Building an Information Literate Community the "E" Way

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Abstract

This case study describes an online information literacy package developed by a polytechnic library in Singapore. The article describes the context, conceptualization, design considerations, and evaluation of the package, which was integrated into two of three General Education modules at Singapore Polytechnic (SP). Designed as a holistic package for self-directed learning both within and outside of the curriculum, these learning materials are accessible to all students via the institutional e-learning platform.

Keywords

Information Literacy, Academic Libraries, E-learning, Educational Technology, Blended Learning, General Education

Introduction

As an institute of higher learning (IHL), Singapore Polytechnic (SP) has established its vision to develop 'a caring community of inspired learners to serve with mastery' (Singapore Polytechnic, 2016). This vision is in line with the broad direction of nationwide initiatives such as SkillsFuture – a national movement introduced to help Singaporeans develop and master relevant skills throughout their careers and lives (Government of Singapore, 2016).

To realize its vision, the institution identified three priority areas in 2015 – namely (i) Educational Technology (EduTech), (ii) Staff Capability and (iii) Industry Engagement. SP Library was one of the pilot departments assigned to the priority area of EduTech, where staff were required to experiment with EduTech tools to enhance teaching and learning, and subsequently introduce these tools to enhance students' learning experience.

As part of this EduTech initiative, SP Library developed and implemented an online Information Literacy (InfoLit) package for all students that is integrated with the institution's General Education (GenEd) modules in 2016. This package is accessible to all students via SP's e-learning platform (BlackBoard) and designed as a holistic experience for self-directed learning, both within and outside of the curriculum. To enable students to contextualize and apply effective information search to their domains of expertise, extension and customization packages (also known as InfoLit+ content) were introduced.

Objective

Given the volatile, uncertain, complex and ambiguous (otherwise known as "VUCA") conditions of the world, there is increased demand for individuals to develop information and computer skills (Eymann, 2016). Today's students are increasingly required to possess theses skills upon graduation. The 21st century competencies of critical thinking, problem solving and effective communication (Ajith, 2015) are highlighted in the Singapore Ministry of Education's Framework for 21st Century Competencies and Student Outcomes (Ministry of Education, Singapore, 2015). This same set of skills is also essential for lifelong learning (Ross, Perkins, & Bodey, 2016), which is what SkillsFuture sets out to achieve - where individuals constantly seek to access and acquire new knowledge and skills for continual learning (Government of Singapore, 2016).

Conceptualizing the Information Literacy package

A literature review found that across North America, academic libraries embarked on the Assessment in Action: Academic Libraries and Student Success (AiA) programme by the Association of College and Research Libraries (ACRL) in 2013. Several of these projects documented that 'libraries improve their institution's general education outcomes and demonstrate that information literacy contributes to inquiry-based and problem-solving learning' (Brown & Malenfant, 2016).

For SP, it was fitting to integrate the InfoLit package within the GenEd modules so that students can search for relevant information and substantiate their understanding of global issues and civic engagement with evidence from credible and authoritative sources. This is similar to what the AiA programme sought to achieve. All students are required to complete the set of GenEd modules during their three-years at the institution. By integrating InfoLit into the GenEd curriculum, it is anticipated that students will gain introductory InfoLit skills for use in GenEd and other areas of study. By developing extensions to be used by tutors in specific classes, students learn to apply search concepts to actual learning topics and to find relevant information to substantiate their argument.

Students who completed the GenEd modules may revisit this content via the e-learning platform as and when they require a refresher. Further, self-directed learners who wish to take effective information search to the next level can also refer to additional curated content within these packages.

To enable students in further applying information search skills to their domains of expertise, a core Business module was identified beyond the GenEd modules and the Library team collaborated with the module coordinator to design a customized package, which would assist students in their industry-linked project. This allowed students to apply specific search skills to real-world topics, thereby enabling them to see the practicality and importance of Information Literacy skills.

The rest of this article will discuss the rationale for this package and the details of implementation.

Stakeholder engagement and support

Having a set of competencies which students are able to understand and work towards as tangible and measurable outcomes is crucial. To establish this, each section within the package was mapped to the Information Literacy Competency Standards for Higher Education by the Association of College & Research Libraries (ACRL) (American Library Association, 2000). Figure 1 shows the ACRL standards that are mapped to the InfoLit package.
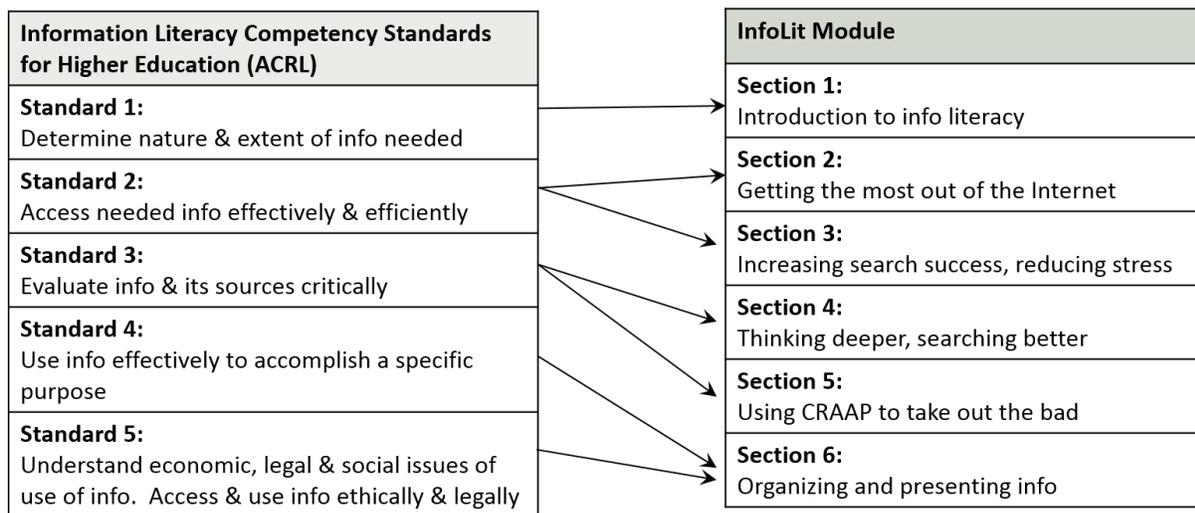
Information Literacy Competency Standards for Higher Education (ACRL)	InfoLit Module
Standard 1: Determine nature & extent of info needed	**Section 1:** Introduction to info literacy
Standard 2: Access needed info effectively & efficiently	**Section 2:** Getting the most out of the Internet
Standard 3: Evaluate info & its sources critically	**Section 3:** Increasing search success, reducing stress
Standard 4: Use info effectively to accomplish a specific purpose	**Section 4:** Thinking deeper, searching better
Standard 5: Understand economic, legal & social issues of use of info. Access & use info ethically & legally	**Section 5:** Using CRAAP to take out the bad
	Section 6: Organizing and presenting info

Figure 1: ACRL Standards and section mapping

This mapping was shared with selected lecturers at the implementation level to gather stakeholder feedback. The sections were further mapped to the Media and Information Literacy Curriculum for Teachers framework introduced by United Nations Educational, Scientific and Cultural Organization (UNESCO) (Wilson, Grizzle, Tuazon, Akyempong, & Cheung, 2011) as detailed in Figure 2.
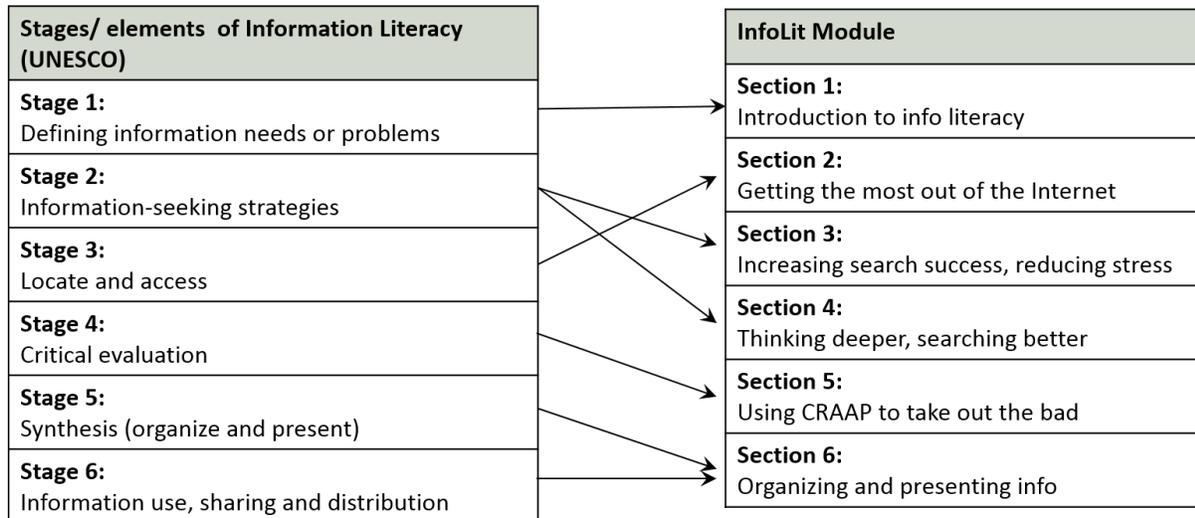
Stages/ elements of Information Literacy (UNESCO)	InfoLit Module
Stage 1: Defining information needs or problems	**Section 1:** Introduction to info literacy
Stage 2: Information-seeking strategies	**Section 2:** Getting the most out of the Internet
Stage 3: Locate and access	**Section 3:** Increasing search success, reducing stress
Stage 4: Critical evaluation	**Section 4:** Thinking deeper, searching better
Stage 5: Synthesis (organize and present)	**Section 5:** Using CRAAP to take out the bad
Stage 6: Information use, sharing and distribution	**Section 6:** Organizing and presenting info

Figure 2: UNESCO stages and section mapping

Together with the GenEd module coordinators, potential linkages between the InfoLit package and the lesson plans for the two modules, namely GenEd 1 and 3, were identified to motivate students' interest. Interactive activities such as games and rewards system were also incorporated to engage the students in their self-learning. The collaboration and input from the academic staff provided increased understanding of learning needs and enabled the InfoLit package content to align closely with the curriculum.

During development, the package was presented to a sample group of students and their feedback was taken into consideration for a student-friendly learning experience. Near its completion, feedback from a larger sample group was sought and further refinements were made before the final package was presented to members of the EduTech Steering Committee. The Committee was comprised of Directors from all pilot departments of the EduTech initiative.

By establishing stakeholder engagement at both implementation and strategic levels, the Library strove to align the package content to the curriculum. This subsequently provided institutional support to implement the package within the GenEd modules.

Design considerations (5Es)
The factors for the package design included:
1. Electronic accessibility
2. Engaging content
3. Efficiently built
4. Extensibility
5. Engagement potential

1. Electronic accessibility
The package was made available to all students via the institutional learning management system, Blackboard, so that learning can be done out of class time, at a self-directed pace and in

convenient settings. Students were already familiar with this platform and so was an important consideration when deciding the delivery mode of the package, as users are more likely to adopt innovations that are simple to use and implement (Black, Beck, Dawson, Jinks, & DiPietro, 2007).

Package outline and navigation instructions were developed in accordance with good learning design principles provided by the Educational Technologists from the Department of Educational Development. This ensured that students would be familiar with the layout and navigation flow.

2. Engaging content
Content includes bite-sized lecture videos to deliver concepts in less than 6 minutes each, manga-themed storyline animations with student characters explaining concepts in daily situations, quizzes to motivate students as they progressed through each section, infographics to summarize key concepts, as well as interactive assessment components such as crossword puzzles and matching games to test understanding. These were developed using a range of software and EduTech tools were used, such as Office Mix, GoAnimate, Easelly and SoftChalk.

At the end of selected sections, students could generate certificates if they attained a minimum score. This enabled tutors to keep track of their students' attempts and levels of competence. The certificates also serve as evidence of the students' achievement in learning information literacy skills.

3. Efficiently built
Beyond content developed in-house, curated content was leveraged upon to broaden students' perspectives on learning. Relevant learning resources, websites and videos, developed and shared by fellow educational and library professionals online were weaved into the package. Utilizing external content enabled efficient building of the package while promoting differentiated learning.

4. Extensibility
Beyond covering information literacy concepts, we wanted students to be excited about the subjects that they were studying (Csikszentmihalyi, Rathunde, & Whalen, 1993) and to be prepared for future careers in higher education settings (Pham, 2012).

Extensions were developed in the form of in-class search activities to complement the basic InfoLit package so that students can apply the concept of information literacy to their respective domains of study. When in doubt, students can seek clarifications from tutors in class. This ensures that the richness and timeliness of face-to-face communication (Flaherty, Pearce, & Rubin, 1998) is retained to allow for addressing specific learning concerns more effectively.

A customized package was also developed for Business School students to tie in with their industry project. Content that was formerly delivered through face-to-face instruction was incorporated into bite-sized videos put into the package. This enhanced the way in which library instruction is delivered to students and remained consistent with SP Library's continuous focus on imparting information literacy as a lifelong skill within course curriculum.

By getting students to go through the bite-sized videos and attempt searching for information prior to the session, in-depth face-to-face tutorial sessions were then focused on targeted information needs. This allowed students to synthesize and apply search strategies and techniques to their industry project. Students could also seek clarifications, and librarians were able to assess their understanding during the interaction.

5. Engagement potential

SP's 4ECs Learning Activities Design Model (excite, engage, empower, evaluate, connect) introduced by the Department of Educational Development was used to align the package's design to pedagogical principles used within SP. This makes it easier for the Library to collaborate with different schools and to ensure that when building extensions for modules, the learning activities align with the curriculum and SP's pedagogical methods.

The extended and customized packages made available to the Business School could also be used as a model and further contextualized/developed for other schools within SP. They complement existing library instructional efforts and are in step with teaching and learning trends within the institution, such as embarking on flipped classroom and case method approaches.

Evaluation

Students who used the InfoLit and customized business packages were requested to provide feedback. For the InfoLit package, it was through an online questionnaire designed by the Library and administered by the module coordinators. Feedback for the customized business packages were collected using an evaluation form administered by librarians at the end of the face-to-face tutorial session as well as the weekly one-minute feedback exercise administered by the module coordinator.

GenEd InfoLit package

The online questionnaire comprised three (3) rating questions followed by two (2) open-ended questions, namely 'What was the most engaging aspect of the Information Literacy Module?' and 'Comments to improve the Information Literacy Module.'

Table 1 shows ratings from students for Academic Year (AY) 2016 Semester 1 and Semester 2 (as of 23 January 2017). The number of responses was 228 and 248 respectively.

Evaluation Questions (Students)		Sem 1	Sem 2
Q1	The Information Literacy Module by SP Library helped me learn how to locate, evaluate and use needed information effectively.	3.82	4.09
Q2	The content in the module is well-organized, engaging and empowered me to learn at a self-directed pace.	3.86	4.08

Q3	The quizzes allowed me to assess my understanding and provided appropriate feedback.	3.85	4.13

Table 1: Ratings from students for InfoLit module
Scale: 1 indicates strongly disagree and 5 indicates strongly agree

For the most engaging aspects of the InfoLit package, students felt that it was fun and easy to navigate. It also helped them differentiate and evaluate the information sources. They were able to understand the contents quickly due to the clear videos and instructions aided by engaging infographics, cartoons, animations and puzzles. The certificate awarded at the end of major sections gave them a sense of achievement and helped them to track their learning progress. Suggestions to improve the module include having more animated videos and questions.

Separately, an online questionnaire to obtain tutors' feedback was also administered by the Library. There were four (4) rating questions followed by two (2) open-ended questions, namely 'What was the most engaging aspect of the Information Literacy Module?' and 'Comments to improve the Information Literacy Module.' There were 16 responses recorded.

Table 2 shows ratings from tutors for AY2016 Semester 1. Data for Semester 2 was unavailable at the point of submission of this article.

Evaluation Questions (Tutors)		Sem 1
Q1	The Information Literacy Module by SP Library helped my students learn how to locate, evaluate and use needed information effectively.	3.92
Q2	The content in the module is well-organized, engaging and empowered my students to learn at a self-directed pace.	4.08
Q3	The quizzes allowed my students to assess their understanding and provided appropriate feedback.	4.08
Q4	The in-class search activities reinforced the concepts and facilitated collaborative learning.	3.85

Table 2: Ratings from tutors for InfoLit module
Scale: 1 indicates strongly disagree and 5 indicates strongly agree

From the feedback, lecturers found the content, particularly videos, engaging, interactive and humorous in getting content across through situations which students found identifiable. This helped to make learning about information literacy concepts relatable to real-life situations.

Customized Business package
Table 3 shows ratings from the evaluation administered by librarians at the end of the face-to-face session with the Business students in AY2015 Semester 1 and AY2016 Semester 1. The number of responses was 297 and 235 respectively.

Evaluation Questions (Students)			AY2015 Sem 1	AY2016 Sem 1
Q1	Content	The coverage was well-organized and relevant for my coursework/project	4.37	4.35
Q2	Materials	The learning support materials (e.g. slides, handouts) are useful	4.02	4.29
Q3	Usefulness	The instruction helped me to improve my ability to use library and information resources effectively.	4.22	4.31
Q4	Overall evaluation of the library instruction session		4.24	4.31

Table 3: Ratings of Business students for face-to-face session
Scale: 1 indicates very poor and 5 indicates excellent

The customized business package was first introduced in AY2016 Sem 1, where we took into account feedback received from students in AY2015 Sem 1 when developing the content. There was improvement in the ratings received in AY2016 Semester 1 as compared to AY2015 Semester 1 in terms of the usefulness of learning support materials, library instruction and overall evaluation of the library instruction session.

In addition, the Library tapped on the weekly one-minute feedback exercise administered by the module coordinator. A total of 1,502 responses were received in AY2016 Semester 1.

Response from One-minute Feedback (Students)		Yes	No	Nil
Q1	Did the SP Library videos help you learn how to search for information?	814 (54%)	345 (23%)	343 (23%)
Q2	Were you able to find relevant information using the databases/resources provided by SP Library?	775 (52%)	211 (14%)	516 (34%)

Table 4: Response from one-minute feedback (Students)

From the feedback, it was found that students generally liked the videos and the wide variety of information sources covered in the customized package. The videos enabled them to learn at their own pace and provided clear steps for them to know where to find relevant information sources for the module assignment as well as future projects. The customized package also used examples that were closely related to the topics that the students were researching.

On the other hand, there were students who indicated they did not know how to interpret statistics found within the reports, or were unable to find specific information. These responses are useful for librarians in understanding information needs, for continually improving the modules, and for providing richer interactions and conversations during face-to-face instruction.

Conclusion

In delivering the online InfoLit packages and building content using different EduTech tools, SP Library attempted to enhance students' learning experience in a blended environment. By incorporating videos, animations, infographics and extended learning resources, the Library sought to excite and engage students in their learning to contextualize and apply effective information search to their domains of study, and to specific projects and assignments. With most of the content covered in the online modules, librarians now spend more time during face-to-face sessions helping students with specific difficulties, attending to questions, identifying information needs, as well as assessing student understanding of information literacy concepts.

Through convenient access via Blackboard, students can learn at their own time, pace and location. This self-directed learning mode aims to help students gain mastery of their information literacy skills, which are relevant beyond their studies, in professional and social settings as well.

As the institution continues on the journey to realise its vision of developing students to be inspired lifelong learners, the Library intends to explore new ways of imparting information literacy skills. These will include applying innovative and effective EduTech tools, as well as expanding the range of e-learning packages to more curriculum areas. In supporting our institution's vision and priorities, the Library hopes also to contribute to the Government's SkillsFuture objective of training students to acquire the necessary knowledge and skills for lifelong learning.

References

Ajith, P. (2015). KESHAVA-Holistic Employee Selection Framework in the VUCA World. *SCMS Journal of Indian Management* (October - December), 5-18.

American Library Association. (2000). *Information Literacy Competency Standards for Higher Education*. Retrieved April 26, 2016, from Association of College & Research Libraries (ACRL): http://www.ala.org/acrl/standards/informationliteracycompetency

Black, E. W., Beck, D., Dawson, K., Jinks, S., & DiPietro, M. (2007). Considering implementation and use in the adoption of an LMS in online and blended learning environments. *TechTrends, 51*(2), 35-53.

Brown, K., & Malenfant, K. J. (2016). *Documented Library Contributions to Student Learning and Success: Building Evidence with Team-Based Assessment in Action Campus Projects*. Chicago: Association of College and Research Libraries.

Csikszentmihalyi, M., Rathunde, K. R., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure.* New York, N.Y. : Cambridge University Press.

Eymann, T. (2016). The Uncertainty of Information Systems: Cause or Effect of VUCA? In O. Mack, A. Khare, A. Krämer, & T. Burgartz (Eds.), *Managing in a VUCA World* (pp. 227-240). Switzerland: Springer International Publishing.

Flaherty, L. M., Pearce, K. J., & Rubin, R. B. (1998). Internet and face to face communication: Not functional alternatives. *Communication Quarterly, 46*(3), 250-268.

Government of Singapore. (2016, April 15). *SkillsFuture*. Retrieved October 17, 2016, from Ministry of Manpower: http://www.mom.gov.sg/employment-practices/skills-training-and-development/skillsfuture

Government of Singapore. (2016, November 11). *SkillsFuture*. Retrieved from http://www.skillsfuture.sg/

Ministry of Education, Singapore. (2015, April 16). *21st century competencies*. Retrieved October 17, 2016, from Ministry of Education, Singapore: https://www.moe.gov.sg/education/education-system/21st-century-competencies

Pham, H. L. (2012). Differentiated instruction and the need to integrate teaching and practice. *Journal of College Teaching & Learning, 9*(1), 13-20.

Ross, M., Perkins, H., & Bodey, K. (2016). Academic motivation and information literacy self-efficacy: The importance of a simple desire to know. *Library & Information Science Research, 38*(1), 2-9.

Singapore Polytechnic. (2016). *Mission and Vision*. Retrieved October 17, 2016, from http://www.sp.edu.sg/wps/portal/vp-spws/spws.org.abtsp.corporateinfo.missionandvision

Wilson, C., Grizzle, A., Tuazon, R., Akyempong, K., & Cheung, C.-K. (2011). *Media and information literacy curriculum for teachers.* Paris: United Nations Educational, Scientific and Cultural Organization. Retrieved from United Nations for Educational, Scentific and Cultural Organization: http://www.unesco.org/new/en/communication-and-information/resources/publications-and-communication-materials/publications/full-list/media-and-information-literacy-curriculum-for-teachers/