Building Our People: A Trial on the Application of Synchronous and Asynchronous Learning Solutions in the National Library Board Singapore

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ABSTRACT

The mantra of productivity-driven growth is reiterated time and again to convince organisations that the ability to generate more output without increasing manpower at the same rate is the key to achieving sustainable growth, staying globally competitive and in turn, accelerating economic development for the nation. Employers must therefore invest in its workforce and commit to Continuing Education and Training (CET). They must also embrace blended learning to make training more accessible to its workforce. The new CET Masterplan by the Singapore Workforce Development Agency (WDA), announced on 17 September 2014, emphasized the importance of experimenting and innovating with technology to deliver training.

The National Library Board (NLB) Singapore places great demands on its workplace learning programmes. ‘Build Our People (Competency)” is one of NLB’s People Priorities and the strategic drive to develop a high performing culture and nurture an empowered workforce pushes us to explore varied modes of learning delivery. Innovative and effective learning delivery, coupled with a competency-based approach to determine the right mix of skills and knowledge, help us break down barriers of learning, engage with the learners and ensure successful transfer of know-how.

This paper describes why and how NLB applies synchronous and asynchronous learning solutions for its workplace programmes. It shares on the trial run of a Data Modelling for a Semantic Web Environment training programme, which exploited the use of Cisco WebEx for synchronous distance learning with a US-based domain expert. It talks about webinars and reveal how archived recordings together with facilitation can create great learning value. It also shares on the development of bite-sized e-Learning courses. Lastly, the paper will share on the challenges faced and propose possible solutions to overcome the limitations and achieve greater success with the synchronous and asynchronous learning solutions.

Keywords: Competency-based approach, Continuing education and training (CET), Learning and development (L&D), Learning delivery, Synchronous and asynchronous learning, Workplace learning.
1. TIME AND ATTENTION ARE SCARCE IN TODAY’S WORLD

Singapore’s Prime Minister Lee Hsien Loong in his 11th National Day Rally speech on 17 August 2014 said: “We have to help individuals to progress and upgrade after they have graduated and started work in their careers ... to develop and value every worker and create the corporate values, the cultures, the training systems within the companies” (Prime Minister's Office Singapore, 2014).

In the March-April 2009 issue of Challenge1, the then Dean and Chief Executive Officer of the Civil Service College Mr Lionel Yeo reminded all agencies and officers that “when the going gets tough, the training needs to keep going”. He expressed his concern that “training is often seen as an important activity, but not necessarily as an urgent one. When people get caught up in work, it becomes a challenge to convince them that training and development should be given priority” (Heng, 2009).

The persistence, with organisations and individuals, of the urgent displaces the important and putting out fires leaves little time is a stark reflection of the incredibly fast-paced world we live and work in. We risk losing sight of sustainability and continuity in the daily grind, and keep our eyes to what lies on the horizon only to narrowly focus on what directly (and explicitly) contributes to the bottom-line.

The mantra on training and learning from Singapore’s top leaders therefore serves to keep us grounded. It reminds us not to divert away from this area of work which is pivotal to productivity-driven growth. But more importantly, it forces us to rethink and change the way we go about doing it.

2. ACCESSIBLE TRAINING AND LEARNING WITH TECHNOLOGY

“E-learning underpins the future CET framework,” said the Minister for Manpower Mr Tan Chuan-Jin in his opening address at the Adult Learning Symposium 2014 on 10 July 2014 (Ministry of Manpower, 2014). He emphasized the importance of experimenting and innovating with technology to deliver cutting edge learning solutions, and he elucidated with real-work examples of pedagogically creative e-learning which enhanced training mobility and fulfilled “just-in-time” learning.

Blended learning, as defined by The Institute for Adult Learning (IAL), “is a method of learning which uses a combination of different resources, especially a mixture of classroom sessions and online learning materials” (Soo, 2013). IAL’s Blended Learning Model (see Figure 1) comprises the goals of blended learning and a learning object strategy. The latter includes components of learning facilitation and collaboration (e.g. face-to-face presentations, classroom learning activities, self-directed e-learning, group-based e-learning) and assessment (e.g. project work).

It is undisputed that technology has greatly enhanced the accessibility of training for the learners because the flexible learning process gives them the autonomy and control to choose how they learn based on what works best for them. But what may be hiding in plain sight is that technology has also greatly enhanced the access to trainers’ competencies by the organisations.

1 Challenge is the magazine of the Singapore Public Service. It is published bi-monthly by the Public Service Division which is the central people agency of the Singapore Public Service.
Consider this for illustration: Mr Tan is a certified and very experienced Workplace Safety and Health (WSH) professional in Construction Company XYZ. On top of his hectic day-to-day operations, he is tasked to train (and re-train) construction workers on safe working practices and this takes place frequently. Today, 5 newly recruited Sri Lanka construction workers are viewing a 30-minute video, with him as a presenter, showing a variety of safety lapses observed at worksites. It includes re-enactments and simulations of dangerous and fatal accidents, e.g. collapsed scaffolding, explosions. Mr Tan was also the Subject Matter Expert (SME) consulted for the production of this training video. The learners will soon be attending a face-to-face training session with him. During the session, he will make use of online resources, e.g. digital photo galleries, web quiz. Clearly, Mr Tan’s expertise can be tapped on repeatedly by his learners and his company at great convenience, with the exception of the face-to-face session. This is because the training resources are available in a variety of formats for access from the company’s Intranet, personal portable devices (e.g. hand phones) and home electronic devices (with a copy of a CD / DVD / USB drive).

A reinforcing, virtuous circle seemingly unveils. Good utilisation of technology encapsulates trainers’ expertise and makes possible the development of pedagogically creative blended learning. Numerous learners access the content with great ease, over time and repeatedly. The organisation also taps on and makes available the trainers’ expertise with great ease, over time and repeatedly. The scalability in enabling learning and training therefore reinforces the continued use of technology to keep this critical activity going, as well as accords it the priority it deserves.
3. BLENDED SYNCHRONOUS AND ASYNCHRONOUS LEARNING SOLUTIONS IN THE NLB

Workplace learning in NLB is about competence development. Its design and delivery centre on face-to-face facilitation as the instructional design methodology and largely includes classroom training, face-to-face sharing and small group discussion. While we do combine the use of online learning with a variety of digital and audio-visual resources, these are almost always intended for asynchronous self-directed learning.

Therefore to realise the vision of blended learning, the NLB needs to bring about a fundamental shift in learning. But this goes beyond using new technologies. What really matters is the “how”. We need to assess how implementing the new way impacts trainer role, learner role, curriculum, and time and space configuration. We then need to plan and manage (be it to modify or rework) the exchanges between trainers, learners, resources and infrastructure, to ensure successful transfer of knowledge and skills. Last but not least, we need to scrutinise events and behaviours to uncover unexpected barriers to learning and to either resolve these right away or prevent future recurrence.

The following sections describe the NLB’s efforts in blending synchronous and asynchronous learning solutions. Synchronous learning simply means everyone takes part in the learning experience at the same time. Asynchronous learning means the facilitation/instruction and the learning does not happen at the same time, and learning often times is done on one’s own. Scott Nicholson’s “Technology Framework for Community Building in Distance Education” (see Table 1) offers good examples of synchronous and asynchronous methods along with its structuredness and the nature of interactions.

| Table 1: Technology Framework for Community Building in Distance Education (Nicholson, 2005, p. 231). |
|---|---|
| **External Interaction (Non course-related)—to connect local and distance students, alumni, faculty, and staff** |  |
| **Synchronous** | **Asynchronous** |
| 1-way | 1-way |
| Presentations by faculty, alumni, or guest speakers (live during residency experiences or Webcasting) | Information delivery through text, HTML, or non-streaming multimedia such as Impatica, Real, Windows Media, Quicktime, MPS, etc. |
| Structured live chat (text/audio/video); Student research poster session (during residency periods); Conference call roundtable discussion | Announcement-based mailing lists. |
| Facilitated | 2-way |
| Discussion Boards/Mailing Lists (run by school or by virtual student groups); Forum for faculty/adjunct/instructor communication |  |
| 2-way |  |
| In-person social activities (alongside residencies or during conferences and student trips) | Web pages for students, faculty, and alumni; Audio/video introductions. |
| Unstructured live chat (text/audio/video); telephone calls or video chat for advising; Instant Messenger. |  |
| Non-Facilitated | | |
| | Discussion Boards/Mailing Lists; Electronic Mail. |

Scott Nicholson’s “Technology Framework for Community Building in Distance Education” offers good examples of synchronous and asynchronous methods along with its structuredness and the nature of interactions.

2 A non-facilitated, 1-way synchronous experience would probably be a get-together which had gone wayward with one person monopolising the discussion/activity.
3.1 “Data Modelling for a Semantic Web Environment” Training Programme

**Background** The NLB librarians and cataloguers needed to have a good understanding of the concepts behind the semantic web. They have got to acquire competencies and apply know-how to transform MARC21 cataloguing and records into a new bibliographic framework that will seamlessly bring NLB’s datasets into a semantic web environment. Making these datasets available and rendering it to be consumed over this new environment is very important because it directly impacts on our ability and success to deliver core services.

**The Learning Method** 10 facilitated training sessions were conducted from 21 January to 31 March 2014 by a USA-based trainer. 9 sessions were delivered over the web with the use of Cisco WebEx. 1 session was a face-to-face session with the same trainer (coincidentally, he had to make a business trip to Singapore).

On average, each session had 25 learners and these were held at our training room which was specially reconfigured (see Figure 2). It involved: (1) 1 trainer’s desktop to project WebEx onto the big screen, (2) 1 wide-angle camera affixed to the trainer’s desktop to capture the entire class, (3) A land-line for the WebEx call to the trainer and his audio is streamed out via the room’s Public Announcement (PA) system, (4) Dedicated switch was deployed to boost bandwidth, (5) 25 laptops for each learner with in-built microphone and camera, and (6) 1 cordless phone for the learners to raise questions.

Lectures were delivered. The learners worked on individual and group hands-in activities as well as assignments. These were reviewed and discussed in length during the sessions. Q&A was encouraged, and the learners either spoke up or raised it in the WebEx’s online chat. The curriculum included slides, samples of records, worksheets, online demonstration of open source semantic web application tools (this was enabled by the WebEx’s Sharing Whiteboard function), and supplementary readings.

![Diagram](image.png)

Figure 2: Technical Configuration of the Training Room (M. W. Ng, personal communication, December 02, 2013)
Observations & Findings

The group of learners were highly cognitive individuals with very high motivation to acquire the know-how of data modelling for the semantic web. It was a very new area of work for all of them and they had a great urgency to transfer learning to real-work applications. Thus, there was a high interdependence of the learners, trainer and curriculum to ensure the above is achieved.

However, the online learning environment was not able to manifest the collaborative conditions for effective interactions. It is not about having simple dialogues to discuss and share. Rather, a social constructivist online learning environment was required for the trainer and the learners to generate deep understanding and co-construct knowledge. It is about having the reflection, analysis of ideas, critical thinking to probe and challenge understanding to take place along with the consumption of the curriculum and the trainer’s instructions. These effective interactions are to occur spontaneously.

Therefore, while we had gone through great lengths to ensure good setup and optimal utilisation of WebEx’s functionalities, the trainer’s “absence” from the classroom had a detrimental effect on the real-time group dynamics. His inability to seize the teachable moment and get an enlightened-looking learner to share, to observe and address a perplexed look, to boost the level of energy and attentiveness that had dipped, etc. posed learning barriers. Besides, there was always this natural tendency of didactic sharing as he went about zealously sharing his expertise, though he was also mindful to pause and ask for questions.

The training provider had arranged a facilitator to be in class for all of the sessions. He was very helpful and generally assisted with logistics and administration matters. Lamentably, he was not (empowered?) acting as the feedback loop between the learners, the trainer and the online chat. He could have helped, to be “the eyes and ears” for the trainer. For instance, he could have helped manage the chat window and nudge the trainer when the latter was tardy to respond to the questions and comments posted in the chat. But this requires a carefully, orchestrated plan between the two, as the last thing the learners would want is to have the facilitator distract the trainer.

Interesting, one of the learners became an "informal" facilitator. He exhibited a high degree of involvement when he readily provided complex real-work data, and actively organised the discussions and hands-on activities during the sessions and back at work. One might think that he is one of the top-ranking staff who needed to steer progress, but that is not the case. His act simply affirmed his personal commitment to the learning.

At this point, please do not be misled to think that the learners are not appreciative of the learning opportunity and the efforts taken. On the contrary, they articulated that this was probably the best way to access the expertise of this overseas-based professional, which would otherwise be impossible given the high costs to be incurred, if he was to be flown in and put on a short stay to conduct the face-to-face sessions. The learners did however suggest ways to improve the learning experiences. Trivial as it may seem at first glance, the following are important to bear in mind as the same sentiments were shared by several learners.

The charging wires for the 25 laptops posed trip hazards, but more importantly, it hindered learning because the learners were “confined” to their own learning spaces. It was difficult to comfortably discuss while in class, so more conversation were in fact conducted outside the classroom setting. The cameras in every laptop were turned off because the video streaming of the learners impacted the bandwidth and caused video and audio lag. But to put up one’s hand to raise questions, or to speak loudly into a cordless phone with a classroom full of peers while looking at the trainer on the projection screen; these are simply not natural acts and the learners felt really awkward. Coupled with some instances when the trainer was
not keeping pace with the online chat while talking about what was on-screen, the learners kind of stopped asking altogether. Last but not least, the learners could sense the trainer’s tiredness as he was training at very late hours according to the local time in USA.

3.2 Webinars, Presentations and Its Archived Recordings

Background The NLB subscribed to several webinars offered by the National Information Standards Organization (NISO) and Dublin Core Metadata Initiative (DCMI). These offered excellent opportunities for our staff to make connections across learning communities and have access to foreign domain experts, which otherwise would have been impossible for the obvious reason of high costs to be incurred – either to travel overseas or bring in the foreign expert. There is also an ongoing practice is to video record the presentations from distinguished guests and speakers at NLB’s events; similarly for selected presentations from staff at our formal events. Again, the purpose is to extend the opportunity for our staff to learn from these professionals.

The Learning Method The learners did not attend the synchronous online webinars. These were conducted during the afternoons in Eastern Time which meant past midnight in Singapore. Instead, they accessed the archived recordings in the Intranet via their office laptops. They could have accessed the live webinars, if they had wanted to, with the session ID-Password provided by NISO and DCMI via their personal or office laptops. For one special group of learners, they did it differently. They booked a meeting room, had everyone together, viewed the selected webinar, and proceeded to discuss and share. What they did was in fact organised a structured learning session. As for the presentations, the learners continue to attend the live sessions. They would access the archived recordings in the Intranet via their office laptops, if they had missed it or wanted a refresher.

Findings Accessing the archived recordings (one-way, facilitated asynchronous learning tool) on one’s own is a very self-directed form of learning. The learner is not subjected to the pressures of being “in the now”. There is little or no need to interact with the video, and unless there is a high level of commitment to complete viewing in a single sitting, it is easy for the learner to succumb to distractions. Attending to that phone call, email, or occasional chit chatting with colleague is fine because the learner can simply pause the video and return to it later. The degree of engagement is also dependent on the learner’s motivation. Is he/she expected to complete a job task or pass an assessment after viewing the video?

The above are the reasons why the archived recordings had worked more effectively as a learning tool for that special group of learners. They “configured” the time and space elements (i.e. the meeting room) to eliminate the barriers of learning and encourage learners’ dedication. They “blended” several learning tools to create a holistic, engaging and interactive learning experience (see Figure 3). Viewed from a different perspective, it also seems that the learners now have access to a learning community. It is one which they have created on their own when they embarked on this way of learning. It is almost as if they wanted to “replicate” the community they never got to in touch with when they did not attend the live webinars.

Page view statistics of the NLB’s Intranet is a proxy indicator to measure use of archived recordings. Though a direct conclusion cannot be drawn from the significantly low numbers, past feedback received from the staff may reveal tell-tale signs of why the archived recordings are not being used as much as it should be. The following paragraphs will not discuss the feedback at length. Instead, examples of visual and auditory disruptions are given and some of which were highlighted from staff.
Clark & Mayer (2011) urged the application of the modality principle for multimedia learning and e-learning. It is about improving learning by presenting words as speech and explaining graphics with audio (as opposed to on-screen text). This is because learners have the innate inclination to scrutinise everything they see on screen – colours, placement of elements, content correctness, movement, etc. An information overload is likely to occur when there is a lot happening on-screen because the visual sensory processing goes into overdrive. Applying the principle means making the phonetic processing (of what was spoken) take on some load from the visual processing, and this in turn improves attention and retention.

The following are examples of visual disruptions which can create an unpleasant viewing experience and decrease the attentiveness of the learner. From the presenter - frequent (and random) scrolling and clicking on slides / materials, uncoordinated toggling of multiple windows / applications, constant pacing up and down. From the video recording technician - rough shifting of the camera left-right-up-down, unfavourable lighting which may be too dim or too glaring, drifting focus as well as zoom in and zoom out.

The following are examples of auditory disruptions which can create an unpleasant viewing experience and decrease the attentiveness of the learner. From the presenter – monotonous and toneless voice, excessive use of filler words (e.g. um, you know, okay), unfamiliar and/or incorrect pronunciation, poor choice of words and diction, jumbled and/or incoherent sharing with what is on-screen or topic of discussion, distracting sounds like constant clearing of throat. From the video recording technical – too soft / too loud voice recording even after the learner adjusts the volume, poor noise cancellation.

3.3 Bite-sized e-Learning Courses

Background On 6 January 2015, the NLB signed a Document of Collaboration with the Civil Service College (CSC) to work hand-in-hand on its e-Learning Portal project. The strategic goal is to position e-learning as part of a holistic approach to extend learning beyond the classroom, and exploit the functionalities of a full-fledged Learning Management System (LMS). Works are in progress to develop e-learning in: (1) Crisis Management,
(2) e-Resources, (3) Ethics, (4) IT Security, (5) Procurement, (6) Project Management, (7) Service Excellence and (8) Singapore Heritage. Currently, the NLB uses face-to-face training programmes, briefings, Intranet resources (e.g. Government Instruction Manual), and online and hardcopy job aids (e.g. checklists and hardcopy handbook) to train its staff in these subject matters.

The Approach

A systematic curriculum development is adopted for each subject matter (e.g. crisis management). This means not to outrightly define the instructional method (e.g. e-learning) but focus on determining the end learner product we want to achieve – i.e. the measurable set of knowledge, skills and attitudes he / she needs to have in this subject matter in order to perform the job effectively.

The learning objectives and behaviour descriptions, using the Bloom's taxonomy, must then be accurately crafted, so as to make clear what the learners need to demonstrate after having gone through the training (see Table 2). This coherent understanding forms a strong foundation to help make learning of the subject matter easy.

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Affective</th>
<th>Psychomotor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1- Knowledge</td>
<td>To define?</td>
<td>Level 1- Receive</td>
</tr>
<tr>
<td>Level 2- Comprehension</td>
<td>To classify?</td>
<td>Level 2- Respond</td>
</tr>
<tr>
<td>Level 3- Application</td>
<td>To conduct?</td>
<td>Level 3- Value</td>
</tr>
<tr>
<td>Level 4- Analysis</td>
<td>To breakdown?</td>
<td>Level 4- Organise or conceptualise values</td>
</tr>
<tr>
<td>Level 5- Synthesis</td>
<td>To create?</td>
<td>Level 5- Internalise or characterise values</td>
</tr>
<tr>
<td>Level 6- Evaluation</td>
<td>To evaluate?</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Examples of Behaviour Descriptions Using the Bloom’s Taxonomy

Curriculum design then follows by scrutinising the content at-hand and the content to be developed. The coverage of the content, i.e. its depth and breadth, needs to be ascertained. Decisions on chunking / modularising it suitably, linking it effectively, sequencing it logically, and pitching it appropriately need to be made. These would have a bearing on the variety of instructional methods, modes of delivery and assessment strategies to be used. It would also influence the choices of learning objects (digital, non-digital, classroom, online, synchronous, asynchronous, facilitated, non-facilitated, 1-way, 2-way, etc.).

The bottom-line: These bite-sized e-learning courses will not be developed and designed in silos. On the contrary, it will be conceived in a directed manner, as part of a suite of learning solutions. It will be guided by an overarching philosophy that technology makes possible the development of pedagogically creative blended learning which achieves scalability in training (and learning).
4. CHALLENGES AND POSSIBLE SOLUTIONS

While more learning solutions are still work-in-progress, we foresee a lot of changes required to achieve pervasive adoption of blended learning. Creative and effective application of blended learning solutions challenges continuity and sustainability because it places high demands on innovation and resources due to the rapid advent of technology. In order to stay abreast of the technological developments, we will need to observe and research on the visionaries, forward thinkers and first movers. To formulate a sound strategy of technology adoption, we will need to extract insights from their success stories and experiences, and work hand-in-hand with our own information technology (IT) professionals.

Implementing new ways of training and learning require trainers and learners to step out of their comfort zone and oust the status quo. Resistance to change is therefore a stumbling block to conquer and the trail blazers will need to persevere. In order to manage this organisation-wide change, there has to be strong stewardship and transformational leadership. The pledge in this initiative has to resonate with everyone in the organisation. To support and encourage change at an individual level, rewards and incentives may be used to boost participation and celebrate achievements.

It is equally important to be vigilant and stay attuned to the psychology of how trainers and learners think and act, in order to deploy the right suite of learning solutions in a timely manner to achieve the desired results. In order to recognise and reinforce positive attitudes and behaviours, we need to study the actions and encourage it to be repeated. Collection of useful data is therefore very important. Analysis of quantitative and qualitative data uncovers insights, helps answer questions, tests hypotheses, and supports decisions.

The envisaged journey to optimally use blending learning for the strategic thrust to “Build Our People (Competency)” will be exciting and rewarding. NLB will remain anchored in its pursuit to develop a high performing culture and nurture an empowered workforce. It will strive on and excel in its competency-based workplace programmes to incorporate varied modes of training and learning delivery.
REFERENCES


