

UNDERSTANDING ORGANISATIONAL LEARNING IN MILITARY HEADQUARTERS: FINDINGS FROM A PILOT STUDY

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ABSTRACT

This paper reports on the findings of a Pilot Study for a longer term research project investigating organisational learning in command and control organisations in the Australian Defence Force. One of the long-term objectives of the research project is to facilitate the development of future information systems that will enable organisational learning. The aim of the Pilot Study was to determine the feasibility of observing and documenting social learning processes and to trial the use of ethnographic techniques for this purpose.

INTRODUCTION

Understanding and enabling organisational learning in Australia's military organisations is one of the objectives of the Enterprise Social Learning Architectures (ESLA) research project being conducted by the Defence Science and Technology Organisation (DSTO). ESLA is a three year research study investigating social learning within the Australian Defence Force (ADF). The Study is designed to enhance understanding of social learning within the command and control structures of the ADF and ultimately, to develop frameworks, or architectures, of the most effective social learning practices within the enterprise. These architectures will then be used to guide the development of systems that will closely support the way the enterprise learns, giving the ADF a strategic advantage in organisational learning and more tools to help achieve and maintain crucial knowledge management practices.

Social learning is a term generally used to describe learning that is done in or by a group, or an organisation, or any other cultural cluster; and to distinguish it from learning that is purely individual. For the purposes of the Study, social learning is defined to include: the procedures by which knowledge and practice are transmitted across posting cycles, across different work situations and across time; and the procedures that facilitate generative learning - learning that enhances the enterprise's ability to adjust to dynamic and unexpected situations and to react creatively to them (Senge 1992).

A Pilot Study for the ESLA Research Study was conducted over a six month period in 1998. The objectives of the Pilot were: to see if it was feasible to observe, understand and document social learning processes, particularly in military command and control situations; and to trial the use of ethnographic techniques for this purpose. The research team's findings on the ethnographic methodology are briefly discussed in this paper.

The multi-layered social learning findings derived from the Pilot Study range from observations of the detailed structured and unstructured learning processes used to propagate the communities of practice in the Pilot setting; through the models and disciplines that facilitate organisational learning; to the broader social issues of power and discipline that impinge on the effectiveness of social learning in the organisation. This paper, however, reports only on the organisational learning findings.

THEORETICAL FOUNDATIONS AND RESEARCH OBJECTIVES

In the past decade, there has been an increasing emphasis on investigating the social and organisational factors that may help the information systems industry build more successful systems. Investigation of these issues necessitates a sound understanding of organisational culture, human social interactions, communication and relationships. This reflects an increasing awareness of the importance of the social aspects of socio-technical design, particularly when it comes to understanding users' requirements. Consequently, there has been a revival of interest in socio-technical techniques, with an increasing emphasis on understanding the social aspects of work practices, and thereby giving individuals closer control over their work environment and the systems that are designed to support this work. The focus is 'user-driven' design and this is also the impetus for the Enterprise Social Learning Architectures research, which is designed to gain a better understanding of the social aspects of learning in the ADF, in order to guide the development of technical systems that will support it (Warne 2000).

The Enterprise Social Learning Architectures Research

Although the latest computer technology is freely available to ADF personnel, and large supporting command systems are frequently specified and built, the major individual use made of information system technology in the ADF appears to be for messaging and word processing. The high end laptop machines used by commanders and their supporting staff often tend to be used largely for preparing documents and for some self-developed spreadsheet or database applications. Large command systems that are specified and then delivered several years later are not

always useful to the clients for whom they were built, because the way the clients work has changed since the systems were specified (Warne 2000).

The Enterprise Social Learning Architectures research is an attempt to circumvent this problem by understanding and, eventually, modelling the successful social learning patterns that underpin collaborative command and control work. The ESLA Study is a long term project which aims to understand how personnel involved in this work learn to do their jobs, the way they use and pass on information, the way the work they are doing changes over time, the way they adapt to these changes, and how they react creatively in new situations. This is an attempt to move away from specifying systems from the point of view of information processes, or even task analysis, back to a basic understanding of how human beings work and how they learn. It is envisioned that once the components, patterns and inter-relationships of this form of social learning are identified, understood, and documented, the resulting architecture can drive the delivery of computer systems that support the way the users work. These systems could be based on intelligent software agents or on a newer form of software yet to be developed. Rather than attempting to mould the users' work habits to fit the system, it will be possible to configure the system to suit the users' most productive work habits (Warne 2000).

A related outcome of the study is hoped to be the facilitation of learning organisations within the ADF. Learning organisations are those in which people can continually expand their ability to create positive organisational outcomes, where innovation is nurtured, and where learning is a continuous, collaborative, supportive and supported process (Senge 1992). If the ADF can learn faster and better than its enemies, it will have a powerful and sustainable advantage over them.

Social Learning

While the term social learning has been used occasionally by the education and psychology disciplines, the term has been adapted and redefined for this research. The definition used is based on theories presented by Jean Lave, Etienne Wenger and the organisational learning literature.

Communities of Practice

Lave and Wenger (1991) highlight the fact that learning in the workplace is learning in a social world, that "learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move towards full participation in the socio-cultural practices of a community" (Lave & Wenger 1991:29). The learning processes involved in newcomers efficiently acquiring the necessary knowledge to be effective in the workplace are an important part of this research, because of the ADF's posting cycle. However, learning is an on-going process as work place practice develops and changes. Wenger (1998) characterises the need for members of a community of practice to adjust and adapt to changes over time and in new situations as another manifestation of learning in a social world.

Organisational Learning and Learning Organisations

The organisational learning literature also deals with learning in the social world of the work place, and it is this aspect of the Pilot Study that is described in this paper. In the current, rapidly changing business and information environment, an organisation's ability to learn and adapt to change is highly valued. According to Courtney, Croasdell and Paradise:

"when members of an organization share associations, cognitive systems and memories, organizational learning is taking place. Learning by organizations relies on the people and groups as agents for the transferal of knowledge. Over time, what is learned is built into the structure, culture and memory of the organization" (Courtney et al 1998:4)

In this way, knowledge is assimilated into the organisation and is not lost when individuals are posted out or when situations change. This relates directly to the effectiveness of knowledge management in an organisation that, in turn, has implications for the development of systems that manage organisational knowledge effectively.

Bolk et al (1996) believe that the concept of the intelligent, learning enterprise has direct implications for the type of software and systems required to support it and they argue that this support should come from group decision support systems; intelligent software agents and team based system architectures.

In his seminal work on organisational learning, Senge (1992) states that in order for organisations to maintain a competitive edge, they must be capable of continuous learning and he outlines the five models, or disciplines, that will enable this. There is a potential synergy between Senge's model of organisational learning and computer systems that facilitate and support that model.

Senge distinguishes between adaptive (or 'survival' learning) and *generative* learning, which he defines as learning that enables organisations to adjust to changing situations and enhances their capacity to create. This concept of generative learning is particularly relevant to command and control situations in the ADF and has been included in the definition of social learning for the ESLA research.

The concept of a 'Learning Organisation' has been defined and described in a variety of ways by different scholars. Garvin states that learning organisations are organisations that are skilled at five primary activities: "systemic problem solving, experimentation with new approaches, learning from the experiences and best practices of others, and transferring knowledge quickly and efficiently throughout the organisation" (Garvin 1993:81). According to Hoffman and Withers (1995), learning is an autonomous, largely uncontrollable function of being human, however, the culture in which this learning occurs is the compelling determinant of the quality of that learning. In other words, the organisational culture either supports and steers learning, or it does not; and accordingly, an organisation is either a learning organisation, or it is not. Furthermore, Hoffman and Withers believe that successful learning organisations must operate in an environment of trust and the reduction of fear; teamwork and sharing; leaders as champions of people and their ideas; and the encouragement of constant change. Charles Handy (1995) characterises learning organisations as being built upon an assumption of competence supported by four other essential qualities: curiosity, forgiveness, trust and togetherness.

The many definitions of learning organisations are, surprisingly, not contradictory. Rather, they seem to be variations on the same theme. The common factor in most of these definitions and characterisations is the belief that the key to an organisation's success and longevity is in its ability to effectively adapt to its changing environment and to efficiently nurture the growth, sharing and sustenance of the corporation's historical and dynamic knowledge. These factors are present in Senge's 1992 discourse on the disciplines of learning organisations. Therefore, Senge's seminal work was selected as one of the theoretical foundations against which the Pilot Study findings were evaluated, in an attempt to determine the extent to which these disciplines occur in the Pilot Study setting.

RESEARCH METHODOLOGY

Studies which identify the need to consider the socially constructed context in research tend to support qualitative techniques where the key analytic task is to expose the multiple layers of meaning in the social process. Since context is crucial to qualitative observations and analyses, techniques that effectively explore contextual complexities of meaning are important. The main body of techniques that fit this criteria fall under the domain of ethnographic approaches (Harvey & Myers 1995). Given the exploratory nature of the Pilot Study research, the importance of the context and the need to understand the social process of learning, ethnography appeared to be the most logical and viable form of methodology to adopt.

Ethnography is not a new research methodology; it has been standard practice in anthropology for decades. However, it is now becoming more widely and successfully used in information systems research (Myers 1999). Ethnographers try to immerse themselves in the situation they are researching, in an attempt to obtain a deeply contextual view. From this immersion, the ethnographer is able to gradually see and understand the key concepts that influence the setting being studied. Ethnographers take on a learning and interpretive role, rather than attempting to test hypotheses. The primary analytic task is to uncover and explicate the way in which people manage their day-today situations (Miles & Huberman 1994).

The Setting for the Pilot Study

The setting chosen for the study was a Wing Command of the Royal Australian Air Force Strike Reconnaissance Group (SRG). Five field trips were made over a six month period: four to the Wing Headquarters at the Strike Reconnaissance Group at Amberley Air Base in Queensland, and one to Darwin. In Darwin, personnel from the Amberley Wing Headquarters were joined by members of other Wing headquarters, to form 95Wing HQ, the headquarters formed to take the role of 'the enemy' in a military exercise (Warne 2000). In this way, the research team was able to observe the organisation under both peace and 'war' conditions.

Strike Reconnaissance Group

Much of the fieldwork was conducted at SRG's normal peacetime environment at Amberley Air Force base. Work at Amberley focuses on training, and maintaining capability. The primary mission of SRG is to conduct strike missions. Strike missions are conducted by aircrew flying F-111 aircraft. The strike aircrew consists of pilots and navigators, since flying an F-111 requires one pilot and one navigator. Members of the aircrew world may be in flying positions or ground jobs. All aircrew take on secondary ground jobs. The strike aircrew community is refreshed by new members every six months (O'Neill 1998).

Darwin Military Exercise

The 95Wing Headquarters, in Darwin, was a particularly interesting setting, as it was possible to observe how work was conducted during a war exercise, when stress levels were higher and errors and exceptions became more obvious.

The Officer Commanding (OC) 95Wing, his Executive Officer (XO) and his support staff all came from the Wing HQ at Amberley, and all had worked together as a team previously. The settings for most of the observations made of this 'war' were the Operations Room and the Briefing Room at 95Wing HQ.

The Operations Room was immediately outside the OC 95Wing's office, and, after the daily Air Tasking Directive (ATD) was received from HQAC (Headquarters Air Command), in Sydney, the Operations Room was where the Air Tasking Order (ATO) was largely constructed. The ATD reflected HQAC's daily battle directives for the military exercise, the ATO transformed these into objectives for flying Missions, the Mission Directors planned the Missions that would meet these objectives, and the Mission Commanders implemented them.

There was a table in the centre of the Operations Room, which was a focal point for producing the ATOs. At this table, laptops were available for the creation of documents, folders contained the latest paper versions of different types of supporting information, and a number of telephones were available for communicating with people in other areas on the base or in the 'war zone'. The table itself was used for checking on requirements, and conducting muted conversations and phone calls. In front of the table, on two free standing noticeboards set at a slight angle, was a paper map of the 'war zone', and notices of the latest information required to plan missions and score targets. The maps were annotated with plastic overlays, so that missions and target runs could be planned visually and changes could be immediately visible. Several people were tasked with keeping this map, and the related notices, up-to-date with the latest information at all times. This map/notice board became the focal point for information transfer during the exercise. Small groups would form around the map, break apart and then re-form as people gathered around the maps sorting out the information required to plan the ATOs and the missions (Agostino et al 1999). This arrangement was extraordinarily successful, as the table and map became a focus for both formal learning and informal social learning about the missions and the war.

The Briefing Room was used in a number of different ways. It was the venue for a series of formal pre-mission briefs and post-mission debriefs. The debriefings proceeded much as they had for peacetime missions at Amberley, with tapes, photos and mudmaps showing engagements at different times, and a special emphasis on lessons learned. There was considerable emphasis on the learning opportunities provided by the exercise in Darwin, and lessons learned were both formal and informal points of discussion after every mission cycle. The Briefing Room was also an arena for semi-formal planning, and it provided a meeting place for people to discuss things informally (especially before and after briefs).

The work of 95Wing HQ involved aligning activity systems to perform an afternoon and evening mission every day. To drive this alignment, a tight timeline was used to establish a rhythm of work to which all players needed to conform in order for missions to be successfully conducted. The timeline defined a strict 48-hour mission cycle which dictated planning, briefing and flying times for both daily missions (Agostino et al 1999). The importance of adhering to the timeline was stressed by the Executive staff. The timeline dictated the rhythm of the work and ensured the quality and completeness of the ATO.

It became clear that personnel who had been on previous, similar exercises managed to fit into the routine and rhythm of the work far more quickly than those who had not had some previous experience with this type of military exercise. Some problems occurred early in the exercise when there was a mismatch in expectations between the Operations Room and another area which were tasked with keeping the Operations Room up-to-date. There was, initially, no shared understanding of the importance of the timeline as a driving force for the work. However, as all sections of 95Wing aligned themselves with the timeline, the missions began to run more smoothly, and the stress level in the Operations Room began to decrease.

DISCUSSION OF THE ETHNOGRAPHIC METHODOLOGY USED

Field trips were organised so that the research team could spend several days at a time observing the work taking place in different settings within SRG, using directed questioning to clarify any issues that were confusing or unclear. Great care was taken to remain as unobtrusive as possible during the field trips. Observations were written up in field notes, individually. These field notes were later circulated to all team members and discussed at team meetings.

The preferred method for conducting observations was to pair ethnographers in each setting. The ethnographic study began with a team of four researchers: three computer scientists and one social scientist. It ended with a team of four researchers: two computer scientists, one social scientist and one researcher from an information systems background. The field notes of different ethnographers revealed interesting contrasts in what each had observed. Some ethnographers were information focused, identifying what was articulated in conversations, what artefacts were used, and the contents of these artefacts. Other ethnographers focused on the interactions that occurred between people, the body language, the relationships, and how these relationships affected the discourse. The ideal pairing was between an ethnographer who was information-oriented and an ethnographer who was interaction-oriented. This also seemed to be a gendered process where, on the whole, the women on the team were more interaction-oriented and the men more information focused (Agostino et al 1999). Without attempting to make any conclusions, it is also interesting to note that the information-oriented ethnographers were from a computer science or engineering background, while the interaction-oriented ethnographers were from a social sciences or information systems background.

The research team would meet daily and discuss observations and any issues arising from the day's fieldwork. Team workshops were also held after each field trip to identify and consolidate the findings as the work unfolded and to identify key social learning issues across the field notes. Before each team workshop, each individual researcher's field notes would be distributed to all team members. These team discussions, or workshops, provided a forum for negotiating across the different intellectual cultures of the team. These negotiations bridged the different backgrounds of each team member, their different experiences in the setting, the different meanings people assigned to what they saw, and the different issues that they perceived to have arisen from the work. Individual team members viewed the work in different ways depending on their own experience, discipline, and theoretical base. The different perspectives of the team members enriched the data and the minutes of the team meetings became the objective record of the data analysis and the study findings (Agostino et al 1999).

Constraints and Limitations

There were a number of constraints placed on the ethnographic aspects of the Pilot Study. Over the period the study took place the composition of the team changed significantly with all but one team member leaving the team either permanently or for a period of time. Limited funding for travel and fieldwork also curbed opportunities to observe the settings in greater depth.

According to Harvey and Myers (1995), there are three major limitations to ethnographic research: the difficulty of generalising findings; the time factor; and, finally, the difficulty in presenting findings. Furthermore, the research team found a further limitation arose because much of what was being investigated was often invisible until processes failed, or an exception occurred.

The first limitation of ethnographic research identified by Harvey and Myers is that it leads to in-depth knowledge only of particular contexts and situations. While this is certainly true, Harvey and Myers also state that it is only true until a large body of knowledge of many situations is developed. This ESLA Research Study aims to collect a significant body of knowledge by going into a number of settings over a number of years. However, before conclusions are reached, in terms of generalised models, it may be necessary to employ supplementary methodologies to test the wider applicability of the findings.

The second major limitation of ethnography identified by Harvey and Myers is the time commitment required to gather data and carry out many levels of interpretive analysis. However, as Harvey and Myers themselves conclude, despite the difficult and time-consuming nature of ethnographic research, it is a very 'productive' research method considering the amount and substance of the research findings. This is also the conclusion reached by the ethnographers involved in the Pilot Study. It is difficult to conceive of any other research methodology that would have resulted in the same multi-layered, rich pictures derived in the Pilot. In the exploratory stages of this sort of new research, the time commitment appears to be well worth the results received.

Harvey and Myers third, and final limitation is identified as dealing with the publication of results. With ethnographic research, they explain, the approach and the resultant nature of the knowledge is holistic, making the knowledge generated recursive rather than cumulative. This distinction is often not appreciated by those who operate through more traditional approaches. This limitation is yet to be tested by the ESLA research team.

Making the Invisible Visible

An interesting limitation of the methodology identified by the research team was the fact that, for routine work, social learning was sometimes invisible. This essentially left the team with two options. Either wait for exceptional conditions where the routine fails, exposing some of the invisible structures, or identify anomalies in the observations and follow up with direct questioning. Both of these approaches proved successful although it was more reliable to use direct questioning followed by further ethnographic observations to facilitate understanding and to reveal the otherwise 'invisible' structures.

The ethnographic approach to investigation is said to be most appropriate where research is of an exploratory nature, the context is of particular importance and there is a need to understand social processes - all of which applied to the Pilot Study research. Inevitably, there was an epistemological learning curve for the research team, which involved the team's own social learning. Despite the limitations, the research team found ethnography a suitable and successful methodology for the purpose of this study.

FINDINGS ON LEARNING ORGANISATION DISCIPLINES

Senge (1992) suggests that five disciplines will enable a learning organisation: personal mastery, mental models (or assumptions), shared vision, team learning, and systems thinking.

Personal Mastery

Senge acknowledges that while *individual* learning does not guarantee *organisational* learning, without it, organisational learning cannot occur. Responsibility for learning must be accepted by each individual if the organisation is to create a learning organisation environment (Hoffman & Withers 1995). Ideally, organisations should provide multiple avenues for individual and collaborative learning.

The importance of individual learning is well understood in the SRG environment, as the consequences of not doing a job properly can mean the difference between life and death. It appears that, in general, every member of the community knows they have a role to play and they understand the vital significance of their role, whether that role involves flying or maintaining an F-111, providing intelligence for a flying mission, planning a flying mission, or being responsible for the pastoral care of the aircrew who will fly a mission.

However, Senge's discipline of personal mastery includes more than a commitment to individual learning or expertise. Personal mastery also involves an individual in "continually clarifying what is important" to them, and "continually learning how to see current reality more clearly" (Senge 1992:141). This, according to Senge, means having an unconditional commitment to the truth; a realistic understanding of the gap between current reality and personal vision; and a clear understanding of the inter-relationships and interdependencies of the systems within which an individual operates.

Given this additional dimension, personal mastery is a discipline the research team observed within the executive world and the aircrew world of SRG, particularly during the military exercise. To the extent that it is possible to generalise from the observations made, it appears that both the executive staff and the aircrew were very much committed to continual clarification of what was important and the need to see current reality more clearly. They were also very much aware of the interdependencies of the systems within which the exercise was being conducted. However, personal mastery was also observed in the breach. During the early stages of the military exercise, there was an obvious disconnection between one of the sections supplying information and the section planning missions. Individuals within the information-supplying area did not, initially, have a clear understanding of the inter-relationships and interdependencies within the 95Wing HQ, nor a clear understanding of the gap between their current reality and personal vision. However, given the fact that this problem was quickly recognised and rectified, it is possible to say that, during the Pilot Study, the Wing HQ was observed to display a significant degree of a personal mastery discipline.

Managing Mental Models

Mental models are the entrenched assumptions or "deeply internal images of how the world works, images that limit us to familiar ways of thinking and acting" (Senge 1992:174). Mental models can be simple generalisations like 'people are basically dishonest' or quite complex theories about how a business process works. These models, or assumptions, dictate and often constrain actions and interactions. To overcome this potential limitation, it is necessary to manage these models; to confront, test, reflect on, and improve internal assumptions of how the world works. Weintraub (1995) believes that changing mental models can be the most difficult kind of learning but mental models will change, as people come to understand and experience success with the behaviour that arises from new models and as this behaviour become more habitual and tacit.

Because of the tacit nature of mental models and the limited duration of the Pilot Study, it was not possible for the research team to make definitive observations about individual or organisational mental models, or how they may have been managed or changed over time. This will be overcome with the use of supplementary methodologies in future research. However, the research team observed some tenets of the deeply entrenched organisational culture at SRG, and some of the ways in which this culture was sustained and perpetuated. It seems likely that an organisation that invests so much in nurturing its culture, must, by definition, be managing mental models. This culture is discussed in the next section.

Building a Shared Vision

A shared vision is a vision that most people in an organisation are truly committed to because it reflects their own personal vision and it creates a sense of commonality and shared purpose. However, a shared vision is about more than purpose or objectives. A shared vision creates a common identity, purpose, understanding, image, and a set of governing values for an organisation (Senge 1992). Building a shared vision can be seen as an ongoing process, actively practised by organisational leaders; incorporating the changing personal visions emanating from all levels of the organisation. Governing values are an important part of this shared vision as they form the basis of the culture of an organisation: "A strong, consistent culture grown from shared values provides all of the control necessary for directed learning" (Hoffman & Withers 1995:474). The key to an organisation's cultural strength is consistency, and the key to consistency is having everyone sharing in the understanding, sustenance and responsibility for that culture.

Any military organisation is steeped in a deep, historical tradition that forms the basis of its culture. This is certainly the case of the RAAF personnel at SRG. Furthermore, in an organisation like the Wing HQ the sense of

shared purpose and objective is very much heightened, as the ultimate price can be paid for divergence from that vision. The safety of the aircrew flying strike missions is a paramount and pervasive imperative and every person in the organisation seems to understand they have a role to play in ensuring that safety. This shared responsibility also leads inevitably to an environment necessarily built on trust. This was also observable at the early stages of the military exercise, where 95Wing brought together many different aircraft and aircrew that had not flown together before. The trust within the members of the Amberley-based Wing HQ had to be extended to the other pilots and navigators involved in the missions and this acceptance seemed to be negotiated and nurtured through the familiarity of the mission briefings, and informal discussions around the Operations Room table. During the first week of the military exercise, when a United States Air Force FA-18 pilot (on a different, unrelated military exercise) crashed in the exercise target zone, the 95Wing missions for that day had to be speedily re-planned. This need to divert from the normal, planning timeline resulted in an uneasiness among Mission Commanders and aircrew that, one can speculate, could only have been exacerbated by this tragic reminder of the possible consequences of error.

The governing values of trust, the minimisation of fear, and forgiveness, are all factors that foster innovation and provide a fertile environment for learning; freeing people to speak honestly, share information and offer suggestions without fear of ridicule or retribution (Handy 1995, Hoffman & Withers 1995). "For a learning organisation to take root and grow, it must stop holding people accountable for mistake-free performance, and begin holding them accountable for learning from their mistakes" (Hoffman & Withers 1995:470). The learning organisation approach accepts not only the making of mistakes, but also encourages the sharing of them for the benefit of the whole organisation.

This focus on lessons learned, rather than mistakes made, is very much part of the culture of SRG where protocols for meetings and briefings are applied specifically to avoid confrontation and fault-finding. This was also the overriding theme at the military exercise. In Darwin, the executive staff was constantly emphasising that the exercise was an opportunity for learning. This was re-enforced at the mission debriefings where any 'mistakes' or 'misjudgments' made during missions were discussed openly as a problem to be discussed and solved, and no attempt was made to assign blame. The predominant atmosphere in these debriefings was inquiring and supportive and, therefore, conducive to learning. This emphasis on the learning outcomes of the military exercise was also evident in the post-exercise debriefing given to the research team on their last visit to SRG. The Executive Officer informed us he was planning to burn a CD-ROM of the ATOs developed, the tools used and the lessons learned at the 1998 exercise, to add to a database of previous military exercises.

According to Hoffman and Withers (1995), every lasting culture is involved in the ongoing creation and evolution of cultural signals, or rituals, which are a means of group identification, communication, education and reassurance. They allow group members to feel comfortable within their culture and contribute to interpersonal understanding and inter-generational continuity. The research team saw many instances of the creation and nurturing of these cultural signals and rituals at SRG and at the military exercise. This included the usual RAAF rituals and also symbols specific to SRG: treasured drawings on staff room walls; special caps issued for military exercises, past and present; and the 'war' stories that emerged from previous military exercises. All of these symbols add to the strong group identification making SRG more a cohesive community, than a mere organisation. Clearly, the Wing HQ and SRG have been very successful in nurturing and sustaining a shared vision.

Team Learning

Sharing lessons learned from mistakes requires not only trust, but also a strong sense of teamwork, and a belief that individuals benefit when their colleagues continue to learn and develop (Hoffman & Withers 1995). Certainly, empowered, self-directed teams are considered a potent force in organisations today; acknowledged as an effective way of conducting business and advancing learning (Dilworth 1995). The SRG personnel operate as a team on a number of levels: from the Wing level; through the squadron level; down to the vital inter-dependence of the pilot and navigator at the cockpit level. Beyond this, each member of these teams has a role as a team member in other teams, through secondary duties and formations like 95Wing, thereby inculcating the skills and practices of team learning more broadly. Furthermore, cross-peer learning is practised extensively at SRG, both informally through mutual engagement and more formally through peer review and exchange programs with other national airforces. According to Dilworth, cross-peer learning is an inherent consequence of effective team learning and "cross-peer tutoring becomes a natural occurrence in a learning organisation" (Dilworth 1995:251)

The discipline of team learning, Senge contends, also involves mastering the skills of dialogue and discussion. Dialogue is grounded in reflection and inquiry, and involves the "free and creative exploration of complex and subtle issues"; while, in discussion, "different views are presented and defended and there is a search for the best view to support decisions that must be made" (Senge 1992:237). Dialogue, then, involves the suspending of team assumptions (building on the individual's ability to confront their own mental models); and being able to see each other as colleagues and equals. Although the research team observed instances of both dialogue and discussion during briefings and debriefings, there was not enough opportunity to observe different team interactions in enough detail to conclude that these techniques are so pervasive and entrenched as to be called a discipline within the Wing HQ being observed. However, it is possible to say that, during the Pilot Study, aspects of dialogue and discussion

were observed, as were the briefing protocols, courteous communication skills, strong relationships, shared vision and strong cultural identity that would facilitate the skills of effective team dialogue and discussion.

Systems Thinking

Systems thinking is often seen as an analytical tool for dealing with complexity, but systems thinking is also a powerful means for generating shared meaning and insight. Senge sees system thinking as the fifth discipline: "the conceptual cornerstone that underlies all of the five learning disciplines ... the cornerstone of how learning organisations think about their world" (Senge 1992:69). Systems thinking is both the incentive and the means for integrating all the disciplines of organisational learning: "all are concerned with a shift of mind from seeing parts to seeing wholes, from seeing people as helpless reactors to seeing them as active participants in shaping their reality, from reacting to the present to creating the future" (Senge 1992:69). Systems thinking involves seeing inter-relationships, and balancing and leveraging processes through managing systemic delays and feedback, rather than by focussing on linear cause and effect.

The research team observed, and heard about, many minor instance of systems thinking at SRG, in terms of personnel seeing the whole, rather than the parts, in problem solving and conducting missions. This is a discipline that seems to be particularly re-enforced by the culture of the organisation - a nurturing culture that values common identification and a shared vision that is very much about creating the future. Since the research team was not able to observe the second week of the military exercise, they were keen to find out how the disconnection between the information-providing area and the Operations Room had been resolved. Consequently, this became one of the topics raised during interviews at the last field trip to SRG. Presumably, the linear approach to solving the problem would have been merely to instruct the officer-in-charge of the non-performing area to fix the problem. In fact, the research team was interested to hear that the executive staff of 95Wing had taken a systems approach to solving the problem. The XO stated that, clearly, insufficient training and instruction had been given to the non-performing information-providing area in preparation for the exercise. Consequently, in the second week of the exercise, the staff from the area were given clear instructions about how, when and who would up-date the two sets of information required. Furthermore, a lot of effort was put into involving senior staff from the non-performing area more directly with the Mission Commander groups and in ensuring these officers reported back to the officer-in-charge of this area, who was himself more actively aligned with the ATO development.

Organisational Learning and Military Organisations

While there are occasional references to military organisations, most of the theories on organisational learning use business based organisations as examples or case studies. Military organisations differ from business based organisations in a number of ways that may affect their ability to be learning organisations. Some of these differences are: members of military organisations generally choose to become members rather than happen to become members; new members of the organisation are generally expected to make a long-term commitment to the organisation; members of military organisations take on a full-time commitment and a way of life, not just a job; members of military organisation are generally extensively trained by the organisations; military organisations have a historical tradition and culture that pre-dates all current members of the organisation; members of a military organisation are expected to conform in ways that other organisations do not (uniforms, discipline, hours of work); military organisations are hierarchical and have a tradition of autocratic leadership styles; the goals and long term directions of military organisations are usually dictated by government ministers, and not market forces or the personal vision of military personnel.

On face value, several of these differences may appear to work against the disciplines of a learning organisation, as espoused by some scholars. In particular, the notion that: "the barriers generated by hierarchy, and the autocratic leadership styles, create an atmosphere of distrust, fear, blocked communications, fragmentation of work effort, and stultification of organisational learning (Dilworth 1995:245). However, the observations made by the research team contradict this view. While SRG is certainly hierarchical, like any military organisation, and some leadership styles may seem somewhat autocratic, the over-riding perception is one of concerned, committed and strong leadership. This form of leadership seems to engender organisational learning, rather than stultify it.

Furthermore, the majority of differences listed above appear to positively facilitate the personal mastery, shared vision, team learning and systems thinking disciplines that are seen to be so important in enabling organisational learning. In fact, it may be true that the nature of military organisations, particularly at the tactical level, provides an environment much more conducive to organisational learning than the environment of most business organisations. Certainly, it is the opinion of the research team involved in the Pilot Study, that SRG and the Wing Headquarters studied are practising, to some degree, most of the five disciplines of a learning organisation.

CONCLUSION

The ESLA Pilot Study had two primary objectives: to see if it was feasible to observe, understand and document social learning processes, particularly in command and control situations; and to trial the use of ethnographic

techniques for this purpose. The Pilot Study clearly showed that it is feasible to research social learning processes in command and control situations, and a number of social learning mechanisms, contexts, and influences were identified. Furthermore, the Pilot Study also validated the use of ethnographic techniques for this purpose.

The numerous theories underpinning this research led to the identification of social learning constructs at various levels of abstraction, resulting in a set of complex, synergistic findings. Some of the processes and strategies that engender organisational learning in the Pilot Study setting were found to include: peer review and cross-peer learning; building a common identity; the judicious use of protocols at meetings and briefings; the encouragement of dialogue based on inquiry and reflection; and effective formal information flows. Similarly, some of the disciplines, or contexts, that were found to facilitate and nurture organisational learning were found to be based on: a strong common cultural identity with a shared purpose, objective and vision; the encouragement of individual expertise and mastery; the willingness to change the assumptions upon which the organisation is built; a clear understanding of the inter-relationships and interdependencies of the systems within which individuals in the organisation operate; an organisational focus on sharing lessons learned, rather than mistakes-made and fault-finding; and an emphasis on systems-thinking approaches to problem solving. Furthermore, the findings verify that organisational learning will flourish in an environment of trust, forgiveness and sharing.

The Pilot Study has been seen to be successful from the SRG perspective, DSTO's perspective, and the research team's perspective. The Study validated the utility of ethnography and the feasibility of observing, understanding and documenting social learning processes. As a result the research will continue in a new setting later this year. While it is too early to make conclusions about the final shape of a social learning architecture, some of the likely constructs are already becoming visible. Further research will add more understanding of appropriate architectures for systems that will support and facilitate social learning. Concurrently, it is envisaged that the ESLA task will lead to an enhanced understanding of the social structures that most successfully support people working, learning, and collaborating in command and control in the ADF.

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