



Proliferating Information Literacy – eLearning Delivery Mode Extends Reach to IL Learners in Singapore

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Session: **93 — Information literacy meets E-learning: let's talk about interconnections and outcomes — Information Literacy with E-learning Special Interest Group**

Abstract:

The National Library Board (NLB) Singapore embarked on a five-year project in 2006 to deliver Information Literacy (IL) training using eLearning technology. 26 eLearn courses with content covering various core areas of IL were developed for students, educators and parents. Several instructional design principles were applied in the courseware development process to ensure learning outcomes are achieved. Partnerships were formed with strategic partners to market the eLearn programmes to a wider audience. As a result, NLB was able to reach out to more learners who were less actively engaged in IL learning previously. New opportunities have since surfaced as more eLearn technologies emerge, and NLB could leverage on these to further its reach in IL training.

1. Teaching Information Literacy (IL) Through Classroom-based Training

Libraries have traditionally taken on the role to equip users with skills to find, evaluate and use information. Since 1998, the National Library Board (NLB) Singapore has launched several programmes to teach Information Literacy (IL) skills through structured classroom training. These programmes include:

- *Be InfoSmart*, a free library orientation programme that introduced NLB library services and resources to general library users and students who visited the libraries for class visits;
- *Basic Information Literacy Training*, a fee-based programme which introduces students to the Internet as a research tool for their school assignments, and
- *InfoPaths*, a fee-based, customised thematic IL training mainly targeted at corporate clients.

However, all the programmes had to be scaled down eventually due to the heavy demand on staff resources, logistical challenges and clients having limited budget (Narayanan and Munoo, 2003).

In 2005, NLB set up the National Library Board Academy (NLBA), a department dedicated to nurture people on finding and using information more effectively in their daily lives. The NLBA restructured some of the earlier IL training programmes and offered classroom IL training to students, educators, general public and library workers. The trainers' pool was expanded through encouraging more staff to contribute some of their work time as staff trainers, as part of their professional development. These are fee-based, hands-on training programmes that aim at enhancing and deepening learners' IL skills, on top of the free introductory level user orientation programmes conducted by the National Library and Public Libraries.

The IL programmes for students were very well-received, as Singapore school curriculum requires students from Primary three and above to complete inquiry projects on selected topics as part of the coursework. The ability to find, evaluate and use information effectively is therefore essential to the completion of these project assignments. Since most primary and secondary schools in Singapore are not staffed with a Teacher-librarian, the schools looked towards the NLB to conduct such IL training for their students.

As the demand for IL skills training for schools grew, NLBA again faced the issue of not having enough trainers to meet the schools' training needs. The issue was further aggravated as schools usually prefer to hold the training within the same window period in the academic year, instead of spreading over the academic year. The need for hands-on practice, and therefore access to computers with network, also limited the scalability of the training, as most computer labs only have 40 or fewer computers so we were not able to have more students in one class without compromising the effectiveness of training. There is therefore a need to find an alternative way to provide IL training that will not be limited by space, timing and availability of trainers, to proliferate IL to a bigger student population.

While it is important to educate students in IL when they are young, so that they will grow up to be IL savvy individuals, NLB also recognised the need to equip teachers and parents with IL skills, so that they can coach and guide their students and children in the information search and use process. Being equipped with IL skills will also enable these adults to work more effectively in the new knowledge-based economy, dealing with the exponential growth of information on the Internet and other technology platforms. In view of the busy schedule of the parents, who are mainly working adult, the training must be made available anytime and anywhere, for them to access whenever they are free.

2. Proliferating IL Training with eLearning Technology

eLearning, also known as online learning or web-based learning, was identified as the possible delivery platform due to the flexibility it offers. Learners are able to attend a course anytime, from anywhere, regardless of their work schedule, and even when they are travelling out of town. Learners are also able to set their own pace of learning, repeat segments that they are not familiar with, or skip segments that they already know. eLearning could also potentially be cheaper for the individual, as the cost of offering the courses could be recovered from a wider base of learners. Most importantly, with sound instructional design

principles applied, learners could achieve the learning outcomes through interactive activities, without the need for a trainer/instructor. This will help NLB to proliferate IL training to a wider audience.

A proposal for a five-year IL eLearn project was submitted and approved in 2006 as part of NLB's Library 2010 Master Plan. One of the project objectives was to equip school students, teachers and parents with IL skills, using eLearning technology. The expected outcome would be information literate Singaporeans who are savvy in locating, evaluating and using effectively the information required for various purposes, be it for work, school research or their daily lives.

The project would develop bite-sized eLearn IL courses and make them accessible to learners anytime, anywhere. These courses would be managed and usage tracked by adopting an eLearning Management System (eLMS) that is readily available in the market, so as to reduce development and maintenance costs. As such, the eLearn courseware should be developed according to SCORM (Sharable Content Object Reference Model) technical standards, to ensure interoperability of the courseware on any eLMS chosen. As learners are to be charged a fee for accessing the courses, to partially fund the project so that it could be more sustainable in the long run, an ePayment feature had to be added to the eLMS so that individuals could register and pay for the courses online.

3. Identifying eLearn IL Topics Using NLB's IL Competencies Model

Part of the project deliverables was to develop and make accessible 26 IL eLearning courses, each lasting two hours, over five years. These courses are to equip learners with competencies in the following four key core areas:

- *Resource skills* – introduction to various information sources available (print and electronic) in the library as well as the more authoritative ones on the Internet. This will help equip the learners to be independent and effective library users and researchers.
- *Research skills* – effective information search strategies and techniques, as well as basic research methodology for gathering primary data.
- *Critique skills* – evaluation of information obtained based on authoritativeness, accuracy, timeliness, etc.
- *Publishing skills* – putting together and presenting the research results.

The four core IL skills above were identified in an information literacy model developed by the NLB Academy. (National Library Board, 2007).



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Out of the 26 courses, 16 courses were developed for students, while 10 courses were developed for teachers and parents. The topics for students were determined based on past IL training requests from schools. The topics for teachers and parents were determined based on the knowledge and competencies required for them to support and guide their students and children in the information search and use process. See appendix 1 for the list of courses.

Most of the 26 courses address beyond the basics of IL, i.e. information sources and information seeking strategies. While there are 18 courses covering Research and Resource competencies, 22 ventured beyond that to address the Critique and Publish competencies, especially the Critique competencies. The project team has perceived the ability to evaluate and critique information as a key competency that the general population should acquire, due to the information overload caused by penetration of Internet and new media tools into our daily lives.

Out of the 10 courses for teachers and parents, the project team translated three courses into Chinese, in order to reach out to parents who are not fluent in the English language. The team also developed two thematic IL courses (Recipe for active retirement and Job seeker 2.0) to teach resource and research competencies through focusing on tasks related to the themes.

4. Ensuring IL Learning Outcomes are Achieved

Earlier studies suggested that eLearning as a mode of learning has no significant influence on learning outcomes. Instructional design seemed to be the primary factor affecting the effectiveness of learning. (Johnson and Aragon, 2002). As such, the project team enlisted the help of an instructional designer to ensure that sound instructional design principles and methodologies were applied in the course development process. With the advice of the instructional designer, the following design principles were applied:

4.1 Allow individual control of pace and learning activities

Navigation buttons were provided for learners to repeat or fast forward segments. Learner can also click on the menu at any point of the course to restart the course, module or particular learning activity. A resource tab is available for learners to refer to additional references e.g. bibliographies, glossary and interesting related facts.

4.2 Address various learning styles

Course content were presented in text, audio narration, moving images, charts, games, and interactive simulations. The use of multiple tools to present information appealed to multiple senses of the learner, thus helping learners with different learning styles (for e.g. visual, auditory and kinaesthetic) in understanding and retention of the course content.

4.3 Break information into bite-size to prevent information overload

Each course was broken down into several modules and each module into several segments. Each segment was designed to be a logical start and stop point of a particular concept, lasts about 10 minutes, and ends with an assessment activity. Learners then have the flexibility to learn the particular skills when the need arises, or during their free time in between tasks. Below is a screen shot from the course Project Work Series – Smart Planning. The 2-hour course was further broken down to 6 modules, for learners to access the relevant module when the learning need arises.



4.4 Connect new information to prior knowledge

This is also known as reflective learning. Scenarios that the learner would have experienced before were presented, and questions asked for the learner to reflect on such past experiences. This process of reflection encourages interactivity, enhances learning and also helps to develop higher order thinking skills. Below is an example of the learner being asked to reflect on past experiences of information search to identify issues that they have encountered.



4.5 Create scenarios around real-life information problems

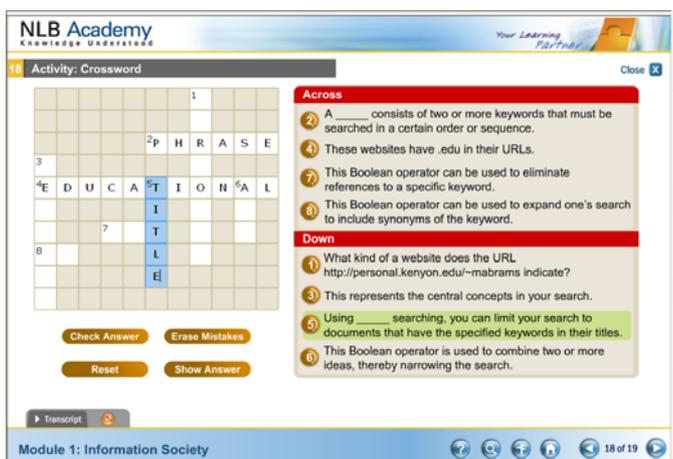
Real-life case studies are excellent teaching tools as learners would be able to identify with the scenarios and appreciate how the skills they learn in the course could be applied in real-life situations. For example, the course on Internet Search Skills used four everyday scenarios of 1) a student looking for information for a class project, 2) a housewife looking for recipes, 3) a businessman looking for market data and statistics, and 4) a doctor looking for latest updates on healthcare topics to illustrate how one could go about searching of information on the Internet effectively.



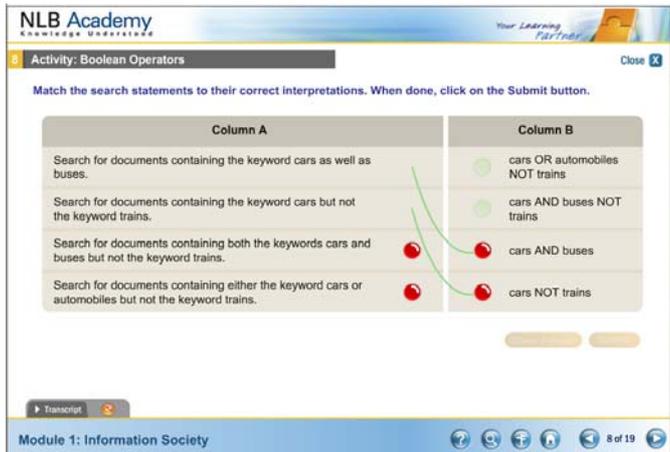
4.6 Provide hands-on activities or incorporate games

Games were used extensively as activities in the courses, usually in the form of quizzes. However, these quizzes were presented in different ways, to increase the fun element and level of challenge. Types of quizzes used include:

- Crossword puzzles
- Drag and drop
- True and False statements
- Single-answer multiple choice
- Multiple-answer multiple choice
- Fill in the blank(s)



An example of a crossword puzzle on Internet search skills.



An example of a drag-and-drop matching game on search strategies.



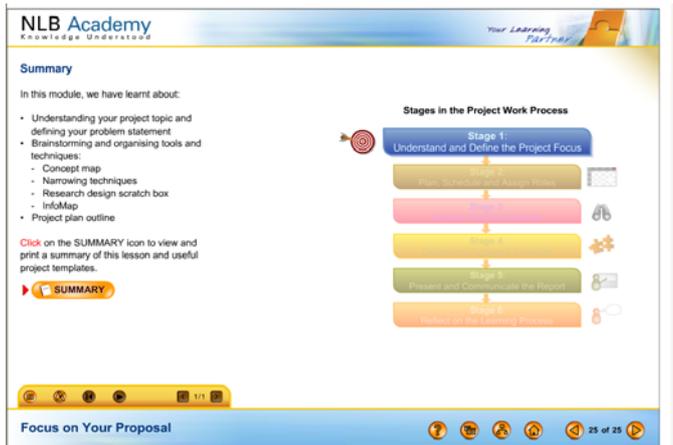
An example of a true-and-false statement quiz on project skills, presented as a dart game.

4.7 *Check understanding at intervals*

Learners are constantly tested throughout the course to determine if the learning outcomes were achieved. These “tests” were incorporated into the courseware as games and quizzes (see 4.6 above) and also serve as activities or energisers to break the monotony of theory-heavy modules. Learners can choose to repeat the segments or redo the activities to reinforce learning if they did not answer the questions correctly.

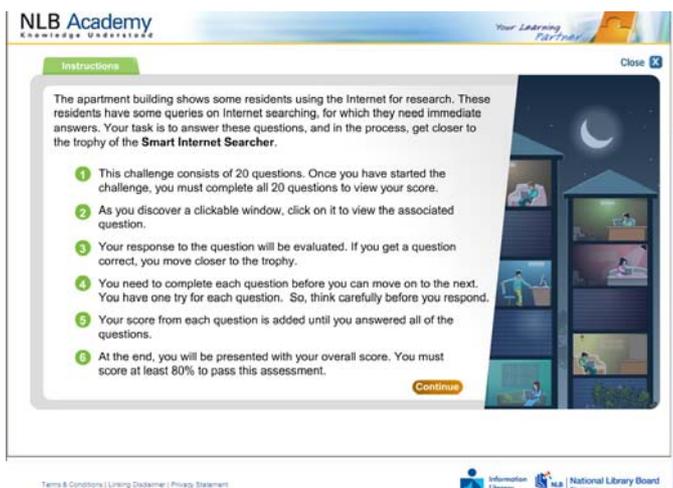
4.8 *Provide course summary and templates for future reference and use*

A summary page was included at end of each module for learner to review topics to enhance learning retention, as well as to print and take away. Where recommended templates were introduced in the course, pdf versions of the templates are also made available for downloading or printing by the learner for future use. The screen shot below shows the page where learner could click to access the summary or useful template to plan their project work.



4.9 Administer final assessment

The learner would need to answer an online assessment of 20 questions at the end of the course to test their understanding. Learners who achieve a minimum score of 80% will be able to print a Certificate of Achievement issued by the NLB Academy. When the learner does not answer the question correctly, they are able to go back to the questions and view customised feedback or tips provided to understand where they have gone wrong.



Instructions page for the final assessment for the course Internet Search Skills.



Results page of the final assessment, where the learner could click on the question's number to view the correct answer and explanations.

5. Forming Partnerships to Market IL eLearn Courses

5.1 *Start small and trial with past supporters*

The project team adopted a conservative marketing approach in the initial years of the project, due to the following considerations:

- eLearning was a new area for NLB and the team needed time to resolve any system issues faced by the learners.
- While Singapore schools have started embracing eLearning after the SARS epidemic in March 2003¹, schools are still adopting a blended approach, i.e. eLearning as a component that complements classroom teaching and not a standalone course.
- As the NLBA IL eLearning is a fee-based service, not all schools have the budget or know-how to seek funding support for students to attend the courses.

As such, the marketing team only reached out to schools that have sent students to NLBA's classroom-based IL courses before, for a start. These schools were also more convinced of the need for IL training, as they have experienced the classroom-based IL training and have seen the benefits.

5.2 *Participate in community events for the masses*

Promotions of the eLearning courses to schools were stepped up in 2009, when development of most of the 26 courses identified were completed. The promotions team made presentations to school Principals or Head of Departments in-charge of inquiry projects to get their buy-in, and also participated at educational conferences and exhibitions organised by the Ministry of Education, to reach out to teachers and parents. The enrolment to the eLearning courses grew steadily as a result.

In order to reach out to more parents, the promotions team decided to showcase the courses at community events targeted at the masses, to raise awareness of IL and encourage registration for the courses. To this end, the team worked with multiple partners to participate in their events targeted at the masses in various communities. Some of the key partners include:

- Media Development Authority² of Singapore (Media Fiesta and roadshows for general public),
- People's Association³ (Family Carnivals for residents),

¹ In March 2003, there was an outbreak of Severe Acute Respiratory Syndrome (SARS), a condition characterized by both an atypical pneumonia and efficient airborne transmission, in Singapore. The Ministry of Health in Singapore invoked the Infectious Diseases Act to quarantine all contacts who have been exposed to SARS patients, and schools were closed for 18-day to contain the spread of the SARS virus. This led to schools exploring and embracing eLearning as a mode to deliver lessons to pupils remotely.

² The Media Development Authority (MDA) is a government statutory board that champions the development of a vibrant media sector in Singapore, as well as formulating regulations governing media content and different delivery platforms. It also reaches out to the community to educate the public to be better informed when accessing and using media content. See <http://www.mda.gov.sg/AboutUs/Overview/Pages/default.aspx>.

³ The People's Association (PA) is a government statutory board that promotes harmony and cohesion in the community. It offers programmes and services that cater to the needs and interests of Singaporeans from all walks of life through Community Clubs (CCs) located in the residential towns. See <http://www.pa.gov.sg/about-us.html>.

- The National Trade Union Congress⁴ (roadshows for union members and residents who require union assistance) and
- public libraries under the management of NLB (BookExchange and other reading promotion events for general public).

NLBA's participation in these events successfully raised awareness of NLB and its eLearn courses, which in turn attracted enrolment from visitors to the event.

5.3 *Form alliances with strategic partners*

The breakthrough for NLBA's eLearning outreach to the schools came in FY2010, when NLB collaborated with the Ministry of Education (MOE) to design and deliver the Media Literacy Programme⁵.

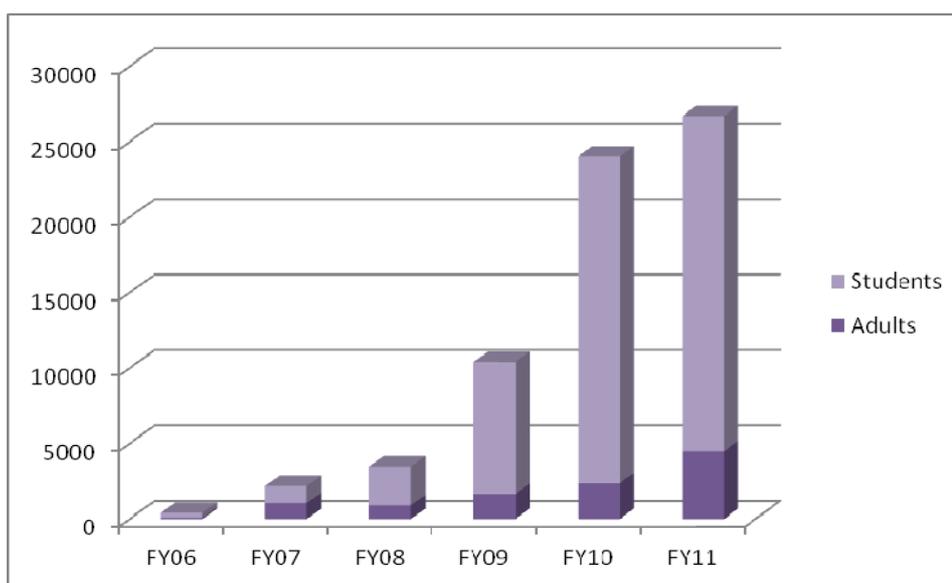
NLBA was approached by MOE to be one of the three course providers to conduct MLP for schools. Seeing this as an opportunity to promote the IL eLearning programmes to more schools, NLBA proposed a blended learning approach that offers access to eLearning courses on media literacy, to complement the classroom learning components of the MLP. Students will access the eLearn courses prior to the classroom training to gain understanding of basic IL concepts before the class. The classroom component will then focus on activities to apply skills, and internalise knowledge. MOE accepted the proposal.

With the endorsement and subsidy from MOE, response to the MLP and therefore enrolment to the eLearning courses increased significantly. As can be seen in the table and chart below, eLearning enrolment by students grew 147% from FY09 to FY10. At the end of FY11, student enrolment to the eLearning courses has grown 68 times compared to when the project was first launched in FY06.

⁴ The National Trades Union Congress (NTUC) provides leadership, services and support to promote inclusiveness across all working class, ages and nationalities. The NTUC serves over 500,000 members, owns 12 social enterprises that serve more than 1.5 million customers weekly and 4 related organisations. See <http://www.ntuc.org.sg/wps/portal/up2/home>.

⁵ The Media Literacy Programme (MLP) is a project by the Ministry of Education, Singapore starting in 2010 and ending in 2013. The aim of the project is to nurture media-literate students who are able to understand (critique) and create (publish) media products independently through a structured media literacy training programme. The MLP is a non-mandatory fee-based enrichment programme subsidised by MOE.

Number of Enrolment by User Profile for FY06-FY11



	FY06	FY07	FY08	FY09	FY10	FY11
Adults	89	1058	904	1653	2358	4482
Students	328	1122	2578	8756	21669	22221
Total	417	2180	3482	10409	24027	26703

The MLP also helped to promote IL eLearning to more teachers. While continuing to reach out to parents through community events, NLBA also promoted the IL eLearn directly to corporate clients, government agencies and other institutions. The team identified organisations that require staff to conduct research on the job, e.g. policy makers, marketing or business development personnel, as potential learners.

Public officers (officers working in Ministries and government agencies), who are required to write policy papers or project proposals in their course of work, were identified as potential learners who could appreciate the benefits of IL. The project team approached the Civil Service College⁶ in late 2009, which reviewed the courses and decided to include selected IL eLearn courses in the recommended curriculum for new public officers. The collaboration resulted in consistent sign-ups of public officers for the course throughout the year and contributed to the growth in adult IL eLearning enrolment. With CSC and MLP partnerships on board, NLBA's IL eLearning enrolment by adults grew 49 times at the end of FY11, compared to when the project was first launched in FY06.

⁶ The Civil Service College (CSC) is a statutory board under the Prime Minister's Office. Its mission is to provide training and development opportunities to public officers, for a first class public service. See <http://www.cscollge.gov.sg/page.asp?id=1>.

6. Riding on New Opportunities

By adopting eLearning as the delivery mode for IL training, NLB was able to overcome manpower, space and timing constraints to extend our reach and equip more students, teachers and parents with IL skills. To date, NLBA's IL eLearn programme has seen a total enrolment of over 67,000, a significant increase from a few hundred a year when IL training was mainly delivered through classroom mode.

Moving forward, a number of opportunities have surfaced that NLB could ride on to further extend our reach of IL training via eLearning.

6.1 MOE's 21st century competencies

MOE announced its new framework to enhance the development of 21st century competencies in students, in 2010. One of the desired outcomes of the framework is "a self-directed learner who questions, reflects, perseveres and takes responsibility for his own learning" (Ministry of Education, 2010). This would require students to be trained in the IL core areas of resource, research and critique competencies.

MOE is currently working with NLB to incorporate IL into the main curriculum, as well as to equip all teachers with IL skills and knowledge, to impart IL skills effectively to their students. It was estimated that at least 20,000 primary and secondary school teachers need to be trained in IL skills over the next two to three years.

It would have been near impossible to train 20,000 teachers via classroom training mode, in such a short timeframe and yet achieve learning effectiveness, without significant additional investment in manpower and other resources. However, with eLearning as an option, teachers could be given access to the courseware after attending a mass briefing to deepen learning. New teachers could also be put through a similar programme subsequently, to ensure IL knowledge is acquired just-in-time.

6.2 eLearning as a utility application on the desktop for subscribers

While the marketing team will continue to market the courses to the masses at community events, the team will also step up our efforts in working with corporate clients to proliferate IL training to their staff. One possible new business model is to offer access to IL eLearning based on subscriptions, like how companies subscribe to online databases. The icon to launch the eLearning Management System would then reside on all staff's desktop as a utility icon, and staff could access eLearn courses whenever there is a need to acquire or refresh certain IL skills. The marketing team is currently working on the business model and proposal for a few potential corporate clients who have expressed interest.

6.3 Collaborative learning communities

A number of instructional designers believe that interaction with other like-minded people or fellow learners help to motivate, stimulate and improve retention of learning. (Huang, 2002). NLBA's current eLearning does not have a collaborative learning component, but the team is exploring the possibility of tapping on collaborative tools such as Facebook, discussion boards or NLB's e-community platforms to enhance the eLearn experience. A feasibility study is currently being conducted, and a few prototype projects are being planned.

6.4 Mobile devices and mobile apps

When the project started in 2006, eLearning was mainly delivered through web-based platforms and accessed on computers or laptops. With the abundance of mobile devices and mobile apps today, it is timely to relook into how eLearning could be made more accessible through such mobile devices and apps. NLB has recently set up a project team to look into developing mobile apps to deliver IL skills training, as well as adapting the current IL eLearn courseware to facilitate access through mobile devices.

7. Conclusion

Developments in eLearning technologies have opened up new opportunities for libraries to deliver information literacy skills training in more interesting and efficient ways. It is important to note that the use of advanced technologies needs to be anchored upon good instructional design practices to ensure that learning outcomes are achieved effectively. Finally, the successful proliferation of IL through eLearning is also dependent on the ability of the library to convince the population of the relevance of IL in their everyday lives. It is therefore essential to identify and collaborate with strategic partners to extend the library's outreach to the population more effectively, so as to achieve a multiplier effect.

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List of IL eLearn Courses Developed

Title	Competencies
<u>For Students</u>	
1. Awareness of New Media	Resource, Critique
2. Internet searching made easy for kids	Resource, Research, Critique
3. Project work series – smart planning	Research
4. Project work series – smart presentations	Critique, Publish
5. Project work series – smart reports	Critique, Publish
6. Project work series – smart research	Research, Critique
7. Project work series – smart resources: using newspapers effectively	Resource, Critique
8. Project work series – smart resources: using the library effectively	Resource, Critique
9. Smart Internet search skills	Resource, Research, Critique
10. Responsible blogging	Critique, Publish
11. Smart research reports	Critique, Publish
12. The savvy researcher	Research, Critique
13. Avoiding plagiarism made easy for kids	Critique, Publish
14. Media literacy essentials	Critique, Publish
15. Media literacy made easy	Critique, Publish
16. Singapore resources	Resource, Critique
<u>For Adults</u>	
1. Awareness of New Media (English)	Resource, Critique
2. Awareness of New Media (Chinese)	Resource, Critique
3. Information literacy for educators	Resource, Research, Critique, Publish
4. Internet search skills (English)	Resource, Research, Critique
5. Internet search skills (Chinese)	Resource, Research, Critique
6. Responsible blogging	Critique, Publish
7. Staying safe on the Internet	Resource, Critique
8. Recipe for active retirement (English)	Resource, Research
9. Recipe for active retirement (Chinese)	Resource, Research
10. Job seeker 2.0	Resource, Research