

Life After TILT: Building an Interactive Information Literacy Tutorial

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Abstract

Academic librarians at a mid-size university library developed an online information literacy tutorial that is easy to create, access, edit, and organize even for those with limited time and technological skills. Modular in structure, Project Information Literacy Online Tutorial (PILOT) includes interactive exercises, media, and self-testing as well as quizzes that can be graded. The original development of this tutorial was not without its difficulties, but has resulted in a product that is flexible, powerful, and freely available for adoption and/or adaptation by other libraries.

Introduction

Ferris State University serves approximately 14,000 students at a total of 20 campuses around Michigan. Enrollment online and at Ferris's branch campuses has nearly doubled since 2001. By Fall 2010, about one fifth of all students were enrolled in fully online programs or programs at one of the branches.

In response to this growth, the University formed a Distance Education Task Force in 2004. The task force's recommendations, presented in 2006, included a suggestion that all first-time online students would complete a student readiness assessment. By 2008, this had evolved into an online student orientation that could be provided to every student regardless of location.

In 2009, the librarians at the Ferris Library for Information, Technology and Education (FLITE) were approached about creating an information literacy module for that orientation program. The librarians decided that to avoid duplication of effort, the orientation should simply direct students to the Project Information Literacy Online Tutorial (PILOT), their locally developed offshoot of the Texas Information Literacy Tutorial (TILT).

PILOT was already used by several teaching faculty to supplement library instruction efforts. Including it in the orientation program would expand its reach and provide branch-campus and online students with a basic grounding in information literacy and library resources--the perfect introduction to the library and information literacy for incoming students.

However, two things about PILOT were immediately apparent: Most of the content in PILOT was still as important as ever, but the presentation was dated and unappealing. The last systematic update to PILOT had been made in 2007, and few, if any, modifications had been made to PILOT since then. The instruction team decided that ten-year-old clip art in a hard-to-navigate tutorial was not the first impression of the library that they wanted to give Ferris's growing population of branch-campus and online students. The wording of PILOT's informative text could also stand to be updated.

A few members of the instruction team had edited incarnations of TILT before, both at Ferris and at other institutions. That process involved solid HTML skills, a great deal of hunting for files, reworking navigation links whenever pages were reordered, and fighting with outdated modes of using computer cookies--all on top of any desired content/phrasing edits. None of the librarians relished the idea of doing such an overhaul on PILOT, particularly since anything they did would only have to be refreshed again in

another painful overhaul just a few years down the road. Additionally, with the librarians' number of instruction sessions on the rise each year, it was unlikely that instruction librarians would ever have much time to work on keeping PILOT up-to-date or improving on it in the future.

At this point, two librarians with experience writing computer code stepped in and offered their services. They had been doing contract work through Marick Learning Services (<http://maricklearning.com/>), building a simple, no-frills learning management system for some school districts in Maryland. That code could be modified and expanded into a platform to run a new, easy-to-edit version of PILOT.

With a plan of action in place, the librarians began identifying standards, performance indicators, and outcomes from *Information Literacy Competency Standards for Higher Education* (ACRL, 2000) that aligned with PILOT's content or were determined to be so important that any update should include them. They researched ideas, examples, and best practices for online tutorials. They also considered trends from the results of three to four years of pre- and post-testing conducted on a selected number of English 150 instruction sessions who had come to FLITE for library instruction sessions.

Literature Review

In the Project Information Literacy (PIL) report, *Finding Context: What Today's College Students Say About Conducting Research in the Digital Age*, authors Head and Eisenberg (2009) write, "research seems to be far more difficult to conduct in the digital age than it did in previous times" (p. 2). They found that for many students beginning the research process is problematic. Students report not knowing what to look for, finding too much that is irrelevant to their topic, and general information overload along with many other difficulties. The PIL study also found that students use research techniques that are self-taught. Other researchers report that students are not savvy when it comes to evaluating the information they do find (McClure & Clink, 2009).

Online tutorials are effective teaching tools for information literacy. Few studies have been conducted comparing face-to-face information literacy instruction and online tutorials, but the results show online tutorials in a favorable light (Burkhardt, Kinnie, & Cournoyer, 2008). Some students may still have a preference for face-to-face instruction, but most like online tutorials and think they would be useful (Biddix, Chung, & Park, 2011). Students like the flexibility of going through online tutorials when they have time, when they have a need for the information, and as frequently as necessary to understand the concepts. Generic tutorials must still be applicable for students in multiple disciplines in order to be effective (Biddix, Chung, & Park, 2011; Su & Kuo, 2010). TILT, one of the largest, well-known online information literacy tutorials, was more effective in teaching transferable skills such as understanding the elements of a citation than in teaching inert knowledge, or non-transferred skills (Orme, 2004).

Information literacy tutorials are effective tools to assist with increased instruction demands at libraries with staffing shortages or freezes. Librarians in medium-size college and university libraries tend to support on average 30 to 40 faculty members; even in larger universities, librarians support faculty at a 22 to 1 ratio (Applegate, 2007). Faculty demand for library instruction is growing at many universities, and online tutorials are seen as one way to help meet that demand with limited resources (Dewald, 1999). However, many librarians have limited technological skills. There is a perception by library administrators that the lack of information technology qualifications of librarians is significant (Riley-Huff & Rholes, 2011). Though libraries are increasingly hiring new librarians with digital technology skills, there are difficulties filling those positions and sometimes they are filled by non-librarians. Retention of librarians in IT roles is also problematic and libraries continue to rely on librarians whose digital knowledge is largely self-taught (Riley-Huff & Rholes, 2011). At the same time, the economic downturn has led to decreased levels of FTE librarian staffing at a significant number of academic libraries since 2000. Hiring freezes, salary cuts, and a reduction of work hours are the preferred method of keeping staffing levels low (Nicholas, Rowlands, Jubb, & Jamali, 2010). Additionally, libraries have seen a redistribution of responsibilities to support staff and a redefinition of the role of the librarian away from legacy services (Stewart, 2010).

As useful and effective as online tutorials can be, students often fail to use them because they do not know the tutorials exist (Blummer, 2007; Bowles-Terry, Hensley, & Hinchliffe, 2010). Students will not go out of their way (or even think to look) to find a “tutorials” page. Placing the tutorial at their point of need [e.g. placing on a course page] is important. Librarians should also determine how they will communicate the existence of the online tutorial (Bowles-Terry, Hensley, & Hinchliffe, 2010). Students value what their professors value; consequently, faculty approval, encouragement, and assignment of library tutorials are essential to success (Appelt & Pendell, 2010).

The characteristics of effective online tutorials have been extensively studied. Effective online tutorials are modular (Donaldson, 2000; Reece, 2007); address concepts rather than just tools (Dewald, 1999; Reece, 2007); and have clear navigation, though there is some debate over whether or not they should include branching (Mestre, 2008; Reece, 2007; Ballin & Pena, 2006). Effective online tutorials also are delivered in a multimedia format (Dewald, 1999; Mestre, 2008). Most authors agree that online tutorials should be interactive, problem-based, and incorporate activities such as quizzes or other active learning techniques (Dewald, 1999; Mestre, 2008; Donaldson, 2000; Somoza-Fernandez & Abadal, 2009). Other elements of effective tutorials include clear learning objectives (Dewald, 1999; Reece, 2007) and the ability to ask a librarian if the student gets stuck or has a problem (Dewald, 1999; Mestre, 2008). Libraries undertaking large projects such as online information literacy tutorials are well-served by thoughtful planning (Franks, Hackley, Straw, & DiRenzo, 2000). Traditional instructional design methods modified and/or developed for libraries can assist in the creation of a well-developed tutorial (Booth, 2011).

Assessment and feedback are important steps in the development of online information literacy tutorial. Assessment should identify the success of aligning learning objectives with learning outcomes by measuring completion of tasks as well as efficiency of completion of tasks. Usage statistics, user surveys, and observation should be used, as well (Blummer, 2007). Rubrics can be utilized for consistent evaluation by multiple people (Prange & Sobol, 2008). Without professor feedback, assessment, and buy-in, an online tutorial may be doomed to failure through faculty ambivalence or disregard (Appelt & Pendell, 2010). Additionally, full integration of a robust online information literacy tutorial may change how and what instruction librarians teach (Fowler & Dupuis, 2000).

Design/Development

Since online tutorials are a form of instruction, members of FLITE’s instruction team formed the core of the PILOT 2.0 Team. Other librarians were invited to join the team based on experience revamping PILOT or on technical expertise, but only one librarian not on the instruction team accepted the invitation. This was the automation librarian, who became one of the software co-writers and brought the total team membership to six librarians.

While the two team members with computer coding experience worked on developing the system that would allow librarians with little technical knowledge to update content, the team as a whole met to start fleshing out ideas for what the tutorial should cover.

Technical development of the project that would become PILOT’s learning/content management system began while content discussions were in their infancy. The original coding project that PILOT’s platform grew out of had many characteristics of a simple learning management system:

- It was web based.
- It had student-, teacher-, and admin-level logins with different privileges assigned to each.
- It allowed teachers and administrators to associate metadata with an HTML page so the program could generate a navigation menu that never had broken links.
- It allowed pages to be grouped into units and lessons that would appear automatically on the navigation.
- It allowed content creators to reorder their pages easily, without having to fix “next” and “previous” buttons.
- It allowed content creators to create and edit interactive quizzes (both graded and ungraded) without needing any technical expertise.

- It allowed content creators to create drag-and-drop questions for formative assessment activities.
- It possessed drop box and message board capabilities.

The coding librarians realized that if PILOT were set up in a system like this, anyone who needed to update PILOT in the future would find it much simpler to do so. They also realized that not all of the difficulties in editing PILOT came from the challenge of figuring out which page needed to be edited or from wanting to change “complicated” content like quiz questions.

Instead, some of the challenges sprang from the facts that not all librarians really understood HTML very well (let alone JavaScript). Even those librarians who did understand HTML did not all have the access privileges necessary for uploading or editing HTML files on the library’s servers. These problems limited the number of librarians who were able to edit PILOT, leaving the bulk of the work to fall on very few shoulders.

For that reason, the coding librarians decided that when they adapted their original project to provide the backbone of PILOT, they would also add some content management components to it. They would create a web interface for page creation and editing, and also include the option to generate common HTML tags on demand. This would give easy access to PILOT content to an unlimited number of librarians. It would also allow less-confident page creators to select what they were trying to add to their page (for example, “biggest heading,” “smaller heading,” “numbered list”) without having to memorize HTML tags. The coding librarians hoped this would make building and updating the tutorial easier and less intimidating for all the librarians.

Work on the original system began in early 2010, and coding progressed using PHP, MySQL, JavaScript, HTML, and CSS. In early 2011, the PILOT system was deemed usable and PILOT’s content creators were invited to start adding content via the web interface. Updates to the code continued into the summer as librarians added content to the system and made suggestions.

The PILOT 2.0 team knew from the start that they wanted to keep PILOT’s modular structure. In determining how to break down content into modules, they mapped their chosen ACRL information literacy outcomes (Appendix I) to the existing tutorial’s structure. In the end the team found that a breakdown of subjects very similar to that found in the original tutorial would be the most logical way to present their material. The five units, or modules, that they decided to include were Identify, Select, Find, Retrieve, and Evaluate.

The team also decided that despite the old PILOT’s inclusion of material about how to cite sources in MLA and APA format, they would not include citations as part of their initial roll-out of the new PILOT. While everyone on the team agreed that citations are an important topic, the consensus was that classroom teachers and the Ferris State University Writing Center were more appropriately responsible for teaching citations than the library was. Furthermore, if there was demand for content covering citation styles, an additional unit or lesson could be added at a later date given the flexibility of the system.

It was determined that all content should be designed to appeal to an undergraduate student who isn’t willing to spend much time figuring a system out, and who expects polished presentation of content including easy navigation, attractive images, and other media.

In the end, the design decisions the PILOT team felt strongly about were:

- Content should be kept short and to the point.
- The tutorial should be modular, which each module capable of being used independently of the others.
- Content should appeal as much as possible to all types of learners (i.e., visual, aural, kinesthetic).
 - Multimedia should be incorporated where possible.
 - The tutorial should be interactive, with immediate user feedback where possible.
- End-of-unit quizzes whose scores can be emailed to professors must be included.

- The tutorial should be easy to navigate, even if the user does not wish to take the tutorial strictly in order.
- The new tutorial should be easy to update, even for those librarians without strong HTML skills.
 - Interactive elements must be easily edited in addition to static HTML elements.

The team was able to make those decisions with relative ease, but when it came time to actually create content, librarians met with unexpected difficulty. Each librarian was responsible for one unit of content (with two librarians sharing the Evaluation unit). However, the interface allowing the librarians to input pages and interactive elements was not yet complete. Uncertainty about tools and capabilities of the tutorial combined with the struggle of authoring new content to caused many of the librarians to feel completely lost when they tried to write their unit of the tutorial.

Furthermore, none of the PILOT 2.0 team members had release time to work on this project. Regular library business is already a full workload, and the PILOT 2.0 team had to build a new, large-scale tutorial on top of their other responsibilities. This bogged the tutorial-creation process down, making it impossible for some team members to devote time to the new PILOT on a regular basis.

There was some thought that creating a template for everyone to use while laying out their units might help simplify the authoring process. This effort failed as most of the librarians protested that the template did not fit their content.

Further efforts to have everyone storyboard their unit before creating it on the web server met with slightly more success, but still were not universally adopted. In the end, most librarians waited until the web interface was created and then used it to build content that they tweaked, edited and rearranged until they were satisfied with the results. The content/learning management system that supports PILOT makes it easy to rearrange pages, lessons, and units without breaking links. It also speeds up the process of writing HTML. Both of these traits reduce the wasted time when librarians create a page and then decide to modify it or rearrange its order in the tutorial.

All but one of the units were designed to be generic enough that another library could use them with few (if any) changes. One unit, Retrieve, focuses on library-specific tools and includes links to FLITE's pre-existing screencasts on topics like using the catalog or navigating the library website. This unit is the one that is most likely to need continuous updating as interfaces, vendor tools, and resources appear, evolve, and disappear.

Near the end of the tutorial-creation process, a graphic designer was hired to give the tutorial a polished appearance. His work on banners, fonts, and colors added visual panache that none of FLITE's librarians had been able to contribute.

Implementation and Evaluation

In July 2011, the PILOT team asked selected library student workers to run through PILOT and provide feedback. Other FLITE faculty librarians and administrators also provided feedback. All librarians on the PILOT team received comments on their units and used that feedback to make changes before the tutorial was released to the public.

The newly revamped PILOT went live at Ferris State University at the beginning of August 2011, in plenty of time for the start of the fall semester. At the moment the system went live, anyone who went to the old PILOT's URL ended up landing on the new PILOT. This ensured that no instructor would continue to use the outmoded version of PILOT, intentionally or otherwise. All university faculty members also received a postcard in the campus mail promoting the new version of PILOT. Further outreach efforts included highlighting the new PILOT at events like the university's Online Course Fair, at which the library presented a poster.

In December 2011, librarians sent an email questionnaire to faculty members known to have assigned PILOT to their students. Results of that survey have not yet been collected, but comments received during the semester show that the new PILOT has seen a mostly positive reception.

Conclusion and Future Directions

Online tutorials are very popular as a scalable way to provide students with the fundamentals of information literacy. Create a tutorial once, and it can be used over and over to instruct students, saving a great deal of librarian time. However, tutorials require technical skills to create, and not all librarians have such technical skills. What's more, tutorials become out of date relatively quickly, and require updating. Those updates also require technical skills, and are often a time commitment no one planned for. Neglected, the tutorial grows increasingly out of date until it is no longer usable. Then librarians are back at square one, doing all their instruction face-to-face, or else rebuilding the tutorial from the ground up.

The Project Information Literacy Online Tutorial and its content/learning management platform solve this problem by making tutorials easy to create, access, edit, and organize. The platform allows librarian users to create interactive quizzes and drag-and-drop questions without needing to know any programming languages, and also makes it possible to quickly build content pages even for those with only a passing knowledge of HTML. Other media can be embedded into content pages, as well.

Upcoming plans for PILOT include adding capabilities to it so that the library can assess student learning. A pre- and post-test tracking users' scores would enable FLITE to identify and address the tutorial's strengths and weaknesses. There has also been discussion of collecting demographic information from users, so that librarians could have a better sense of their audience's information-literacy background. The system PILOT runs on is capable of managing more than one large-scale tutorial, and FLITE may need to create a more advanced version of PILOT for graduate-level users.

FLITE's PILOT team hopes that other libraries will adopt PILOT and its platform for use at their institutions. An open-to-the-public version of PILOT is available for student-level viewing at <http://pilot.maricklearning.com/> for anyone who wishes to create a login. There is also a wiki page for PILOT adopters at <http://maricklearning.com/wiki/index.php?title=PILOT>.

Appendix I

ACRL Information Literacy Competency Standards for Higher Education used in PILOT
<http://www.ala.org/ala/mgrps/divs/acrl/standards/informationliteracycompetency.cfm>

Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicator Two

The information literate student identifies a variety of types and formats of potential sources for information.

Outcomes C, D

- Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)
- Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)

Standard Two

The information literate student accesses needed information effectively and efficiently.

Performance Indicator One

The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.

Outcomes A, D

- Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)
- Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system

Performance Indicator Three

The information literate student retrieves information online or in person using a variety of methods.

Outcome A

- Uses various search systems to retrieve information in a variety of formats

Standard Three

The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Performance Indicator Two

The information literate student articulates and applies initial criteria for evaluating both the information and its sources.

Outcome A

- Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias.

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