A Virtual Learning Environment for the Maritime Curriculum: Delivering Online Information and Instruction through Digital Library Resources and Distance Learning Modules

Ms. Constantia Constantinou
Maritime College, The State University of New York, United States
cconstantinou@sunymaritime.edu

Abstract: The study “A Virtual Learning Environment for the Maritime Curriculum: Delivering Online Information and Instruction through Digital Library Resources and Distance Learning Modules”, demonstrates how advances in technology and information delivery support and enhance the teaching and learning mission of SUNY Maritime College. SUNY Maritime College prepares students for careers through a content-centered curriculum and a hands-on, team building approach to learning. As a part of the STCW requirements, the SUNY Maritime Students are required to participate on two ninety-day summer sea terms, both aboard the Training Ship Empire State VI. The SUNY Maritime College student experience is furnished ashore and afloat with instructional technology for teaching and learning in the classroom, in library, at sea, and virtually from anywhere in the world. The study describes the technology for delivering electronic content, such as electronic journals, e-books, digital reproductions of primary documents for the maritime based curriculum, as well as a number of virtual services to online/distance learning students and faculty. In addition, the study outlines the successful development and implementation of a distance learning program where over 109 courses are taught, 49 are exclusively online courses and 50 hybrid courses using technology solutions such as Blackboard. Keywords: Maritime Curriculum; Library Electronic Resources; Distance Learning Education;

1. Introduction

The study “A Virtual Learning Environment for the Maritime Curriculum: Delivering Online Information and Instruction through Digital Library Resources and Distance Learning Modules”, demonstrates how advances in technology and information delivery support and enhance maritime teaching and learning at sea and ashore. Maritime College is one of the 64 colleges and universities of the State University of New York System (SUNY) and one of the six Maritime Academies in the United States granting United States Coast Guard licenses. The curriculum offers undergraduate and graduate degrees, and a European summer sea term of 90 days aboard the Training Ship Empire State VI, SUNY Maritime [1].
A VIRTUAL LEARNING ENVIRONMENT FOR THE MARITIME CURRICULUM

The Stephen B. Luce Library of SUNY Maritime College is an academic department accredited by professional organizations such as the Middle State Commission on Higher Education and it adheres to the standards and guidelines of the Association of the College and Research Libraries of the American Library Association, American Library Association [2]. The Librarians hold a faculty status and they are members of the college faculty. The Stephen B. Luce Library has the great advantage of being one of the most specialized maritime libraries in the world. As a member of a 64 SUNY-campus consortium, the library collects and acquires maritime specific collections in print and electronic formats. The Library is also in agreement to share its collections and to borrow collections from the other 64 SUNY colleges and universities. Consortium agreements allow the library to concentrate its collections on discipline specific material while supplementing the need and demands of library users with shared collections from other SUNY institutions. In addition, the Library has developed a very robust instructional programs in information literacy that supports the research requirements of the maritime disciplines in engineering, science, business, marine transportation, and the humanities with classroom teaching.

2. Digital Content and Online Information Research

The maritime industry has a long tradition of innovation and technology achievement. Recent years have seen a growing dependence on using information technology to enhance teaching and learning. The libraries have been pioneers in transforming print resources to digital resources and electronic content and delivering this content to users beyond the library’s physical environment. Similarly, technology on ships is constantly being implemented onboard to aid the seafarer in navigation, safety, and environmental awareness. Whereas our forefathers have used paper charts and sextants, today’s mariner must be knowledgeable on use of radar, GPS, electronic charting, and various other electronic publications [3]. Consequently, maritime educators are recognizing the need for students to be trained in information technology.

In the mid 1990s, as information evolved in many different formats, maritime libraries increased emphasis on library instruction programs and information literacy emerged as the instructional framework to develop students’ competencies in analytical skills and critical thinking. The Association of College and Research Libraries defined information literacy competency standards as “...a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” Information literacy, as defined, is the basis for lifelong learning because a student who graduates with the ability to locate, evaluate, and effectively use information can learn independently and address their own needs and questions in any area of life [4].

To train maritime students to become information competent, the Stephen B. Luce Library has interwoven a framework of technological tools, library instruction, and assessment activities to design a program that is infused in the Maritime curricula. The library facilitates access to a myriad of digital and print information sources along with some state of the art research tools such as enhance OPAC, federated searching, cross linking with Google, worldwide catalog, and more. Also, technology is incorporated into various pedagogical tools that are used to enhance students’ training in information competency. In addition, with the tools in place, the Library designed a robust instruction program to integrate information competency in the curricula. Various assessment activities have been implemented to provide much needed feedback on the effectiveness of the information competency training. The Library uses the assessment
data to continuously enhance the program. A key component for effective information competence training is to expose maritime students to some of the current technological tools.

2.1 Scholarly Resources at the Stephen B. Luce Library

As a member of the SUNY consortium of libraries, the Stephen B. Luce Library has access to online resources far beyond the scope of the maritime specific databases. These scholarly resources are subscription based and made available to students and faculty at SUNY Maritime from anywhere in the world through an authentication system. Some of these electronic databases are listed below:

<table>
<thead>
<tr>
<th>EBSCO Databases</th>
<th>EBSCO includes 7 separate databases. They are Academic Search Elite, Business Source Premier, Clinical Reference Systems, Health Source Plus, USP DI Volume II Advice for the Patient, Newspaper Source and Alt-Health Watch. These databases feature full text for a wide range of publications.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FirstSearch</td>
<td>The OCLC FirstSearch service offers a variety of indexes, abstracts and full text databases.</td>
</tr>
<tr>
<td>Gale Databases</td>
<td>A collection of databases covering literature, current events, business and more. Includes newspaper, journal and encyclopedia articles, both scholarly and general, in arts and literature, social sciences, current social issues, financial research, and health information. Full text coverage and indexes from 1980 to date.</td>
</tr>
<tr>
<td>HarpWeek</td>
<td>The Civil War segment covers the years 1857-1865. HarpWeek is the full-text, full-image electronic version of Harper's Weekly for the nineteenth century.</td>
</tr>
<tr>
<td>Homeland Security Digital Library</td>
<td>The Homeland Security Digital Library (HSDL) is the nation's premier collection of documents related to homeland security policy, strategy, and organizational management.</td>
</tr>
<tr>
<td>JSTOR - Arts &amp; Sciences I</td>
<td>This JSTOR collection includes full-text articles from the complete back runs of 118 journal titles in various disciplines, including many of the core research and society published journals in economics, history, political science, and sociology, as well as titles in the more science-oriented fields of ecology, mathematics, and statistics.</td>
</tr>
<tr>
<td>Lloyd's List</td>
<td>Lloyd's List is the leading daily publication for authoritative coverage on the shipping industry, including global shipping, logistics, global trade, marine insurance, and admiralty law.</td>
</tr>
<tr>
<td>Resource Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Marine Technology Abstracts</td>
<td>The Marine Technology Abstracts database contains bibliographic information providing a reference and description for over 90,000 technical articles, reports, books, conference and transaction papers and other material on all aspects of maritime technology, dating back as far as 1940 and drawn from all major marine engineering publications, published worldwide in at least 10 languages.</td>
</tr>
<tr>
<td>Milestone Documents in American History</td>
<td>Salem History’s <em>Milestone Documents in American History</em> is the first of five primary source resources from the Schlager Group and Salem Press. It combines 130 full-text primary source documents with expert analysis and commentary.</td>
</tr>
<tr>
<td>NetLibrary</td>
<td>529 medical and health-related eBooks and 125 new business titles with the original collection of 715 titles, SUNY-Connect now provides 1369 purchased eBooks as well as the public (i.e., free) collection of 3823 titles.</td>
</tr>
<tr>
<td>ProQuest</td>
<td>ABI/INFORM Global: American Medical Association; Newspapers Periodicals; Peer Reviewed ProQuest Newspapers: National Newspapers (27); Barron’s; The New York Times; Wall Street Journal</td>
</tr>
<tr>
<td>ScienceDirect</td>
<td>Contains 707 scholarly full-text scientific and medical journals. ScienceDirect offers full text access to over 700 Elsevier Science journal titles that cover areas including science, medicine and technology.</td>
</tr>
<tr>
<td>Springer Ebooks</td>
<td>A collection of about 17,000 titles of ebooks in 13 different subject areas, including Business &amp; Economics, Chemistry &amp; Material Science, Earth &amp; Environmental Science, Engineering, Humanities, Law, Mathematics, Physics, and more.</td>
</tr>
<tr>
<td>TRID Database</td>
<td>TRID is the world’s largest and most comprehensive bibliographic resource on transportation research information. It is produced and maintained by the Transportation Research Board. TRID covers all modes and disciplines of transportation and contains more than 900,000 records of published research. Over 64,000 records contain links to full-text documents.</td>
</tr>
<tr>
<td>Uncover Reveal Ingenta</td>
<td>UnCover Reveal is an automated alerting service that delivers the table of contents of your favorite periodicals to your email inbox.</td>
</tr>
</tbody>
</table>
3. Historical Research Digitized

Recognizing the value of historical maritime collections, the Stephen B. Luce Library decided to pursue the avenue of digitization to increase access and awareness and also to preserve the documents by minimizing handling of the physical collection. Starting in 2006, the Library laid the groundwork for digitizing major maritime collections and making them accessible to the public. The digitized portions of the collections served as a complement to the entire collection, increasing awareness to researchers and the public in general of the type of original documents that exist in maritime history. The major public entry point for the Stephen B. Luce Library digital collections is on a comprehensive web site devoted to the collection and hosted on the library’s web server and at various servers in New York State [5]. The research value of historical collections inspires high interest because of their uniqueness and how they compliment other Maritime collections. The library has been receiving many requests from researchers to access these historical collections from the fields of Maritime and New York City history, and genealogy. Researchers in the humanities who undertake research that documents the social history of the Maritime world benefit greatly by the access that digitization provides. The collection remains unique because, aside from the collections at other maritime institutions, there are few fully digitized maritime collections extant. Image 1 depicts a screen caption of the SUNY Maritime College Library Digital Collections on the New York Metropolitan Server.
4. Library Technology at Sea

The Library on the Training Ship Empire State VI is located on deck four and it occupies approximately 2500 square feet. It has a reading room with seating capacity for 55 people and shelving that holds approximately 7,000 books. Similarly with the SUNY Maritime College Library ashore, the Ship’s Library is furnished with the latest technology to facilitate the teaching and learning objectives of the SUNY Maritime students at sea.

The Ship’s library computer workstations are working off a several local networks, including several types of servers that are connected with the Ship’s intranet and the Ship’s satellite communication systems to provide access to the library’s digital resources. It is imperative to have the latest technology on modern ships. Technology is also a major mode of learning for the new generation of students. Young students are well proficient and oriented with technology and they are accustomed to instantaneous access to information. The decision making process at sea is subject to instantaneous access to information; prime examples are electronic navigation, electronic weather reports, electronic communication with other vessels and electronic access to important documents and resources.

The Library’s LAN is networked to the Ship’s intranet which is connected to the Empire State VI satellite communication system. Library computers provide access to electronic publications needed by the students for their studies. Electronic information is also provided specific to library operations and personnel; image and data banks; a suite of various training software; and the Library’s OPAC. Management of library operations is done using LibrarySoft, an integrated library management system. The LAN system also serves as a databank that houses images and the library’s electronic resources. The Library’s server is part of the Ship’s intranet server. It is possible that anyone from anywhere aboard the ship can access the library’s LAN system.

4.1 Maritime Electronic Resources at Sea

The Ship’s Library technology infrastructure is built on a local area network (LAN). Several computer workstations are networked to the Ship’s intranet which is connected to the Ship’s satellite communication system. Students and crew can access the electronic publications and research material through an image and data banks of various training software. The most updated editions of various official government publications are transferred in electronic format and made available on the library’s computers. These publications are on subjects such as ocean conditions, navigation, federal regulations; and several sources on countries/cultures information and port guides to support travelling to various ports of call. [Image 2.]
Students and crew have electronic access to titles such as *American Practical Navigator, List of Lights, International Code of Signals, Code of Federal Regulations, Pilot Charts, Sailing Directions, Radio and Radar Navigation*, and *Sight Reduction Tables, Countries and their Cultures, CIA World Factbook, and Encyclopedia of Food and Cultures*. Additionally, access to email enhances the delivery of electronic information to the Ship’s Library. The email system is set up to work with the Ship’s data satellite service. The Ship’s Librarian remains in constant communication with the librarians at the main library ashore. Whenever there is a need for access to additional electronic materials, the librarians are able to transmit the latest information via email to the ship’s library.

Students studying navigation use one of the leading reference works for marine navigation, the *American Practical Navigator* [7]. The electronic reference work encompasses thirty-eight chapters, on marine navigation, piloting, electronic and celestial navigation, navigation mathematics, navigation safety, oceanography and marine meteorology. The electronic format of the *American Practical Navigator* is the digital version of the print book which includes charts, drawings, and mathematical formulas as they appeared in the print version. The *List of Lights* is made available electronically by the Navigation Center of the United States Homeland Security, Coast Guard department [8]. The resource includes the most up-to-date information on the list of lights presented in a PDF format. Electronic access to the *International Code of Signals* provides the students with an overview of the history of the international code of signals and a detailed list with colored pictures of all signal flags.

In addition to the course-specific electronic resources the students are required to use during their studies at sea, the library also makes other related non-course-specific resources available through its networked stations. During the ninety days at sea, the Training Ship Empire State VI visits five to six European ports. Students have the opportunity to be exposed to other countries, languages, customs, cultures and civilizations. Exposure to other countries' customs and ethnic identities is a valuable lesson learned in an international discipline such as the maritime studies.

In addition to course specific resources, the library also makes available electronic information on resources such as Countries and their Cultures, CIA World Factbook, and Encyclo-
pedia of Food and Cultures providing invaluable information on other countries. Countries and their Cultures is a searchable database with images and maps with emphasis on the local and ethnic culture of each country. The CIA World Factbook is published and made available by the Central Intelligence Agency of the United States government. It is one of the most comprehensive and current databases on factual country information about the history, government, communication, transportation, population etc. The Encyclopedia of Food and Cultures is an electronic book format made available through the library’s Gale databases subscriptions. [Image 4.]

Web based sites are researched in advanced by the librarians and mounted to the Ship’s Library network for the Students and Crew to study prior to arriving at the Ports of call. Image 5 the Country Profiles for Summer Sea Term 2012.

Image 5.
5. Teaching Information Literacy and Pedagogy for E-Resources

The new generation of learners arrives at our campuses far more prepared in computer skills, far more skillful in multi-tasking and far more experimental. The students are also far more demanding in their expectations for instantaneous access to information. To acknowledge the students' new mode of learning the Stephen B. Luce Library set forth to bridge the generation gap by ensuring that the information and formats through which it is conveyed to students remains relevant. We may not underestimate the abundance of electronic and digital resources that could be very overwhelming to students conducting research; therefore, it is critical that the Library strives to teach research strategies as well as technology skills and competencies to students and faculty through the information literacy program. All library instruction sessions are computer-assisted, utilizing state of the art equipment for effective multimedia instruction and hands-on experience.

A major pedagogical tool for information competency training is the Library's online information literacy tutorial. This full-scale, multi-module tutorial is designed to assist students in navigating through the information research process at their own pace. It is also an important tool for distance learning students to learn about the information research process.

In addition to the information literacy program, the Library continues to streamline all library resources in support of the courses taught online for the SUNY Maritime College distance learning students. SUNY Maritime initiated its distance learning program in the spring of 2004. During the fall 2011 semester, there were 1,228 students enrolled in 80 blended and 29 online sections and 54 faculty involved across the 109 sections. Image 6 demonstrates the Library's online module in support of a distance learning course.
6. Research Tools for Retrieving Online Content

The online public access catalog (OPAC) is the main gateway to researching the Library’s collection and students are well trained on its use. With the name of The Sextant, students easily associate the OPAC as a tool to navigate information. The librarians constantly incorporate new technology to enhance the OPAC as a one-search interface for all print and electronic resources. All electronic books (ebooks), electronic government publications, and other similar sources are fully searchable and are just a click away with embedded URLs in the OPAC. Detailed information on books such as summaries, table of contents, and excerpts are accessible through the OPAC with cross-linking service to Google Books.

Stephen B. Luce Library subscribes to over 70 information data banks with access to more than 47,000 titles of periodicals. With such an array of sources it is often a difficult task for students to search each information resource individually. To streamline this process the Library implemented a new information portal, called The Beacon, which uses federated search technology. This enables students to search multiple information databases through one search interface. Intense training on the use of the Beacon is done during library instruction sessions, where students are taught how to construct effective search strings to retrieve relevant results.

Today’s generation of Maritime students are web savvy and very inclined to do all information research using Google only. It is a challenge for librarians to teach students on how to use Google competently and a significant part of library instruction dwells on evaluating web sources and suggests the use of academic versions of Google such as Google Scholar and Google Books. To facilitate the students’ search habits, the Library has partnered with Google to make its collection searchable via Google search engine. So, as an example, a cadet searching Google Scholar for information on “Ship Navigation” will see results for Stephen B. Luce Library [see Image 7].

The Stephen B. Luce Library makes every attempt to increase access to information resources for the Maritime College community. All subscribed electronic resources are accessible 24/7 and from anywhere via special server technology, called EZProxy. Also, through Luce Library membership to resource sharing consortiums, Maritime students have access to many more books and other information sources not available in the Library’s collections. Using a worldwide OPAC, called Worldcat, students can search and request any items from libraries nationally and internationally. This process, referred to as interlibrary loan, is managed by a 24/7 online system with the capability to deliver materials electronically.
7. Inter-Library Loan

Technology innovations have made it possible for the library to deliver scholarly content to the students and faculty by enabling delivery mechanisms such as electronic Interlibrary Loan that is initiated by the library user [6]. Students and faculty are able to initiate borrowing transactions of books and journal material directly from the library’s portal and borrow any item from a network of libraries.

8. Conclusion

The SUNY Maritime College Library plays a critical role in providing the academic community ashore and at sea with the most relevant up-to-date information. One of the most important objectives of educating mariners at sea is learning to appreciate and understand access to information as a critical component to decision making. Traditionally and throughout history, young mariners learned how to read and write and received their education from books they read at sea. Advancements in technology have revolutionized maritime studies in the areas of navigation, engineering and communication. Academia and Libraries work closely with the demands of the maritime industry to train and educate students who are proficient with research and access to digital information. Work is underway to develop a complete online information literacy module and library services for mobile technology to incorporate into online courses for the
distance learning program. In addition, the library remains diligent in conducting assessment programs and measuring the learning outcomes of our student success. The Library’s ability to deliver a wealth of online resources and digital resources on land and at sea demonstrates how advances in technology and information delivery support and enhance the teaching and learning mission of SUNY Maritime College.

References


