

The Australian Army soldiers' perspective of flexible learning: Reserve distance learning pilot

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Abstract

This study aims to understand the perceptions of soldiers involved in the shift to flexible learning (computer based learning and distance learning) in the Australian Army. This move represents a major shift for an organisation that has a hierarchical and authoritarian decision-making and training structures.

Interviews and questionnaires with managers, instructors and soldiers involved in flexible learning in an Army Reserve Corporal distance learning pilot course indicated the importance of understanding the organisational context and culture. Students provided reflective insights into their learning experiences that complemented Army's more outcomes based evaluation approach. This case study indicates that flexible learning development is not a simple process of introducing a computer based learning package into the organisation. It highlighted the importance of mutual adaptation of flexible learning and the organisation that reflects the learning culture, learners' needs and a constantly changing environment.

Introduction

Different organisational contexts for the provision of relevant and responsive flexible learning are not well understood due to diverse organisational goals, current and emerging trends, and their ability to maintain relevance. Knowledge of effective Computer Based Learning (CBL) has largely developed from experiences of learners and teachers in universities and colleges using interactive Internet technologies to create CBL environments that support peer-peer learning communities (Fisher, Phelps & Ellis, 2000; Hill & Hall, 2001). There has been concern that the rapid implementation of CBL in the vocational education and training sector occurred without adequate research into the underlying principles (Schofield, Walsh & Melville, 2000). There has also been criticism that online delivery of courses does not guarantee effective learning environments (Bassi, Cheney & Lewis, 1998; Sims, 2000).

In the corporate context, CBL research has been largely reported from knowledge-based industries, particularly in the U.S., where computer use is an integral part of the business (Newton, Hase & Ellis, 2002). Schofield's (2003) study of four Australian companies highlighted the need for more exploratory case study research into decision-making processes behind the development of relevant CBL in organisations. In particular, Schofield (2003) argued for more understanding of the impact of the organisational context on the adoption of CBL solutions and for broader definitions of CBL to include 'hybrid approaches' (p.164) that can be more relevant to corporate contexts than Web-based training alone. For organisations with a need for practical skill competencies, CBL development faces additional challenges (Bonk & Wisher 2000; Newton, Hase & Ellis 2000). Further, organisations moving to distance learning

incorporating CBL face challenges in understanding and supporting learners' needs in this new environment (Hawksley & Owen, 2002), while adopting creative approaches to meet organisational priorities (Hampton & Bartram, 2002).

This case study investigates Army reserve soldiers' experiences in a pilot course offering CBL by distance. This study was designed to provide an independent perspective of students' reaction and progress with the CBL delivered by distance; while incorporating Army's internal course evaluation results. Army defines courses where multiple people are trained as Collective Training; this course falls into this definition. All collective training is evaluated and seeks to assess and improve the relevance, accuracy and currency of collective training. It involves collecting and processing information to confirm the training's relevance, and identifying any changes necessary to reflect current and developing needs. Collective training evaluation is a non-linear process consisting of four elements: obtaining feedback by conducting a discussion session at the end of the course, measuring collective training outcomes typically trainee competency results, reporting collective training outcomes preparing a post course report, and corrective action with recommendations.

Thus, the independent study aimed to supplement Army's planned evaluation by focusing on factors influencing learning processes, rather than only outcomes. This represents a shift from a behaviourist approach to evaluation (What did they learn?) to a more constructivist approach (What was the learning experience?) as described by Gunawardena et al (2000). It was proposed that this approach would provide greater understanding of how the distance learning experience could be improved.

The current study was also informed by other recent studies undertaken to understand the soldiers' perspective of CBL, including: an historical document analysis and managers' perspective (Ellis & Newton, 2004); interviews with instructional designers and courseware developers (Newton & Ellis, 2004) and interviews with instructors involved in CBL. In turn, this study has informed the development of Army's flexible learning plans. Thus, an action research approach is developing with cycles of data collection and analysis informing the next stage of research (Dick, 2002).

Research method

The Army Reserve Corporal pilot course was conducted at an Army Regional Training Centre, from 16 July to 7 November 2004. All residential components of the course were conducted at this centre. The course was conducted in three phases:

1. Induction weekend: 2.5 days from 16 July to 18 July.
2. Distance learning: 7 days using CBL from 19 July to 21 October.
3. Residential: 16 days from 21 October to 7 November.

During the residential component students had the opportunity to confirm prior learning and apply the knowledge, skills and attitudes that they have gained through completing the initial training weekend and the distance learning CD-ROM packages. The distance learning CD-ROM packages covered competency units in the following areas: 'Operations' (tasks and responsibilities as a Corporal Section Commander in defensive operations); 'Leadership'; 'Training' (e.g. 'Training Small Groups') and, 'Administration' (e.g. 'Risk Management').

The main research questions were:

- What are students' overall perceptions of CBL and distance learning?
- What factors influenced learning?
- What learning strategies were used?
- What learning support was useful?
- What suggestions are there for improvements to the course?
- How does this understanding inform effective flexible learning design?

Three main approaches were used in this case study: a pre-course student questionnaire; four cycles of student phone interviews (at monthly intervals during CBL and after the residential component), and a discussion group meeting at the end of the residential period. All data were subjected to procedures that are consistent with Grounded Theory (Glaser & Strauss, 1967) methodology. This provided iterative processes of data collection and comparison to identify categories in data as they emerged.

The purpose of the pre-course questionnaire was to understand students' characteristics and how these may influence their perceptions and experience in the course. Previous interviews revealed assumptions about the homogeneity of soldiers' characteristics, such as, managers' expectations that they are the 'X-generation' and thus, computer literate (Newton & Ellis, 2004). Managers and instructors expected that Reserve soldiers to be more diverse, but there was no background information available about the students for them to base this on, indicating a bias toward accepting stereotypes. The pre-course questionnaire provided a range of Likert ranking questions and short answer open-ended questions. Of the total of 17 students who were enrolled in the course, 16 students (15 males, 1 female) agreed to participate in the study.

The aim of the interviews was to gain an understanding of learning processes for students as they progressed through the course. Initial phone interviews took about 30-45 minutes, and handwritten notes of the main issues and specific quotations were taken. These notes were coded to identify categories in data using QSR Nud*ist (2000). The interviews used a convergent interview approach (Dick, 1998). The opening questions were: 'What do you think about computer based learning and distance learning, so far?' and 'What is working and not working for you?' Students were allowed to talk about any issues they considered relevant to the course. Other questions were subsequently asked to clarify and confirm the main issues as they emerged from the interviews.

The discussion forum with students after the residential period was held in collaboration with Army's Training Centre evaluations' officer with a focus on confirming students' ideas to improve learning effectiveness.

Pre-course questionnaire results

There was a wide spread of ages from 20 to 43 years with the highest proportion (44%) in the 20-24 years group. Most students had completed the Higher School Certificate and some post-secondary qualification, with three students studying at university. They had a wide a range of working backgrounds (e.g. manual labourer,

trades, retail manager). They were motivated by both explicit motivation (promotion) and implicit motivation relating to personal development. The flexibility of distance learning was also an important motivator for some students.

While the majority of the students had access to a computer at home (81%) or in their civilian job (69%), there were some low levels of computer skills competency reported. Internet access and usage levels indicated that about half were regular ('almost every day') Internet users. Table 1 indicates students' perceived competence with computer skills. These results provide evidence of diverse computer skills that need to be considered in the design and delivery of distance learning.

Table 1: Computer tools (reported competence)

Computer tools	Mean	Standard Deviation
Email	4.63	1.45
Web browsers	4.63	1.31
Single player games	4.25	1.48
Online chat	3.19	1.91
Multiple player games	3.19	1.91
Discussion forums	3.00	2.03

(Note: 1 = 'Never Used', 5 = 'Very High': Sorted by decreasing reported competence)

Students valued the flexibility of distance learning (Table 2) particularly features that allowed them to study at their own pace and to revise. Understanding students' priorities would assist with effective distance learning design. For example, flexible CBL navigation that allows for effective revision and provision of individual study programs would be useful.

Table 2: Features of distance learning (importance)

Features of distance learning	Mean	Standard Deviation
Repeat or revise learning.	4.06	1.00
Study at own pace	3.94	1.06
Study where I like.	3.88	1.02
Study any time.	3.75	1.06
One-on-one contact with instructor.	3.63	.72
Reduce disruption to work.	3.31	1.08
Reduce disruption of time with family & friends.	3.19	1.22

(Note: 1 = 'Not important', 5 = 'Extremely important': Sorted by decreasing importance)

There was some consistency in perceptions about study skills (Table 3). These results suggest that orientation and assistance with time management and encouraging student interaction to support learning during the course would be important.

Table 3: Study skills required

Study skills	Mean	S.D.
I feel confident that I have sufficient computer skills to do the course.	4.13	1.15
I will have to be more organised for studying online than for face-face classes.	4.06	.68
I would like contact with other students while I am learning.	4.00	.63
I have good time management skills.	3.56	.73
I like learning on my own.	3.00	.97

(Note: 1 = 'Strongly disagree', 5 = 'Strongly agree': Sorted by decreasing agreement)

Thus, diversity was a characteristic of these students. They had a wide range of previous learning experiences and valued the flexibility expected from self-paced learning. The pre-course questionnaire provided useful background information about the students and their expectations that had not been previously collected by Army. It provided an indication of some of the potential barriers and motivators for these students. Understanding students' background also strengthened the interpretation of interview responses.

Interview results

As this was a relatively small group, individual characteristics and experiences were important. However, the interviews confirmed issues that were important for students as they progressed through the modules. Changes in perspectives during the course are also outlined. All respondents were reported as male to protect the confidentiality of the one woman in the group. While gender differences may be an issue in this learning environment, further studies will be required to determine any differences in perspective and experience based on gender.

Learners' characteristics

The interaction of motivation, study skills, learning styles, prior Army experiences and computer skills influenced students' perceptions of themselves as learners in this environment. The students were generally confident in August that they would complete the course due to their commitment to promotion. They were also motivated by being paid for seven days to complete the CBL modules. It was evident in later interviews that students were still motivated to get through the course but they were finding it increasingly difficult to manage their time to complete the study.

Managing time commitments of work, other study (e.g. university), family and other Reserve activities was an issue in the first month and developed as a barrier in the second and third months. Students with tertiary study experience successfully used their time management skills by allocating specific time periods to do the course. However, the two-week residential competed with university study time or clashed with the end of year exam period and all of the university students had to withdraw. Thus, providing skills in scheduling Army study with other commitments was important. Providing more flexibility in timing of residential periods would also provide more course completion options.

Previous Army experience influenced students' expectations of the course. Students with previous infantry experience were, generally, more confident that they would pass and found the CBL package useful for reinforcing their previous learning: 'This is really good. I can reflect on what I already know. It reinforces what I already know and I will have it down pat and revise'. Students with prior practical experience were also more likely to be frustrated using multi-media presentations and would have preferred more self-paced learning with control over the pace and content to be covered. Students with less Army experience were less confident of their progress and expressed a need for some practical reinforcement of their learning: 'I am very concerned. I have had no weapons experience...I am hoping that there will be time for practice at residential'. Thus, understanding students' prior Army experience and expectations would assist in designing more effective self-paced learning and practical learning reinforcement opportunities.

While most students expressed confidence in using computers, a few students experienced problems in managing computer problems, for example: login procedures, file management, software stalling, viruses and Internet problems. Students received some assistance from instructors or Army computer support or 'mucked around and fixed it' with some gaining confidence in their computer skills from this experience. Thus, while computer literacy was not an issue for using the package, trouble-shooting computer problems was an issue. Providing a basic computer skills course would assist students' confidence and ability to manage these problems and provide them with additional generic work skills.

Learning methods

It was evident that students were reflecting on how they learned, reacting to aspects of the CBL package and adopting their preferred learning methods. Most students expressed a need for doing something to assist their learning, including interacting with online activities and notetaking. The online interactive activities were also referred to positively: 'I go back through the package to do the games again-do the fun bits. I enjoy the games. I have played some of them eight times. That is what learning is about-you learn more. This is true especially for soldiers.'

When asked what was helping their learning, the most common answer related to notetaking. Students reported taking notes to help them to learn, to do the quizzes and to revise before the residential. While times suggested for completing the modules were regarded as reasonable, students were taking longer than expected to make handwritten notes (sometimes extensively) while they were going through the package. 'Writing the notes makes me slow down and read it'; 'The notes are my set of notes and I will not have to go to the package to revise' (August interviews). In later interviews they had reduced their notetaking, 'down to the more important points regarding the quiz' (September interview), and to revise. However, in October many students had not had time to revise their notes and were hoping to use them at the Residential final assessment. Thus, anxiety about long-term learning retention was an issue. Providing summative assessment of some theory competencies or practical reinforcement of practical skills within the three month CBL period would reduce this pressure.

When asked what was helping their learning most students also referred to features of the CBL modules (audio, graphics, text, animation, video and learning activities). Students tended to favour either text or audio presentations for finding answers to the quiz, indicating preferred learning styles: 'Everything is spoken. I don't have to read. I can just listen. This is the way I learn...it is easily integrated. This is how I learn at university'. Also, students identified that audio allowed for lower literacy levels: 'It reads to me-I enjoy that. I am not a strong reader'. Thus, providing text and audio options was important.

The CBL graphics were mentioned positively in terms of learning practical knowledge and skills: 'In the video you can see someone carrying out the activity which clarifies the information'; 'Multimedia media keeps you interested. It is easier to take into your mind-easier to remember-stays in your mind more'. While most students appreciated the richness and interactivity of the multimedia, some students had difficulty managing multiple sensory inputs which they found confusing and

prolonged their study time: 'I have to listen and write it down. It is not confusing-it is annoying. As I am trying to read, I find the audio annoying, distracting'; 'I find that I have to go over it 2-3 times-there is too much going on the screen.

Thus, providing an integration of learning methods allowed for a range of learning styles. In general, students found multimedia-based modules were more enjoyable and the text-based modules were quicker to go through and to answer the quizzes. Awareness of literacy levels, learning styles and learner control of some features (e.g. turning off the sound) will assist some students.

Learning Environment

Students wanted suggested completion deadlines to provide study motivation with the flexibility to negotiate changes in their progress with instructors. Quizzes were to be posted or emailed to students according to the Army schedule of CBL module completion. Course management issues became more evident towards the middle of the CBL period (September) when quizzes were not being sent to the students on time and they received conflicting messages from instructors about their management.

Problems with self-directed learning also emerged. While most of the students were keen to use the CBL modules at the beginning, they were motivated during the course by instructor contact (usually weekly) and in particular, completing quizzes. Quizzes were viewed as explicit motivations as the instructor checked them, although the students knew that they were only formative assessment. It was found that there was little distinction being made between doing the quizzes ('finding the answers'- Interview) and learning: 'I have done three modules out of eight; I am just clicking through-doing the quiz at the same time' (September interview). Many students were behind in their study in September (2-3 weeks behind the suggested timetable) and without external assessment deadlines they were less motivated to prioritise study time. By October, most students had not completed all learning activities in the modules, although most had done the quizzes. Understanding the role and impact of instructor contact and assessment on students' motivation is important. Balancing the need for control over students' progress and providing effective learning activities and feedback needs to be considered.

Concern with retention over the three-month period increased over the CBL period. While this could be considered a normal concern, not having the opportunity for effective formative assessment, particularly practical experience, was an issue. While students were reasonably confident about using the CBL package there was a desire for practice to reinforce their understanding and retention of learning for the practical assessments: 'As adult learners- needs change as you get older; you need to read it and then do it. You need to put it into practice. In face-to-face you get the opportunity to do mini tests, practical tests.'

There was acknowledgment that the CBL package provides a basis ('a heads up'- Interview) for learning practical skills. Students with infantry experience also expressed some concern about the other students managing practical aspects of the course: 'It is still a good package. It prepares them relatively well. Without the practical, it is a lot to assimilate'. To reinforce learning, students asked Reserve Unit supervisors for practice, while others would have liked to do this but thought it too difficult to organise. Unit supervisors were not familiar with the CBL package, which

discouraged support for the students' requests. Further, when shown the package, some supervisors made negative remarks about the content which further discouraged (and confused) students. Better communication and support from Units would assist learning.

There was awareness that doing the quizzes was not necessarily reinforcing learning: 'After doing the quizzes, there is still in doubt in my mind that I know the materials.' Some students were hoping to redo the package for revision, although the time this would take was mentioned as a restriction. There was a desire for time to revise at the residential before the final assessment: 'I am sure I will pass. I do have a problem remembering though. The Army usually lets you revise before the test' (October interview). Distance learning requires longer retention time than residential training when summative assessment occurs close to training (within days). Understanding learning processes required to reinforce and retain knowledge and skills is important.

Face-to-face classes were thought to provide more effective learning; however, there were advantages of CBL in terms of interest, focussing on learning and time for revision: 'Classrooms can be boring; just sitting there for 40 minutes. People go to sleep'; 'Computer based learning is a lot easier than in the classroom. It gives you time to go over what is important. Reinforce what is in your mind'. Some students could see advantages in both delivery methods. Face-to-face provided a more focussed learning environment with the discipline of an instructor and opportunities for questions and feedback and CBL provided a more flexible learning environment in terms of learning when and how quickly they learnt. Thus, integrating the features of different modes of delivery in a more blended model would provide a more effective learning environment.

Learning support

Face-to-face learning (with or without CBL) was viewed as providing more opportunities for questioning instructors to clarify understanding. Students also provided insight into their perception of Army culture that may be missing from CBL, including discipline and instructors as role models: 'With face-to-face classes, you can observe others, observe the DS (instructor)-look up to supervisors, ask: 'What am I doing right?'; 'Army courses keep you on your toes with lots of regurgitation. The DS will quiz you anytime during the day'.

Some students also found it difficult to ask content type questions over the phone or email. Long delays in replies (over a week) also deterred students from asking instructors content questions. This situation stressed some students, particularly in relation to submitting quizzes, while other students were not concerned: 'They have not contacted us, so I guess everything is OK' (September interview). However, students found the instructors approachable and helpful when contacted.

Students had each other's phone numbers and email addresses and some had contacted each other for social and learning needs (to answer quizzes). This was mostly based on geographic proximity where they were in the same Unit and met face-to-face. There was little contact between students outside of their local Unit. Lack of time and was a limitation. However, contact with other students was valued: 'Computer based learning does not have enough discussion... We were trying to find

one day where they could work together. But this was difficult with our civilian and Army work. We were going to have a study group. I would have really liked this.'

Thus, incorporating peer learning support and motivation was important. Providing more responsive support from instructors to student's inquiries and support from Reserve Unit supervisors would improve students' confidence and motivation to complete.

Conclusions

This pilot study did not provide conclusive evidence to support or criticise CBL delivered by distance. However, greater understanding of barriers and motivators influencing learning was provided. There was significant evidence within the Army's student evaluation to support the statement that distance learning did not achieve the desired learning outcomes. The content of the distance learning packages were criticised as being, at times, difficult to understand and could not be confirmed immediately through a practical assessment or access to instructors. It was noted that only ten students completed the course and three students failed to complete more than 30% of the CBL and only one student completed all CBL modules. Despite various methods of support provided to students, they were still reluctant to utilise them. Students' motivation and time management skills were seen as the key to the success or otherwise of the distance learning component of the course. Students relied on an expectation that the CBL material would be re visited during the residential phase and the course failed to allow for the coordination of the two modes of learning. Course evaluation has resulted in Army restructuring the distance learning phase to re-purpose and move the introductory weekend to a mid distance confirmatory residential weekend, recommendation of an instructor 'distance learner' workshop and establishment of a Distance Learning Manager to supervise student progress.

Issues that need further investigation include:

For students: Time management, basic computer skill requirements, managing audio/text/graphics options, notetaking/ learning styles

For designers: Understanding literacy levels, learning styles,

For managers: Course scheduling/providing flexibility, training support staff, peer support, facilitating learning retention, blending/integrating different learning modes

This research has provided Army with timely and responsive feedback that has informed the development of more relevant distance learning proposals. This case study demonstrates the importance of understanding and aligning learners' needs and organisational priorities to provide an effective flexible learning environment.

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