

Transforming Information Literacy Programmes – A Design Thinking Approach

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Abstract

In today's information ecosystem, the abundance of information choices and the prevalence of fake news and online falsehoods make information literacy a critical survival skill. Recognising the need to develop info-savvy students to prepare them for the 21st century workplace, a polytechnic library in Singapore seeks to redesign its information literacy programme by employing innovative solutions in an increasingly complex learning landscape. This paper describes the Information Literacy Programme of Nanyang Polytechnic Library. Applying the design thinking concept, the library planned, developed, implemented and reviewed user-centric solutions to integrate the information literacy e-learning modules into the schools' curriculum. From face-to-face training to e-learning to blended approach with experiential learning through gamified activities, the library collaborated with academic schools within the Polytechnic to optimise learning outcomes. Through the enhanced use of ICT and the application of integrated pedagogies, more learners benefitted from the information literacy programme, both in terms of reach and impact.

Keywords:

information literacy, academic libraries, e-learning, educational technology, blended learning, experiential learning, design thinking

Introduction

Today's dynamic information environment creates convenience as well as challenges to information seekers. While one can find information easily by simply articulating a question or command, the abundance of information choices with varying degrees of credibility, adds complexity to the task of information search. The ability to navigate through a myriad of information that one is faced with has increasingly become a crucial survival skill in this globalised knowledge economy (Mokhtar et al., 2009). Against this backdrop of dynamic information ecosystem, the definition of information literacy has been expanded by the Association of College and Research Library (ACRL) as "the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning." (ACRL, 2016)

While scholars and experts have endorsed the importance of information literacy (Foo et al., 2013), it remains a challenge to convince learners that searching for reliable and useful information requires more than a single click. Today's digital natives expect instant gratification and some may perceive the first few hits as being the most useful (Neumann, 2016). They also lack the skills to differentiate between quality and dubious information and are inclined to readily accept information to be accurate, regardless of the source (Jackson, 2015).

Recognising the importance of equipping our students with the necessary skills and mindset for effective search and ethical use of information, Nanyang Polytechnic (NYP) library has been actively developing and honing the information literacy skills of our students via different learning modes. This is in line with the NYP's mission and vision to empower learners for work and life, and to maximise learners' potential. Singapore Ministry of Education's Framework for 21st Century Competencies also include communication, collaboration and information skills as essential skills that students require in order to thrive in a dynamic world (Ministry of Education, Singapore, 2015). This paper describes the information literacy programme adopted by NYP library, and how it is constantly transforming to meet the ever-changing learning needs and opportunities.

The Need for Transformation

The Library has developed a generic Information Literacy Roadmap to ensure that students are equipped with the necessary information skills. The basic level targets freshmen, mainly to equip students who are new to the system with essential skills for navigating the Library Portal. The intermediate and advanced levels target students at all levels, from Year 1 to final year students, including Advanced Diploma and Specialist Diploma students. At the intermediate level, students are expected to conduct effective searches using a variety of resources, and to critically evaluate the resources found. At the advanced level, students are expected to know the basics of the Copyright Act, and to avoid plagiarism by citing resources.

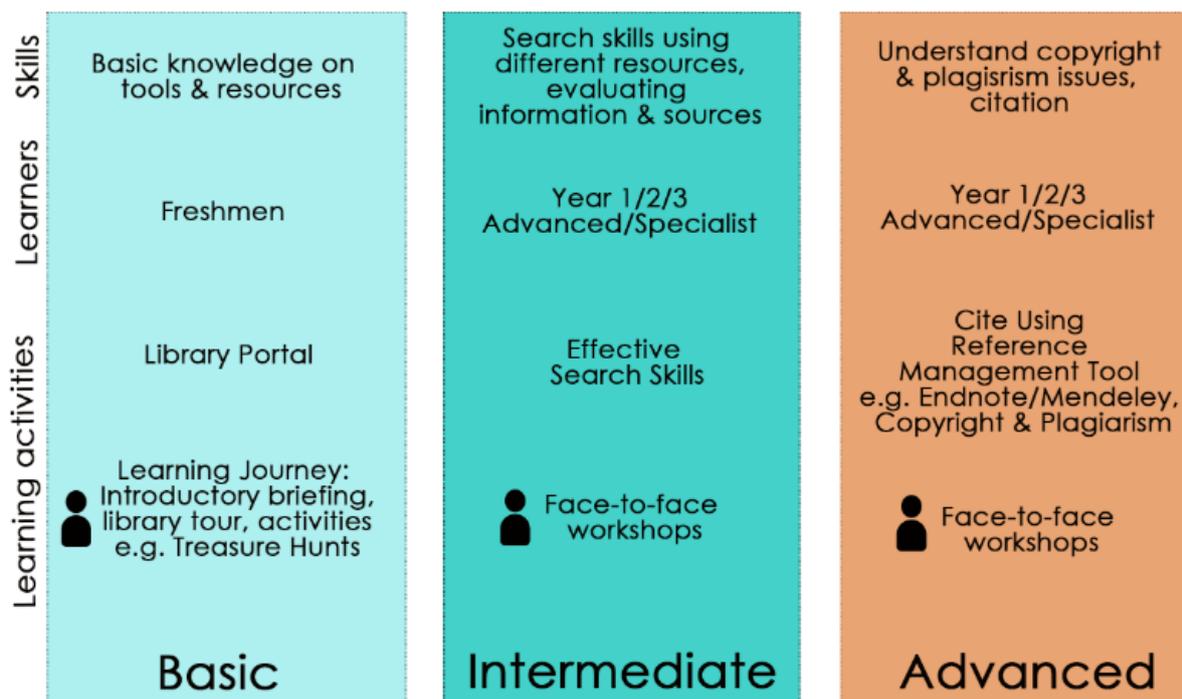


Figure 1: Information Literacy Roadmap

To equip students with the above skills, the Library regularly conducts face-to-face information literacy workshops, which include introductory sessions on getting started with the library portal, basic essentials of copyright, how to conduct effective searches, how to get started using reference management tools and customised sessions on the use of specific online resources available in the collection. The Library works closely with academic staff to organise these workshops based on their requirements. These hour-long workshops adopt a classroom instructional method which includes hands-on practice and worksheets. Although the face-to-face workshops have received positive feedback from the students and the academic schools have been supportive of these programmes, the Library recognised that the manpower and logistical constraints would not allow us to reach out to more students. This, coupled with the recognised need to employ innovative solutions to enhance students' learning experience to enable them to thrive in a complex learning landscape spurred the Library to redesign its information literacy programme.

Reimagining Information Literacy Programmes at NYP Library

One of the key recommendations of the 2010 Report of the Economic Strategies Committee (ESC) was to “instil design thinking into our workforce by accelerating the introduction of design thinking programmes and modules at local education institutions” and to “keep up efforts in the education system to inculcate a mindset of innovation amongst young Singaporeans” (Report of the Economic Strategies Committee (ESC), 2010). NYP has also incorporated the concept of design thinking into our curriculum (Chin, 2016). To transform the information literacy programmes, we adopted the design thinking methodology. The following diagram sums up the transformation process.

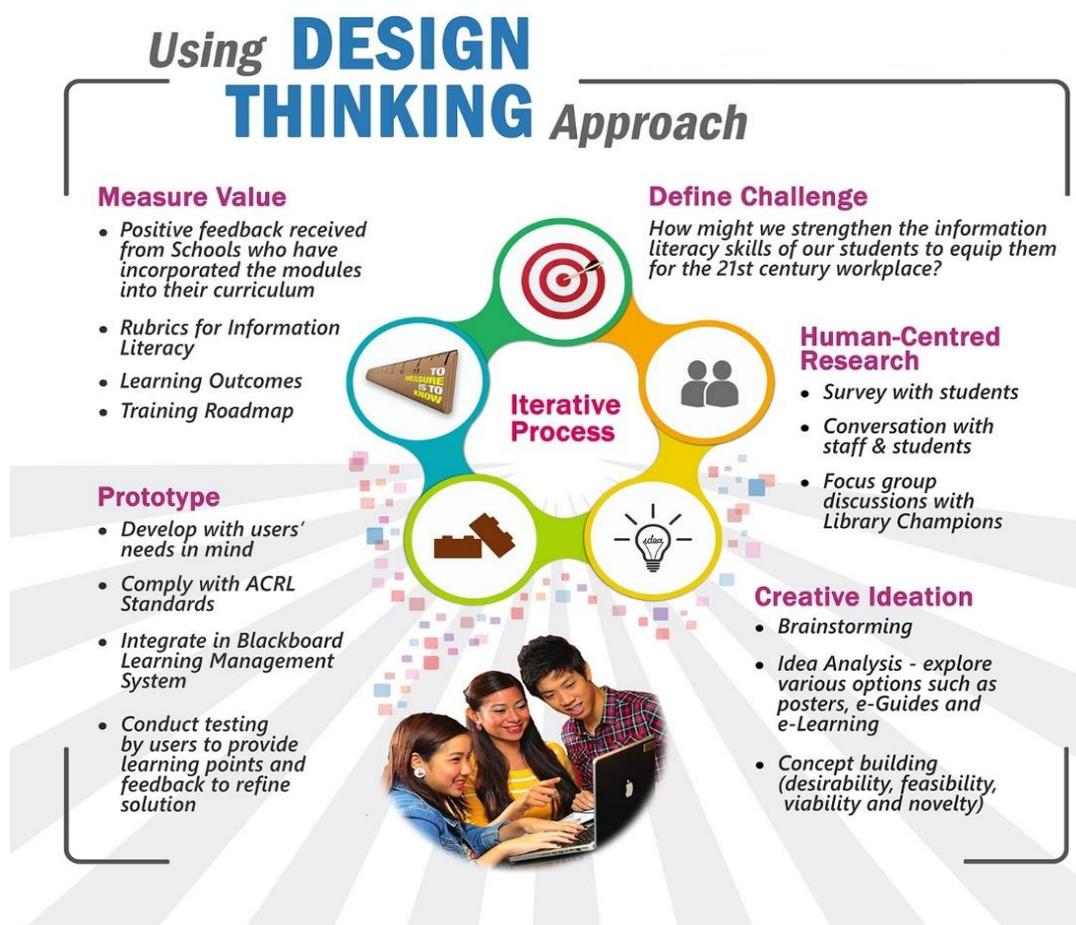


Figure 2: Using Design Thinking Approach to Redesign Information Literacy Programme

Conceptualising Possible Solutions

To better understand our students, we initiated a human-centred research study by conducting a survey with students, alongside conversations with staff and students as well as focus group discussions with student volunteers who are also known as 'Library Champions'. Adopting a user empathy approach to assess the users' needs for an effective information literacy programme, these sessions were designed to discover the users' preference on the mode of delivery. The survey findings revealed that most respondents preferred dynamic presentations such as video-tutorials.

The Library next progressed to the creative ideation phase by brainstorming, idea analysis and concept building. We explored various possible options such as using posters, e-Guides and e-learning. The outcome of these sessions led to the proposed solution: to develop e-learning modules which include bite-sized video tutorials with quizzes to be delivered via NYPs e-learning platform (Blackboard), where students could access the modules as part of their curriculum. Upon completion of the prototype, the Library met with the academic schools to showcase the e-learning package to obtain buy-in for integration into the curriculum.

Potential benefits identified:

User-centric solutions. The study of cognitive learning process combined with the power of educational technology has revolutionized teaching and learning experiences (Boettcher &

Conrad, 2016). With online learning, learners interact with rich dynamic media in a self-paced, self-directed mode. The increased learner control and interactivity enhanced learner engagement and reinforced retention. Learners can pause and revisit the content anytime as needed, and fun activities such as games and quizzes provide instant feedback in an engaging way. The use of different digital formats, such as interactive slides, gamified activities and animation appeal to different types of learners. For example, animation and music cater to auditory and visual learners. E-learning also provides potential for blended and/or flipped learning for students to enhance their learning experiences.

Enhanced Efficiency. With asynchronous online learning, learning is not limited to a specific time and space. Manpower and logistics are freed up for better efficiency. The Library can now reach out to more learners through remote learning. The Library can work with the individual academic schools to integrate the information literacy e-learning module into a common module taken by all students. With seamless integration into the school's curriculum, the information literacy e-learning modules can be made available to all students.

Harnessing Technology. The Library could easily upload the e-learning modules in Blackboard, the online learning management system(LMS) that is widely used in NYP. Students are already familiar with this platform and no further training is needed. Furthermore, the Library can tap on some of the campus's licenced e-learning softwares such as Powtoon, Articulate and Office Mix to create and integrate the learning objects.

Developing the Prototype of Information Literacy e-Learning Modules

A prototype consisting of 3 modules, namely, Library Portal, Effective Search Skills and Citation and Referencing was developed and mapped to the Information Literacy Competency Standards for Higher Education by ACRL (American Library Association, 2000).

Library Modules	ACRL Standards
Module 1: Library Portal	1. Determine nature and extent of information needed
Module 2: Effective Search Skills	2. Access needed information effectively and efficiently
	3. Evaluate information and its sources critically
	4. Use information effectively to accomplish a specific purpose
Module 3: Citation and Referencing	5. Understand economic, legal & social issues of use of information. Access & use information ethically and legally.

Table 1: Mapping of Information Literacy Modules to ACRL standards

Module 1 addressed Standard 1, i.e. determine nature and extent of information needed. Module 2 addressed Standards 2, 3 and 4, i.e. access needed information effectively and efficiently, evaluate information and its sources critically and use information effectively to accomplish a specific purpose. Module 3 addressed Standard 5. i.e. understand economic, legal and social issues of use of information; access and use information ethically and legally.

Each module included specific learning objectives, instructions, bite-sized video tutorials, quizzes and summaries to access and reinforce learning. They were sub-divided into digestible parts. The quizzes were designed to espouse competency-based learning whereby students were allowed multiple tries and were not allowed to be able to proceed to the next level unless all questions were answered correctly. Students could also submit a feedback survey upon completion of the e-learning modules. The academic schools could select the modules which were more useful and relevant to them. The prototype was presented to users and the Library Champions, and further enhancements were made in response to the feedback given.

Pilot Implementation

Having developed the prototype, the Library initiated meetings with academic schools to showcase the e-learning modules, and to work out possible collaborations. Further enhancements were made to the e-learning modules based on the feedback from academic staff.

The library implemented a pilot run with the School of Business Management (SBM) which identified “Effective Business Writing Skills” (BM0022) as the core foundation module for the information literacy e-learning modules to be infused into their curriculum. The library’s information literacy modules (2 & 3) were embedded into the course module’s e-learning package. In the first semester of Academic Year 2016, the library reached out to 70% of students taking the course module through e-learning, with half of the cohort taking the module each semester. According to the online feedback survey upon completion of the e-learning modules, 85% of the students found the e-learning modules useful, relevant and engaging. They also gave feedback and suggestions for the team to enhance the current version of e-learning modules.

The library continued to work with other academic schools to integrate the e-learning modules into their curriculum. Revision to the e-learning modules were made in response to users’ feedback and response. Modules 1, 2 and 3 were revamped to include more graphics, content was enriched to provide more clarity. Content for module 3 was completely replaced. In addition, a fourth module, Copyright and Plagiarism was developed to provide basic information on how to avoid copyright infringement and plagiarism.

Collaboration with SBM on blended approach for information literacy

The library’s pilot run with SBM met with great success and gave rise to more opportunities of exploring other pedagogies to further engage students to hone their information literacy skills.

Experiential learning has gained increased interest where learners create knowledge through experience (Kolb & Kolb, 2005) and transforming and understanding that experience (Ryan, 2014). Blended learning enables online learning experience to enrich the physical ones and vice versa (Horn, Staker, & Christensen, 2015).

Integrating these two approaches with gamified activities, SBM initiated a strategic learning collaboration with the library to prepare students for the digitised knowledge-based workplace. This collaboration effort first took place in Academic Year of 2017 and it is still going strong.

Students were asked to complete the e-learning modules and attend a 90 min experiential learning workshop which took place during the Business Research Week. The workshop which was conducted in the library consisted of 2 segments. Librarians took on a co-teach role in introducing relevant library resources and citation management tools and led the hands-on practice for the first segment. The second segment included gamified group activities led by SBM lecturers and co-facilitated by librarians. These activities included scenario-based tasks such as searching for information on books/ebooks/databases based on clues, critically evaluating information for accuracy and cross-references, detecting fake news, etc. Students were also asked to determine if the paragraphs were fake or plagiarised, and how to correct them to avoid plagiarism. For fake news, they would have to locate the original source to determine the doctored information.

Feedback from Students

A survey and oral feedback were collected from the students with the help from SBM academic staff. In AY2017/18 Semester 1, 429 students responded to the survey, and in Semester 2, 341 students responded.

Survey findings showed a positive impact on learners. As shown below, majority of the students strongly agree or agree that their knowledge and skills increased as a result of the training, and that the knowledge and skills gained can be applied to their assignments/projects/studies.

	Semester 1	Semester 2
Survey Questions	Strongly Agree/ Agree	Strongly Agree/ Agree
My knowledge and skills has increased as a result of this training.	82%	88%
The knowledge and skills gained through this training can be applied to my assignments/projects/studies.	89%	92%
Overall, the e-learning is useful.	86%	89%

Table 2: Percentage of students who “Strongly Agree” or “Agree” to the survey questions

Students were also asked to give comments or to suggest areas for improvement. Based on the oral feedback received from students, they find the workshop well designed, enjoyable and the e-learning interactive.

- “I was able to learn a lot during the NYP Library Session regarding which sources to use and using proper citation.”
- “Courses are well designed to facilitate learning.”
- “The library session was enjoyable and the steps were easy to follow.”
- “E Learning is very interactive.”
- “To allow students to have lessons in the library for future lessons to further understand the use of the library. This will allow students to hands-on with related modules.”
- “Everything was straight forward and easy to understand.”
- “Meaningful and worth the visit to the library.”

In addition to the feedback received from students, academic staff from SBM also noticed that the students have shown improvements in terms of their cited resources and abilities to

articulate and conduct different search strategies. The tutors also noticed that the students showed greater levels of engagement and made greater use of databases for research.

Learning Journeys and Use of Social Collaborative Tools

Besides online and blended learning, the library also redesigned freshmen orientation. Freshmen are no longer required to attend passive sit-down sharing sessions. Instead, they participate in engaging activities such as a treasure-hunt and bingo game challenges that include going to specific locations of the library and performing related activities. The library also included the use of game-based social collaborative tools like Kahoot and Mentimeter during workshops and learning journey activities, to actively engage students and to enhance the learning outcomes. Through such group-based activities that offer increased social interactions with fellow groupmates, freshmen get to know the library better in a fun and engaging way.

The Revamped Information Literacy Roadmap

The Information Literacy Roadmap has been revamped to include the various learning activities:

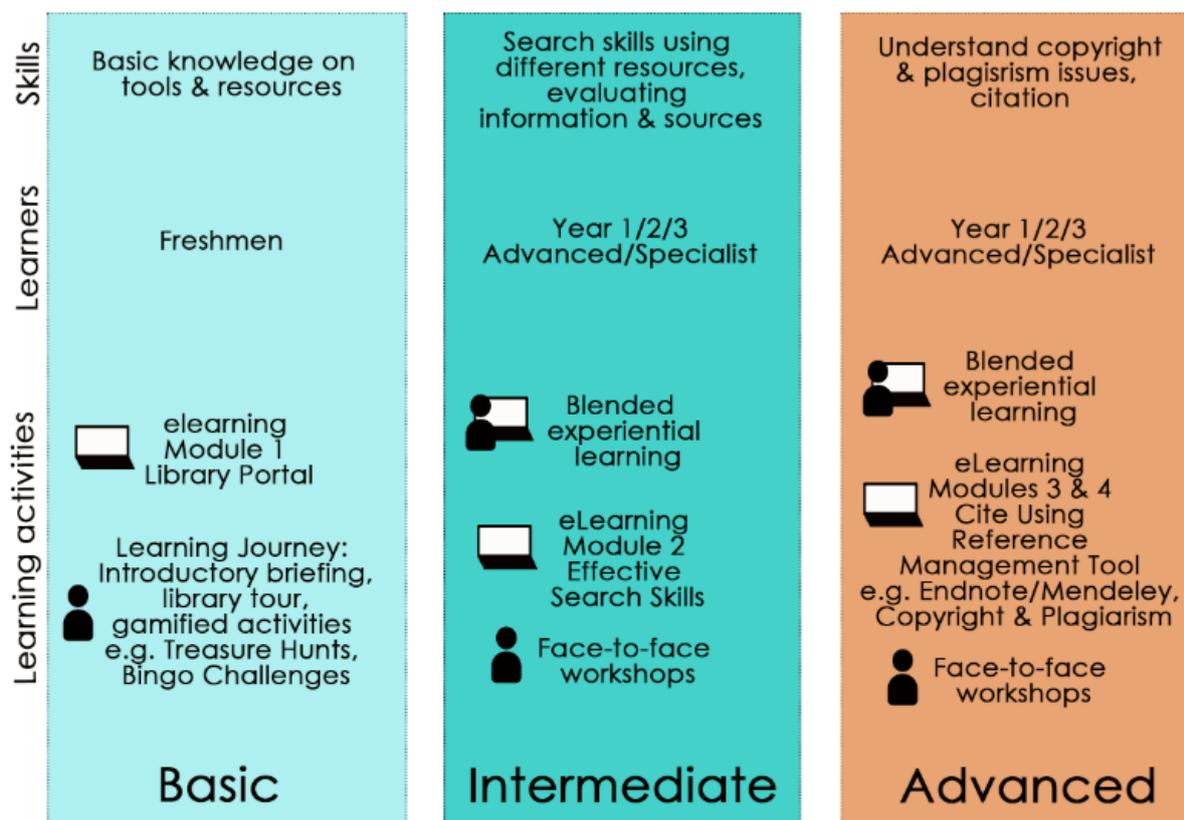


Figure 3: Revamped Information Literacy Roadmap

Academic schools will work with the library to select the most appropriate learning activities for each level. These may include gamified activities, e-learning, face-to-face workshops, briefings, tours, blended experiential learning or a combination of learning activities.

Strategies for the Future

The transformation of information literacy programmes is a continuous effort. Moving forward, NYP library seeks to enrich learners' experience by developing scenario-based content to further engage them in specific tasks for more contextualized learning. Taking on a blended or online learning approach to cater to the school's unique needs, microlearning objects will be made available too. Adopting a more agile, rather than a one-size-fits-all solution, a plethora of learning objects will be offered, catering to different competency levels and needs. The library will apply and review innovative EduTech tools, expand our scope and review our existing content for an inspiring and enriching learning experience. The library will continue to work closely with our students and staff, engaging them to explore innovative ways to deliver information literacy programmes in order for us to meet changing needs and learning landscape.

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