set size (maybe 5 to 10 resources based on the instructor’s instructions) to answer the specific research question in play. The student drags N resources into their personal folder bearing his/her BiblioBouts alias. When the student is satisfied with his or her folder’s contents, s/he hits a “Game Over” button.

SCORING: The game scores like a hand of poker or similar card game—high cards win. The “cards” are the resources for which the students determined the value in the collection assessment and topic dissection stages. *BiblioBouts* awards a base score to students who match the instructor’s designated minimum number of resources. The mini-game adds these bonuses based on: (1) matching the right audience level, (2) matching the right discipline, (3) how high the resource scored in the Relevance Redux mini-game and (4) in the Credibility mini-game, (5) a “popularity” bonus (how many game-players chose the same resource for their Dream Bibliographies), and (6) being the original donor of resources that other game-players choose for their Dream Bibliographies. After a student hits the “Game Over” button, *BiblioBouts* tallies the student’s final score in the game and updates the leaderboard as needed.

Appendix B

Baseline Study Questions for Faculty

1. What are the learning objectives for students taking [insert name of course]?
2. What do you expect students will learn in [insert name of course] that they can apply to other courses at [insert institution name] and to their academic careers generally? (Probe: How do the content, assignments, projects, and other course requirements pertain to other courses that [insert name of course] students will take?)
3. You assign [insert name of course] students a research-based paper. Tell me about this assignment. (Probe: How are topics assigned and approved? What topics are in-bounds and out-of-bounds? How many weeks do you give students to complete the paper? How many hours per week do you think students work on the paper? When you assign papers, what oral and written instructions do you give to students, e.g., length, format, content, grading criteria? What other preparation do you give to students prior to assigning the paper? What formal and informal input do you give to students in between assigning the paper assignment and the deadline?)
4. Imagine the ideal research paper for the assignment we just discussed and give this ideal paper an A. Describe this A paper. (Try not to probe but just in case: What makes this paper an A paper? Consider its content, completeness, argument, scholarly nature, format, length, number of bibliographic entries, quality of such entries.) How would you compare this A paper to the work your students have done in your most recent class? If the best papers in this most recent class are not your A ideal paper, what grade would you give those papers when graded against the ideal paper as opposed to when measured against the real work in a specific class?
5. Describe the rubric you use to assess papers, and, if possible, provide us a copy. What criteria are more important than others? What criteria are less important?
6. Let's talk about the bibliographic entries students include in their papers. What rules and guidelines do you provide that could help students to select literature for their papers? (Probe: What do you tell students about your expectations for their bibliographic entries, e.g., number, selection, format, variety of such entries, their scholarly nature? What is an average bibliographic entry, an exemplary entry, and a poor entry? If you evaluate these entries during grading, what criteria do you apply? What percentage of the paper's grade rests on these entries?)
7. Next semester, [insert name of course] students will be playing the BiblioBouts game while they research their papers. What expectations do you have about game play and the quality of students' papers? (Probe: How do you think game play will improve the quality of their papers? What impact do you think game play will have on your grading of student papers?)
8. Is there anything you would like to add?

Appendix C

Discipline Mini-game Interface in *BiblioBouts*

Progress:

Source

Ocean Waves Power a Generator: Device Uses the Sea To Power a Generator

Marlise Simons

New York Times (1857-Current file). New York, N.Y.: Sep 25, 1990. pg. C1, 2 pgs

Abstract:

BELFAST, Northern Ireland ON rocky headland bashed by the Atlantic Ocean, engineers are finishing a wave power installation that they hope will prove an important stepping stone toward much larger projects in the rush for renewable and clean energy.

[Full Text \(.PDF\)](#)

Tagging

Discipline:

What academic discipline best describes the pererspective taken by the author of this document?

Humanities

- Art & Art History
- English Literature and Language
- Modern Languages & Cultures Department
- Music
- Philosophy
- Religious Studies

Social Sciences

- Anthropology
- Economics & Management
- Education
- History
- Political Science
- Psychology
- Sociology

Sciences

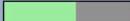
- Biology
- Chemistry
- Electrical Engineering & Computer Science
- Geological Sciences

From 4th grade up

Submit Audience

Appendix D

Credibility Mini-game Interface in *BiblioBouts*

Progress: 

Discipline:	Keyword(s):	Audience:
<i>Geological Sciences</i>	<i>ocean, waves, power, alternative energy</i>	<i>From college up (generally few primary sources)</i>

Credibility Questions

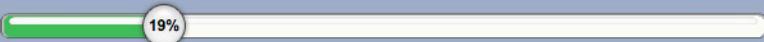
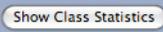
*To what extent do you believe that this paper is written by an expert?
Use the slider rate the source*

Not at all Somewhat To a great extent

 67%  Submit

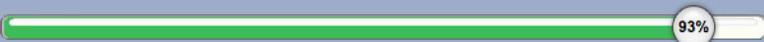
*To what extent do you believe that this paper is trustworthy?
Use the slider rate the source*

Not at all Somewhat To a great extent

 19%  Submit 

*To what extent do you believe that this paper is scholarly?
Use the slider rate the source*

Not at all Somewhat To a great extent

 93%  Submit 