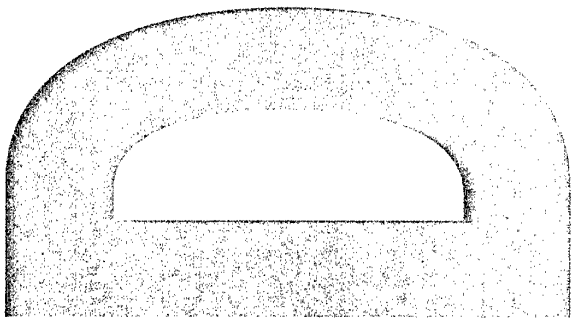
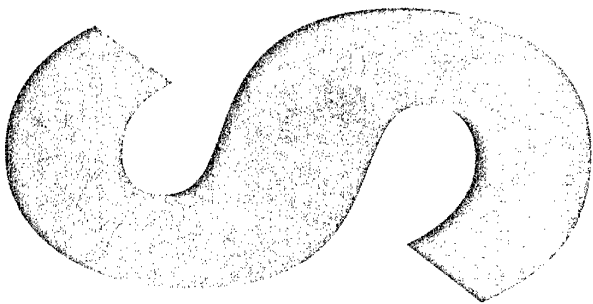
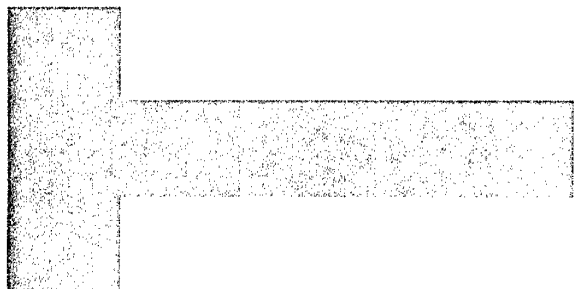
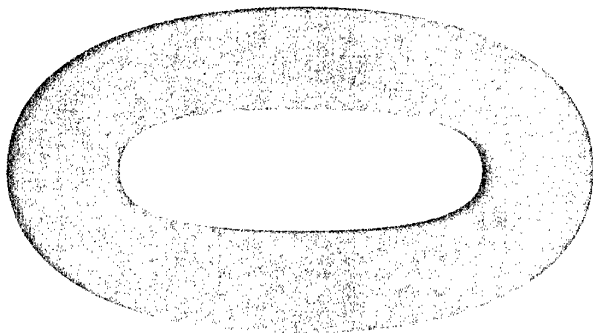




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Technology Organisation



**Social Learning and
Knowledge Management -
A Journey through the Australian
Defence Organisation: The Final
Report of the Enterprise Social
Learning Architectures Task**

Leoni Warne, Irena Ali and
Celina Pascoe

DSTO-RR-0257

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Technology Organisation**

Social Learning and Knowledge Management - A Journey through the Australian Defence Organisation: The Final Report of the Enterprise Social Learning Architectures Task

Leoni Warne, Irena Ali and Celina Pascoe

Defence Systems Analysis Division
Electronics and Surveillance Research Laboratory

DSTO-RR-0257

ABSTRACT

The research methods, research findings and outcomes of the Enterprise Social Learning Architectures (ESLA) task (JWF 98/004) are reported on in this document. Social learning is defined as learning occurring within or by a group, an organisation, or any cultural cluster and includes the procedures by which knowledge and practice are transmitted across posting cycles, across different work situations and across time. The term 'social' learning reflects that organisations, organisational units, and work groups are social clusters and that learning occurs in a social context. Knowledge management is tightly coupled to social learning.

Study results from three ADO settings are discussed: 82Wing Headquarters at the Strike Reconnaissance Group (SRG) at Amberley Air Base in Queensland; the then C4ISREW Division at ADHQ; and finally, Navy Headquarters (NHQ) in Canberra.

Organisational and cultural factors that positively contribute to social learning and to the retention of corporate knowledge within the organisations studied are identified with a focus on the elements of workplace culture that foster human interactions conducive to generative learning. The research findings discussed lead to the development of social learning architectures. Architectural depictions of social learning and knowledge management are presented as a representation of factors impacting on social learning and also in terms of a Toolset of actions, processes and strategies.

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The prime methodology used was ethnographic (observational fieldwork). Extensive semi-structured interviews were also undertaken with a sample of staff, and a quantitative survey questionnaire was used to support and validate qualitative data, and to facilitate comparison across the three settings.

The findings indicate that social learning is facilitated by a three-tiered collection of elements:

Overarching organisational values; Learning capability - environmental characteristics, both internal and external to the organisation; and Enablers - processes and strategies that, if present and effectively applied, can facilitate social learning. These are conceptualised as a Learning Toolset that an organisation can use to facilitate its activities in pursuit of required organisational outcomes.

Over 40 of these enabling processes and strategies are identified, and assigned to three categories: Force Structure - including issues like staff recruitment, retention, conditions of service and general morale issues; Preparedness - which, in terms of social learning and Knowledge Management, requires the two social learning constructs of Team Building, and Professional Development; and Capability - including information and knowledge management processes for helping retain the knowledge of valued and skilled personnel, facilitating social learning, and extending the skills and experience set of current personnel.

The report gives a sample of recommendations made to the commanders of the settings studied, and outlines the research teams 'lessons learnt' as derived from a Task Learning History exercise.

Published by

*DSTO Information Sciences Laboratories
PO Box 1500
Edinburgh South Australia 5111 Australia*

Telephone: (08) 8259 5555

Fax: (08) 8259 6567

*© Commonwealth of Australia 2003
AR-012-854
August 2003*

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Social Learning and Knowledge Management - A Journey through the Australian Defence Organisation: The Final Report of the Enterprise Social Learning Architectures Task

Executive Summary

This is a report on the research methods, research findings and outcomes of the Enterprise Social Learning Architectures (ESLA) task (JNT (later JWF) 98/004). The Task was a four-year research study that investigated 'social learning' at a number of different settings within the Australian Defence Organisation (ADO). The task was registered and piloted in 1998, approved in 1999 and terminated in mid 2002.

Social learning is defined as learning that occurs within or by a group, an organisation, or any cultural cluster and includes the procedures by which knowledge and practice are transmitted across posting cycles, across different work situations and across time. The term 'social' learning reflects that organisations, organisational units, and work groups are social clusters and thus learning occurs in a social context.

Studies were conducted in three ADO settings: 82Wing Headquarters at the Strike Reconnaissance Group (SRG) at Amberley Air Base in Queensland; the then C4ISREW Division at ADHQ which later became the Knowledge Staff (KS); and finally, Navy Headquarters (NHQ) in Canberra.

The aim of the task was to gain an understanding of effective social learning processes and strategies (enablers) occurring within the settings studied, to identify organisational and cultural factors that positively contribute to social learning and thus to the sharing and retention of corporate knowledge within organisations. More specifically, the research focused on elements of workplace culture that foster the type of human interaction from which generative learning can result. In this respect, knowledge management is tightly coupled to social learning and the task concurrently explored and explicated effective knowledge management processes.

The long-term objective of the task was to develop social learning architectures that provide a means for depicting existing systems, a blueprint for the development of future systems, and a roadmap of how to get from one to the other. This document reports on the developmental stages of these architectures and their value to organisations as tools for assessing and enhancing 'learning' status. Architectural representations include an abstraction model that depicts social learning and knowledge management enablers in terms of a 'Toolset' of actions, processes and strategies, and a Definitional Architecture in which each of the processes and strategies can be expressed in terms of the organisational values (or culture) that supports the

tools; and the organisation's communication environment which is the context for the tool.

Since the investigation necessitated a sound understanding of organisational culture, human social interactions, communication and relationships, the initial research methodology was appropriately based on ethnographic observations. However, the methodology evolved over time and as the researchers moved from one setting to another. While the primary methodology in all phases of the study continued to be ethnographic, the ESLA team also undertook extensive semi-structured interviews with a sample of staff in the two strategic settings, and quantitative questionnaires were used to support and validate the qualitative data, as well as to facilitate comparison across the settings. The combination of qualitative and quantitative research methods provided data and findings that are much richer than those derived from one of these methods alone. NVivo software, designed for analysis, storage and retrieval of qualitative data, was used by the ESLA team to manage the qualitative aspects of the research.

The findings reported here represent the collective research results from all three settings. Foremost, the findings indicate that social learning is facilitated by a set of overarching organisational values:

- Empowerment (where empowerment of staff also makes them accountable);
- Trust (which entails mutual respect);
- Forgiveness (in terms of allowing personnel to take reasonable risks, forgiving mistakes and facilitating knowledge construction on the basis of lessons learnt);
- Cultural cohesiveness (in terms of common identity, shared goals and a shared understanding);
- Commitment (which includes a mutual commitment and loyalty between the employee and the organisation)
- Openness of the decision making process; and
- A culture of information sharing.

Apart from the overriding set of values, the research team identified additional sets of factors that support and enable effective social learning. These factors fall into two categories. The first, Learning Capability, refers to characteristics in the environment and provides a context in which the second category operates. This second category is referred to as Enablers and represents processes and strategies that, if present and effectively applied in an enterprise, can facilitate effective social learning and knowledge management. The enabling processes and strategies can be collectively conceptualised as a learning Toolset of actions, processes and strategies that an organisation can use to help achieve required organisational outcomes. This toolset could impact on social learning and knowledge management in four distinct ways: as a motivator, enabler, challenger or as an inhibitor of social learning.

During the course of the task, over 40 of these enabling processes and strategies were identified. The researchers endeavoured to represent the results in a way that would be most comprehensive, comprehensible and beneficial to the clients. Therefore, the identified social learning enablers were assigned to three categories:

- **Force Structure** - which included issues like staff recruitment, retention, conditions of service and general morale issues.

Within the Force Structure category, the enablers were grouped under two social learning constructs: Culture, and Job Satisfaction and Morale, as these are essential components of the force structure in terms of recruitment, retention, motivation for and sustainability of social learning.

- **Preparedness** - clearly the readiness of forces to be committed to operations within a specified time is dependent on the availability and proficiency of personnel, equipment, facilities and consumables. In terms of social learning, the most important factors to assure the preparedness of personnel is effective team building and professional development.

Within the Preparedness category, the enablers have, therefore, been grouped under two social learning constructs: Team Building, and Professional Development, as both of these constructs were considered essential for a force appropriately prepared for operations in terms of social learning readiness and sustainability.

- **Capability** - which is generally considered to be an effective combination of force structure and preparedness, can be further enhanced by using information and knowledge management processes to help retain some of the knowledge of those valued and skilled personnel within the organisation, to facilitate social learning and to extend the skills and experience of current personnel.

Within the Capability category, there was a single, but pivotal, social learning construct - Information and Knowledge Support. This form of support is essential to facilitate the acquisition, construction, generation transfer, and sharing of information and knowledge among members of an organisation, and as such, is a vital ADO capability and a fundamental requirement for effective social learning.

The enabling strategies and processes are interdependent and interrelated. This report describes how these constructs were refined and redefined, as seemed most appropriate for each setting, as well as the enabling processes and strategies that fell within these categories.

Furthermore, the quantitative results of the three settings are compared and contrasted in this report. The comparisons have been grouped into four categories: issues pertaining to organisational identity, work practices, career development, and job satisfaction. The results indicate that the personnel at all settings appear to feel disenfranchised from Defence decision-making processes and the construction of corporate knowledge. Only about one third of staff in all three settings felt their input was sought or considered by the senior defence managers. Of all three settings, SRG tended to have the strongest sense of organisational identity and cultural cohesion.

With regards to work practices, while none of the settings felt adequately supported by the records management systems within their organisation, all settings felt well supported by other organisational protocols and in particular their fellow workers. The

degree to which they felt supported by their colleagues varied significantly among the settings. The single service headquarters, in general, rating much higher in these areas.

In terms of active career development, perceptions differed significantly from setting to setting, with SRG personnel's careers (with the exception of skills transferability) far more actively managed than in the other settings. The data gathered indicated that the majority of staff in all settings volunteered for their postings. However, perceptions of unpredictability, lack of transparency and inflexibility in the posting process, and the perceived paucity of adequate training in the strategic headquarters settings were evident.

The comparisons of factors relating to job satisfaction deal with issues such as control over work, the workload, team support of its members, career prospects and staff turnover. The results indicate that there was considerable variability among the settings in regard to their perceptions of sense of control, conflict management and understanding what is expected in the workplace. In all settings studied, team support played a vital role in staff job satisfaction.

Over the four year duration of the task, the ESLA research team made over one hundred verbal or written recommendations for improving social learning and knowledge management processes within the settings studied. This report includes a sample of generally applicable recommendations in Section 5, p27. A majority of these recommendations deal with so-called 'people issues' as these issues were dominant in all the settings studied. It is the firm belief of the ESLA research team that Knowledge Management technology will not effectively facilitate social learning or knowledge management in organisations until the cultural foundations are laid. This is consistent with the ADO's emphasis on 'Results thorough People'. Results - because at the end of the day this is what the management expects. People - because results can only come through people, and people are the key to superior performance.

This report also includes the results of a Learning History exercise undertaken by the research team to identify lessons learnt during the duration of the task. This is included in Section 7, p47 in the interests of sharing knowledge with other task managers and research teams.

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Contents

1	INTRODUCTION	5
2	TASK IMPERATIVES	6
2.1	Objectives of the Task	6
2.1.1	Architectures	6
2.2	Task Context	7
2.2.1	Knowledge Management.....	8
2.2.1.1	Knowledge Management in the ADO.....	8
2.3	Settings Studied	9
3	EVOLUTION OF THE METHODOLOGY	9
3.1	Qualitative.....	10
3.1.1	Ethnographic Observations	10
3.1.2	Semi-structured interviews	11
3.2	Quantitative	12
3.3	The Successful Blend	12
3.4	N'Vivo database	13
4	SOCIAL LEARNING FINDINGS AND OUTCOMES	14
4.1	82Wing Headquarters, Strike Reconnaissance Group (Single Service Tactical).....	15
4.1.1	Return Visit to SRG.....	16
4.2	C4ISREW Division / Knowledge Staff (Joint Service Strategic Headquarters)	16
4.2.1	C3ID Pilot Study Findings	17
4.2.1.1	Induction.....	17
4.2.1.2	Records management.....	17
4.2.1.3	Information transfer and exchange.....	17
4.2.1.4	Capability process.....	18
4.2.1.5	Work environment.....	18
4.2.2	C4ISREW Staff Study	18
4.2.2.1	Return Visit to Knowledge Staff.....	21
4.3	Navy Headquarters (Single Service Strategic Headquarters)	23
4.4	Comparison Of The Three Settings	25
4.4.1	Organisational Identity	25
4.4.2	Work Practices.....	27
4.4.3	Career Development.....	29
4.4.4	Job satisfaction.....	31
5	RECOMMENDATIONS FOR THE ADO.....	33
5.1	Getting Started.	38
6	EMERGENT SOCIAL LEARNING ARCHITECTURE DESCRIPTIONS.....	39
6.1	Organisational Values	40
6.2	Enablers of Social Learning	40
6.3	Environmental Factors Supporting Social Learning.....	44
6.4	Structured Architectural Representation	45

6.5	Knowledge Management and Social Learning Tools:	
	Definitional Models	47
6.5.1	Toolset Abstraction	47
6.5.2	Definitional Architecture	49
6.6	Other Outcomes from the ESLA Task	52
6.6.1	Future Implications	53
7	LESSONS LEARNED	53
7.1	Lessons about Task Management	54
7.2	Lessons about Methodologies and Methodological Tools	55
7.3	Lessons about Social Learning and Knowledge Management	57
8	CONCLUSION	57
9	ACKNOWLEDGMENTS	59
10	REFERENCES	60
	KPMG Knowledge Management Maturity Model	64
APPENDIX B		65
	Binary Agree/Disagree Results from Surveys at C31D, NHQ, SRG, & KS.	65
APPENDIX C		70
	External ESLA Publications	70

List of Figures

Figure 1	Benefits of Ethnography as a Data Collection Method	10
Figure 2	Factors impacting on social learning in organisations.	15
Figure 3	C4ISREW Social Learning Enablers 1999-2000	20
Figure 4	Knowledge Staff Social Learning Enablers 2002	22
Figure 5	Organisational Identity I – survey results	26
Figure 6	Organisational Identity II – survey results	27
Figure 7	Work Practices I – survey results	28
Figure 8	Work Practices II – survey results	29
Figure 9	Career Development I – survey results	30
Figure 10	Career Development II – survey results	31
Figure 11	Job Satisfaction I – survey results	32
Figure 12	Job Satisfaction II – survey results	33
Figure 13	Factors impacting on social learning in organisations	39
Figure 14	Factors impacting on social learning: Organisational Values	40
Figure 15	Factors impacting on social learning: Categories of Enablers	41
Figure 16	Factors impacting on social learning: Enablers	43
Figure 17	Factors impacting on social learning: Environmental Factors	44
Figure 18	Structured Social Learning Architecture	46
Figure 19	Toolset Abstraction Model of Social Learning and KM	48
Figure 20	Definitional Architecture for Social Learning and KM Tools	50

1 Introduction

The Enterprise Social Learning Architectures (ESLA) task (JNT (later JWF) 98/004) was a four-year research study that investigated 'social learning' at a number of different settings within the Australian Defence Organisation (ADO). The task was registered and piloted in 1998, approved in 1999 and terminated in 2002.

For the purpose of this task social learning has been defined as learning occurring within or by a group, an organisation, or any cultural cluster and includes:

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.

Social learning, therefore, represents important processes that contribute to individuals' abilities to understand information, create knowledge from that information, and share what they know. Social learning is therefore intrinsic to knowledge management.

Studies have been conducted in three different ADO settings. The study was piloted, in 1998, at 82Wing Headquarters (HQ) at the Strike Reconnaissance Group (SRG) at Amberley Air Base in Queensland, and in Darwin for the 1998 Pitch Black Exercise. The other two studies were conducted in strategic headquarters: the then C4ISREW Division at ADHQ, 1999-2000; and then Naval Headquarters (NHQ), 2000-2001. Return visits were made to SRG in 2001 and to, Knowledge Staff (formerly C4ISREW) in 2002, to ensure the task findings were valid over time. Although all of this study was conducted within the ADO, it is clear from reports of similar studies, that many of the findings are equally relevant to any large, multi-functioned organisation that is engaged in innovation or knowledge work.

The research findings have been used to design architectures, or frameworks, that the ADO, and other organisations, can use to facilitate effective social learning for their staff. These findings are of importance because the ADO, like other organisations, faces the problem that much of the organisation's memory and knowledge is 'walking out the door' in terms of the skills, experience and the corporate knowledge of its ex-employees. The competitive edge now lies in gaining the *knowledge edge*, and to do so requires an understanding of how new knowledge is generated within groups, and even more importantly, how it is shared between and managed amongst members of an organisation. This report provides an overview of the findings with specific reference to the role of knowledge generation, its mobilisation and management.

While there may be some debate about the ultimate definition of Knowledge Management (KM), the authors do not intend to add to this debate in this report. Instead, we contend that there are certain axioms about the importance of effective knowledge management in organisational settings. One such maxim is that effective knowledge management must include the means for facilitating and supporting how knowledge is acquired, constructed, transferred, and otherwise shared among members of an organisation, in a way that seeks to achieve the organisation's objectives. Furthermore, the results of this research show that what is required to facilitate knowledge sharing among team members is an organisational culture and communication strategy that facilitates effective dialogue and supports team building activities.

2 Task Imperatives

In this section, the task objectives are outlined, the theoretical context for the task is discussed, and the settings studied are described. Collectively, these represent the foundations of the task and its boundaries.

2.1 Objectives of the Task

After a successful pilot of the task's methods at SRG, the Task Sponsor requested that the team undertake research into identifying some of the more successful learning and knowledge transfer procedures practised in command and control areas at the strategic level; so that learning, adaptability and critical thinking could be better understood and organisational learning and business processes could be better facilitated. As more knowledge was acquired about the more successful social learning structures and commonalities, social learning architectures or frameworks were to be developed in the hope that these models could be used to guide the development of processes and strategies that would enhance learning and knowledge management.

In the short term, headquarters, or parts thereof, studied over the duration of the task would receive feedback about their existing social learning and knowledge transfer practices and the degree to which they operated as learning organisations.

2.1.1 Architectures

There are numerous definitions of enterprise architecture. To some researchers, 'architecture' is simply a high level description (or model) of the system to be built. To others, it is conceptual or logical as opposed to physical. To others still, 'architecture' is 'requirements' whereas to some, it is simply a set of 'principles' (Zachman, 1999).

According to the META Group (1999), enterprise architecture provides organisations with the methods, processes, discipline, and organisational structure to create, manage, organise, and use models for managing the impact of change. It therefore provides a collective knowledge about those systems. Chen, El-Sakka & Clothier (2000), on context analysis for architecture practice, proposes that the definition of architecture should derive from three critical roles of architecture: providing a picture of existing systems, a blueprint of future systems, and a roadmap of how to get from one to the other. These are the principles that the ESLA team endeavoured to follow in the development of its models and architectures.

The development of social learning and knowledge management architectures has numerous potential advantages. These models can be used to:

- ◆ Enhance understanding of social learning concepts and aspects
- ◆ Detect problems and inhibitors to social learning
- ◆ Avoid risks by providing a disciplined approach
- ◆ Clarify and prioritise requirements for effective social learning
- ◆ Provide guidance on how to implement social learning
- ◆ Facilitate the promotion of social learning concepts to all stakeholders
- ◆ Input into future planning
- ◆ Contribute to operational cost effectiveness.

2.2 Task Context

The management and organisational learning literature of the 1990s reflects profound and continuous changes in the business climate, largely due to political and economic uncertainty. In this world of uncertainty, organisations need to continually renew, reinvent and reinvigorate themselves in order to respond creatively to external forces. Organisational knowledge, and how it is effectively incorporated into the organisation's practice, is a critical issue for the ADO. Many organisations invest heavily in implementing information technology in the hope of providing a seamless solution to managing information resources and organisational knowledge. Unfortunately, these initiatives are often implemented without much regard to how people in organisations go about creating and acquiring, sharing, and making use of information (Bednar, 2000; Davenport, 1994; Vandeville, 2000). The result is often under-utilisation and sub-optimisation of the technology, which is of particular importance within the ADO. The ADF Brief on the developing of the Knowledge Edge (2000) states that the "knowledge edge exists when, as a result of leveraging and exploiting information, communication and other technologies, and by the application of human cognition, reasoning and innovation, there is a comparative advantage in those factors that influence decision making and its effective execution."

A United Kingdom Study, supported by the Economic and Social Research Council and the Department of Trade and Industry, drawing on experiences from 14,000 organisations, revealed that less than 25% of IT investments properly integrate business and technology objectives and that 80-90% did not meet their performance goals (OASIG Study, 1996; Clegg et al, 1997; Jackson, 1997). The Study conclusions indicated that the problems are rarely caused by the technology itself; rather they are caused by the lack of attention paid to how people use technology and to other organisational factors. This issue of successfully managing information systems development, and of considering aspects of organisational culture and human social interactions, has been debated and researched for many years spanning back to the early '80s (Mumford, 1984; Butterfield & Pendegraft, 1996; Davenport, Eccles & Prusak, 1992; DeLone & McLean, 1992).

Research on the cultural aspects of those organisations that foster new knowledge and generative learning suggests that employee trust and open communication play an integral role. Higher levels of trust between managers and employees are correlated with more open communication (Ruppel & Harrington, 2000). Schein (1993) and Phillips (1997) suggest that information sharing promotes common identity, mutual trust, and organisational learning, and is directly related to organisational cultures that foster generative learning. Schein (1993) also claims that opening up and sharing encourages integration between organisational subcultures and in turn, organisational adaptation to change.

The ESLA task extended this body of research by focussing on elements of workplace culture that foster the type of human interaction from which generative learning can result. A key assumption underlying the study was that whilst new communication technology will support information sharing, it will not create the trust and interpersonal context necessary to achieve a true knowledge network. Values cannot be shared electronically or via bits of paper. Organisations are not based on electronic networks, rather, relationships must be initially constructed through face-to-face interactions (Davenport, 1994). Thus knowledge sharing will depend on the quality of conversations, formal or informal, that people have (Davenport & Prusak, 1998).

An organisational culture that recognises the value of knowledge and its exchange is a crucial element in whether knowledge work is successfully carried out or not. Such a culture provides

the opportunity for personal contact so that tacit knowledge, which cannot effectively be captured in procedures or represented in documents and databases, can be transferred (Davenport & Prusack, 1998; Webber, 1993). In a culture that values knowledge, managers recognise not just that knowledge generation is important for business success but also that it can be nurtured.

Therefore, use of the term 'social' learning reflects that organisations, organisational units, and work groups are social clusters, as are study groups and task groups, and thus learning occurs in a social context. As Jordan (1993) explains, in work life, socially based learning is occurring all the time - interaction occurs between peers, genders, functional groups and ages, and across hierarchies and it happens in ways not normally recognised as learning. Lave & Wenger (1991) refer to the interactions between people and the environment as situated experience or situated learning. As people interact, they learn and, over time, they develop a shared practice and contribute to the intellectual assets of the organisation (Wenger, 1998).

2.2.1 *Knowledge Management*

While the precise definition of the term Knowledge Management is still debated, there are some generally accepted tenets. It is generally agreed that knowledge exists in the minds of individuals and is generated and shaped through interaction with others. In an organisational setting, knowledge management must, at the very least, be about how knowledge is acquired, constructed, transferred, and otherwise shared with other members of the organisation, in a way that seeks to achieve the organisation's objectives. Put another way, knowledge management seeks to harness the power of individuals by supporting them with information technologies and other tools, with the broad aim of enhancing the *learning capability* of individuals, groups, and in turn, organisations. Knowledge Management is, therefore, tightly coupled to social learning. Informal, activity-based learning is inherent to all human activities and workplaces are rife with human interaction opportunities. It is through these interactions and interrelationships that we build the social and intellectual capital of our organisations.

Another significant issue for organisations operating in today's information economy is their ability to utilise the volumes of information that are now readily available. A critical factor for organisations is the speed at which they are able to productively process such information to enable the organisation to react rapidly to changes in their operating environments. In this context, organisations need to produce and re-produce knowledge. The shift from information to knowledge is an acknowledgment of the significant role of the human actor in the process of transforming information into effective organisational outcomes.

2.2.1.1 *Knowledge Management in the ADO*

In the Australia Defence Organisation the military Executive often refers to the importance of maintaining the 'Knowledge Edge'. As with Knowledge Management, a shared understanding of the Knowledge Edge is difficult to formulate, even though the term is used frequently in Defence Executive publications. What can be said though, is that the concept of the Knowledge Edge has little to do with how ADO personnel perceive their day-to-day work, how they acquire knowledge and how they share it with others.

Over the four yearly duration of the ESLA research, the ADO has become increasingly aware of Knowledge Management issues and their relevance to organisational effectiveness. KM programs have been initiated in a variety of divisions and branches within the ADO, however, as yet, there has been no successful attempt to introduce organisation wide KM policies or initiatives. Nevertheless, it is the ESLA team's assessment that while in 1998, the ADO could have been described as being at the second, 'knowledge aware' stage of the KPMG Knowledge

Management Maturity Model (see Appendix A), in 2002, it could be assessed as moving from the third, 'knowledge enabled' stage of the model, towards the fourth, 'knowledge managed' stage.

2.3 Settings Studied

Studies were conducted in three ADO settings: 82Wing Headquarters at the Strike Reconnaissance Group (SRG) at Amberley Air Base in Queensland; the then C4ISREW Division at ADHQ (which later became Knowledge Staff); and finally, Navy Headquarters (NHQ) in Canberra.

The research was first piloted, in 1998, at 82Wing at SRG Amberley. Five field trips were made over a six month period: four to the Wing Headquarters Group at Amberley, and one to Darwin, where 82Wing was joined by members of other Wing headquarters, to form 95Wing HQ (an artificial organisation specifically formed to play 'the enemy' in the 1998 Pitch Black Exercise). This study had two purposes: firstly to ascertain if it was feasible to observe, understand and document social learning processes, particularly in command and control situations, and secondly to trial the use of ethnographic techniques for this purpose. The Pilot Study validated the utility of ethnography and the feasibility of observing, understanding and documenting social learning processes. The Pilot Study methodology and outcomes have been extensively reported elsewhere (see Agostino et al, 1999; O'Neill, 1998; Warne 2000a & 2000b). As a result, the sponsor approved a task to study social learning in strategic settings, and the research continued. In 2001, the ESLA team made return visits to 82Wing, in May and April, to conduct a follow up study and validate that the findings were consistent over a three-year period of time.

The second setting studies began, in June 1999, as a small pilot study of the C3ID Branch of the then Command, Control, Communication and Computers, Surveillance, Reconnaissance, and Electronic Warfare (C4ISREW) Division, part of the Capability Development Program at ADHQ. This study was extended after three months, by the newly appointed Chief Knowledge Officer (CKO), to a fuller research study of the whole of the C4ISREW Division. At the end of the C3ID study, in October 1999, a task report was produced for the client, DGC3ID, reporting on the methods used in that study, the findings based on fieldwork and a survey, and the recommendations arising from those findings (Warne et al, 1999).

The C4ISREW setting was of particular interest as its personnel (both civilian and military) were distributed across different geographical locations, different services, and different functional branches. Furthermore, their outcomes were influenced by the prevailing economic and political climate. This differed considerably from the SRG setting, where the environment was very structured and the work environment lacked the same degree of ambiguity evident in C4ISREW. This had not changed substantially when the ESLA team conducted a follow-up study, in 2002, to the re-named, Knowledge Staff.

In the third and final setting, a single service strategic area, Navy Headquarters, was studied. The research focused on whether social learning constructs differed from those in the joint service environment of C4ISREW and the tactical setting at SRG. The study began in October 2000 and concluded in December 2001.

3 Evolution of the Methodology

The methodologies used in this research evolved as the task progressed and the research moved from one study setting to another.

There has been an increasing emphasis in the past decade on investigating the social and organisational factors that may underpin successful information system development and usage (Butterfield and Pendegraft, 1996; Davenport and Prusak, 1992; DeLone and McLean, 1992). Investigation of these issues necessitates a sound understanding of organisational culture, human social interactions, communication and relationships, and reflects an increasing awareness of the importance of the social aspects of socio-technical systems that people work and operate in.

3.1 Qualitative

3.1.1 Ethnographic Observations

The methodology employed in all phases of the study was based on ethnography. Researchers are increasingly employing qualitative methods, specifically ethnography, to gain an understanding of social, organisational and information systems interactions (Myers, 1999). Ethnographers acquire data that provides a rich context because they do so by immersing themselves in the situation – this enables them to gradually see and understand the key concepts that influence the setting. The research team used ethnographic techniques in the form of fieldwork, which entailed observing the work-taking place in different settings, and using directed questioning to clarify issues. According to Harvey and Myers (1995), ethnography is ideal for providing information systems researchers with rich insights into the human, social and organisational aspects of information system development and implementation. It is appropriate where a key aspect of the research is to analyse, or at least take into consideration, various aspects of the context and the social process. Given the exploratory nature of the pilot studies, as well as the importance of context in understanding the social process of learning, ethnography was deemed the most suitable methodological tool. The advantages of ethnography for this particular study one depicted in the following diagram (Figure 1):

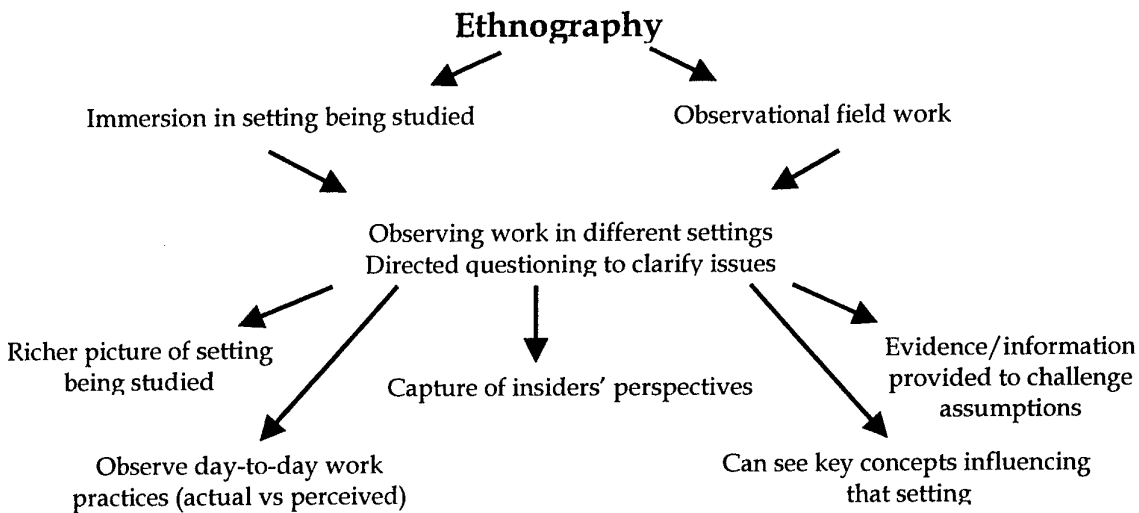


Figure 1 Benefits of Ethnography as a Data Collection Method

Prior to the commencement of the research study, the original team members were thoroughly briefed on the principles and ethics of ethnographic research by Gitte Jordan and Bill Clancy

(then from the Institute of Research and Learning associated with Xerox Parc) who helped to popularise the use of ethnography in industrial settings.

Like every research method, ethnography has some limitations. It is time consuming, both in terms of fieldwork, writing up of fieldnotes and in their analysis. It does not offer much breadth as only one organisation or one culture is studied at a time. The ESLA team addressed this issue by conducting research in a variety of settings. With ethnography there is a danger of influencing the subject's behaviour, and, furthermore, according to Atteslander cited in Fredrichs, (1975, p26) "We only believe what we see; unfortunately we only see what we want to believe".

In order to overcome this constraint, to better understand the setting under study and to gain insights into the social processes of learning, the ESLA team used orientation as an initial step in the strategic settings. During this stage, no data was gathered but researchers sat in on meetings, work areas, gathered documentation, and generally made themselves an occasional part of the work place. Only after it appeared that the researchers' presence was no longer regarded as an unusual distraction, did observations begin. The issues were further addressed by working in teams, whenever possible, of two researchers from different professional backgrounds and specialties. The multidisciplinary composition of the ESLA team shaped the type of ethnography that took place, as well as provided a richer picture of the setting under study.

For most of the study, the team consisted of four researchers: one social scientist, one interpersonal communication specialist, one information management/information seeking specialist, and one researcher from an information systems/organisational studies background. The multidisciplinary nature of the team meant that the data collection and analysis was enriched by the members' different perspectives, expertise and experiences, thus providing reliability for the findings. Team meetings were held regularly to corroborate and consolidate the findings as the work unfolded, and to identify emerging key social learning issues.

Due to the nature of the tactical environment, ethnography proved to be a very successful research and data gathering tool in that first setting. However, that setting was the only place where the ESLA team felt that ethnographic techniques alone were sufficient and timely enough.

3.1.2 Semi-structured interviews

In addition to ethnographic observations, the ESLA team undertook extensive, semi-structured interviews with a sample of staff in the two strategic settings. A stratified sampling technique was used to ensure that an adequate representation was achieved. The specific characteristics of interest were branch and directorate affiliation, gender, rank, whether military or civilian, work location, and duration of placement. In total, 15 interviews were conducted in the C4ISREW setting and 48 at the more populous NHQ.

The semi-structured interview proved to be a very useful tool for capturing perceptions about the work-place, and in some instances, was clearly cathartic for interviewees who felt that their opinions were not sought or valued in their immediate environment. While there was a consistent set of topics covered in each interview to guarantee uniformity of data across the whole sample, each interviewee was also given full rein to discuss what they perceived to be related topics, or other burning issues, so that new concerns emerged and the researchers were able to build on their understanding of the setting being studied. The following set of topics was covered by the semi-structured interviews: personal background and career history, familiarity with duty statements and job expectations, job handovers, match between personal knowledge / skills and knowledge / skills required for the position, on-the-job learning, information seeking

strategies, communication climate, networking, records management, corporate knowledge, work environment / physical location, gender issues, and other issues that emerged during the interviews.

The interviews were transcribed and coded according to a Thesaurus of terms developed by the ESLA team. These coded interviews and the coded field notes from observations were entered into the qualitative analysis database N'Vivo and were subsequently rigorously examined and cross-checked against the quantitative results.

3.2 Quantitative

The strategic settings under study were characterised by a highly politicised and unstructured climate and the areas relied on input both from internal parties and from outside agencies. Furthermore, the outcomes of work were dependent on the vagaries of the economic and political climates. In the first of these settings, C3ID, the ESLA researchers encountered a new problem. The personnel being observed sometimes interpreted occasional passing comments made by the ethnographer as statements reflecting the research findings. In one instance, one of the ethnographers commented to a Director that ethnographic work in his area had slowed because his subordinates were so busy they were rarely at their desks. The director's response was to send an e-mail to all his staff to say that "DSTO says you attend too many meetings". To counter such misinterpretations, a survey questionnaire was constructed and implemented. It served to move the participants' attention from 'what DSTO thinks' to 'what staff member's think' (Bailey, 1982; Harvey and Myers, 1995; Myers 1999). However, the survey also served as a validation of the observational data. The first survey administered to the staff of C3ID consisted of three parts - part A comprised forty-seven Likert scale questions, several of which acted as consistency check questions; part B comprised six 'open ended' questions, inviting respondents to give a brief statement on each of them. These questions were prompted by, and further explored, the data collected through ethnographic fieldwork. Finally, part C was designed to gather some demographic details about the respondents.

Similarly, the survey administered to NHQ staff consisted of three parts, however, the questionnaire (Part A) was more in depth and comprised 92 questions; in Part B respondents were asked to rank listed attributes (or add others if considered necessary); and Part C gathered demographic data. This same survey (with minor changes to organisational acronyms) was also applied at the follow up visits to SRG and the Knowledge Staff, giving a quantitative means of comparison of all three settings.

The response rate to the C3ID survey was 96.7%; for NHQ it was 73%; for SRG, a much smaller sample, the response rate was 92% and Knowledge Staff 73%. The survey became a part of the methodological toolbox used by the ESLA team and also served to facilitate the comparison of results across different settings, and across time in the same setting.

3.3 The Successful Blend

Researchers frequently combine different methods of data collection when studying the same social issue in a process known as triangulation. This concept has been discussed intensively in the area of social and information systems research and is a recognised way of validating research data (Silverman, 1985; Miles & Huberman, 1994). The ESLA research team was able to strengthen the key findings from the qualitative techniques by triangulating with quantitative data from the survey (Kidder, 1981; Bailey, 1982). Surveys can provide an accurate description of a real world situation from a variety of perspectives (Galliers, 1992) and the survey used by the ESLA team extended its understanding of the factors under investigation through the collective

perceptions of the personnel involved. This blend of both qualitative and quantitative methods of data collection was used in all settings studied after the first pilot study.

The combination of qualitative and quantitative research methods provides data and findings that are much richer than those derived from one of these methods alone. Qualitative methods are commonly used as a first step in quantitative studies (Tucker et al, 1995), and as the ESLA team used observational data to formulate quantitative surveys as well as it focused researchers' attention on pertinent issues that were further discussed in semi-structured interviews.

Furthermore, the combination of methods enabled complementary perspectives of each of the settings. The observations and interviews provided not only data that offered the insiders' point of view but also shed a light on the unique aspects of the various social settings that were studied (Pondy et al, 1983). On the other hand, the quantitative surveys enabled generalisations across the settings. It is this combination that has given the ESLA research strength and validity.

Not only was the research study triangulated by method (observations, interviews, and quantitative surveys), but additionally by data source (data had been collected at different times throughout the study and from varying settings). Triangulation was further facilitated by the multi-disciplinary composition of the research team.

The ESLA team took the opportunity to discuss the methodological approach to this study at numerous seminars and special interest group's meetings. Feedback from these was that the methodology was rigorous and the findings well triangulated and valid. The effectiveness of the methodology used by the ESLA team and the strength of its findings add weight to the view that the dichotomy of a qualitative-quantitative separation is now archaic (Miles & Huberman, 1994).

The combination of qualitative and quantitative techniques was facilitated by the use of a qualitative analysis software tool - N'Vivo.

3.4 N'Vivo database

N'Vivo is a database designed for analysis, storage and retrieval of qualitative data and includes a facility for reducing qualitative data to a quantitative matrix. The ESLA team used N'Vivo version 2.0 which allows users to edit, annotate, code and link data as well as import rich text format documents and link directly to multimedia, document files and websites external to the database. This facilitates the indexing and co-location of multiple sources of data producing a rich picture of the setting under study.

By using N'Vivo, the researchers had at their disposal a wide range of protocols for linking data and ideas, and combining processes as the data and the method required, allowing findings to emerge logically. The Document Browser facility is a rich text editor, a coder and a coding viewer. As concepts were developed, they were gathered in a flexible systems of nodes, and the Node Browser displayed the coded material as required. The coding in N'Vivo was done by dragging and dropping selected text to a previously devised node(s) or a node(s) to selected text. Coding could also be done automatically by Section Coding or using the Search Tool, however, this facility was not used by the researchers.

To analyse and explore relationships in the data the ESLA team used N'Vivo's integrated Show Tools. These integrated tools support qualitative searching and the program allows users to scope searches as specifically as required by filtering or combining search terms, nodes, attributes or text strings. Searches could be expanded or refined, asking the same question of a

different combination of data or a new question of the same material. The results of searches could be coded, so they could be built on to explore other questions if required. The ESLA research team underwent extensive training on the use of N'Vivo, but still feel they have not managed to exploit its full potential. The tool has proved to be an invaluable analysis utility.

4 Social Learning Findings and Outcomes

The findings reported here represent the collective research results of all three settings. The research findings are multilayered and have resulted in the identification of a set of overarching organisational values that facilitate effective social learning, and a number of environmental factors and enabling processes and strategies. In this section the collective results are discussed in terms of the enabling processes and strategies. In addition, the findings from all three settings are compared and contrasted.

The identified values are an enduring prerequisite for successful social learning and knowledge management, and these were consistent throughout the three settings. However, these values often existed only in pockets of the organisation and were not, necessarily, universally prevailing values across the ADO. In their absence, learning and knowledge sharing were deficient. These values are

- ◆ Empowerment (where empowerment of staff also makes them accountable);
- ◆ Trust (which entails mutual respect);
- ◆ Forgiveness (in terms of allowing personnel to take reasonable risks, forgiving mistakes and facilitating knowledge construction on the basis of lessons learnt);
- ◆ Cultural cohesiveness (in terms of common identity, shared goals and a shared understanding);
- ◆ Commitment (which includes a mutual commitment and loyalty between the employee and the organisation)
- ◆ Openness of the decision making process; and
- ◆ A culture of information sharing.

Apart from the overriding set of values, the research team identified an additional set of factors that supports and enables effective social learning. These factors fall into two categories. The first, Learning Capability, refers to characteristics in the environment and provides a context in which the second category operates. This second category is referred to as Enablers and represents processes and strategies that, if present and effectively applied in an enterprise, can facilitate social learning.

The characteristics of these Enablers, like the organisation's set of values, emanate from personal and cultural elements within it. The Enablers can, from time to time, be either challenged or inhibited by these elements; examples might include uncertainty of budget allocations, inconsequential work practices, a highly politicised environment, organisational change (change fatigue), and changing organisational cultural values. These relationships are depicted in Figure 2, below.

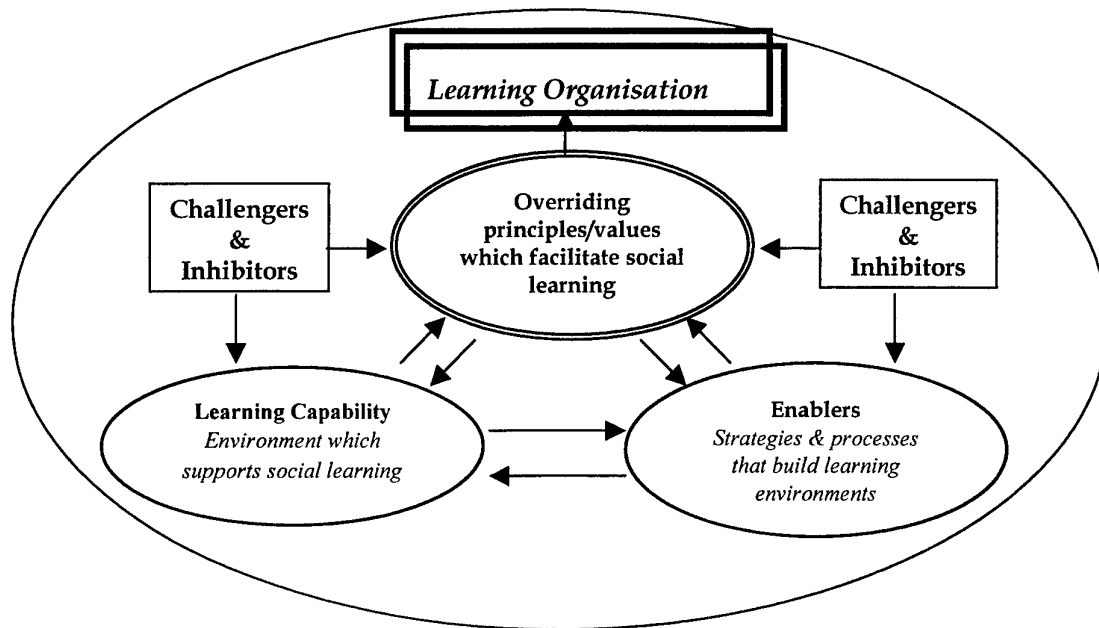


Figure 2 Factors impacting on social learning in organisations.

A comprehensive delineation of the social learning enablers, characteristics of the environment that supports social learning and the endurance of the overarching values is presented in the discussion of the Evolution of Social Learning and Knowledge Management Architecture models, in Section 4.5. The major findings of the research, as applied to the individual settings, is presented in the next section.

4.1 82Wing Headquarters, Strike Reconnaissance Group (Single Service Tactical)

The purpose of the pilot study in the tactical HQ was to trial ethnography as a research method for understanding social learning processes and to apply existing theories on organisational learning to this phenomenon. The findings are comprehensively reported elsewhere (see O'Neill, 1998; Agostino et al, 1999; Warne, 2000a & 2000b), but a summary of these findings is given here.

The ESLA team researched various theories on communities of practice, organisational learning and power in organisations and these theories have done much to inform this research and have been useful for interpreting the Pilot Study findings. These theories allowed the researchers to look at the social learning findings through various levels of abstraction, giving a multi-layered perspective of social learning mechanisms and contexts. At the lowest level of abstraction are the actual processes and strategies that propagate social learning; at the next level, the disciplines or contexts that facilitate and sustain social learning; and at the highest level, the pervasive influences of power, and, possibly, gender.

Some of the major social learning findings derived from the study include the importance of: sustaining communities of practice; instituting the broader organisational disciplines of personal mastery, managing mental models, sustaining a shared vision, team learning and systems thinking; and maintaining an environment where power is used positively.

Some of the processes and strategies that engender social learning include: apprenticeships and legitimate peripheral participation; mutual engagement; peer review and cross-peer learning; mentoring; strong goal alignment; building a common identity; management of development trajectories; the use of social networks and social organisation; the use of mediating artefacts and bridging agents; bricolage (the ability to make do with whatever is to hand by drawing on whatever organisational, physical or social resources are available); 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 facilitated and nurtured social learning at that setting 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 suggested that social learning would flourish in an environment in which the permeating influences of power, trust, forgiveness and sharing are positively applied to the construction of knowledge.

4.1.1 *Return Visit to SRG*

Two return visits were made to the Wing HQ in May and April of 2001. At the first of these visits a comprehensive survey was administered and observational fieldwork was conducted. The second of these visits occurred during the military exercise Tandem Thrust 01 and more fieldwork was carried out at this time. Based on observations and informal interviewing of staff, it was clear, on these visits, that the organisational values, environmental factors and enabling processes and strategies identified on the 1998 visits were still in place and effectively promoting social learning and knowledge management. In fact, these influences had become quite entrenched into the culture. Observations suggest that the Wing appeared to be united in a common goal, and a shared understanding about how best to achieve it. Observations confirmed that the meeting (briefing) protocols were much more routine and effortless. Participants readily admitted their mistakes, sometimes even seeming enthusiastic about doing so, but no finger pointing or blaming took place. The Wing has now even developed a mistakes database, and making entries into this database was seen to be a valued endeavour. As the result, the Wing appears to be a very effective environment for addressing problems and learning from mistakes.

4.2 C4ISREW Division / Knowledge Staff (Joint Service Strategic Headquarters)

The factors or constructs that effectively contribute to social learning processes emerged from the SRG pilot study, and the research undertaken at C4ISREW of the then ADHQ built on these findings. At the time of the ESLA study, the reorganisation of the Capability Divisions (later to be re-named Staffs) within ADHQ included considerable changes to the C3ID Branch and the division within which it operated. So research that was initially intended to be a pilot study in a strategic work area was terminated early, on the suggestion of the Task Sponsor and newly appointed CKO (Chief Knowledge Officer), so that the team could concentrate on a fuller study of the newly formed C4ISREW Staff within which the C3ID Branch became located.

4.2.1 *C3ID Pilot Study Findings*

The early termination of the pilot study had correspondingly curtailed the scope and depth of the findings. In investigating if the practice, processes and structures evident in the pilot setting were appropriate to knowledge work, the research team looked at Induction, Records Management, Information Transfer and Exchange, the Capability process, and the C3ID work environment. The outcomes were derived from field observations and a brief questionnaire administered to C3ID Staff. The response rate of this questionnaire was 97%. The findings were reported to DGC3ID in October 1999 and are comprehensively reported elsewhere (see Warne et al, 1999; Agostino et al, 2000; Ali et al, 2001 Ali et al, 2002), but a summary of these findings is given here.

4.2.1.1 *Induction*

Induction, or the perceived lack of it, was seen to be a problem in C3ID and within the larger ADHQ. In the C3ID Survey, only 33% of staff believed that they received an adequate briefing regarding their duties, and only 12% said that their induction was well managed. The remarks of many staff were consistent with these survey results. These C3ID staff perceptions suggested a strong need to develop a more formal induction and handover process for new staff in the Capability area. The need to improve the induction process was acknowledged by ADHQ staff and C3ID initiated its own investigation into the best means of addressing this.

4.2.1.2 *Records management*

The easy availability of corporate information has a direct input into knowledge acquisition. Information, therefore, is an important organisational resource, which, if properly managed, can lead to improved decision-making and increased productivity. The C3ID survey results indicated that only 55% of respondents agreed that they could easily obtain the necessary information required for day-to-day decision-making and 56% were familiar with record management processes at the Branch. These findings supported earlier observations made by the research team that records management and access to information contained in paper records posed a problem. Furthermore, there was a preference for accessing and transferring information electronically with 76% of respondents stating that electronic records within the Branch were more easily accessible than paper records. Clearly, the use of electronic tools for communication and decision-making was prevalent at all levels in C3ID.

4.2.1.3 *Information transfer and exchange*

Information transfer is generally considered to be a uni-directional process, while information exchange is a two-way or multi-directional process. The concept of information exchange is further delineated by some theorists (Senge, 1992) into discussion and dialogue, where 'dialogue' requires members of a team to suspend assumptions and enter into a genuine 'thinking together'. Genuine dialogue is not about promoting individual ideas in a winner-takes-all competition. Instead it is the free flowing of meaning through a group, allowing the group to discover insights not attainable individually.

Information exchange on a one-to-one basis and at section and peer level seemed mostly effective within C3ID. The majority of C3ID staff surveyed said that:

- ◆ they received adequate feedback on their work (76%);
- ◆ their ideas were well received (92 %);
- ◆ they could easily access their supervisors when needed (89%);
- ◆ they took part in the decision-making processes that affect their work (84%);

- ◆ they were able to voice their work-related opinions to their immediate supervisors (96%); and that
- ◆ their immediate supervisors were ready to listen to their concerns (93%).

These were all positive indicators of effective information exchange and working practice at this level, and yet, only 39% of C3ID staff surveyed believed that the exchange of information that took place in their work area was efficient. These perceptions may be due to poor availability of paper and electronic data, lack of information exchange into higher level decision processes, or the lack of opportunities for true 'dialogue' between all levels of staff within the organisation.

4.2.1.4 Capability process

Numerous problems with the Capability Process were identified during the pilot study. Staff interviewed indicated a perceived lack of transparency in the committee process, and the process itself was perceived as drawn out, repetitive and highly politicised. Managing the process was said to take far more time than progressing the work. The interviewees stressed that the outcomes often appeared arbitrary and there appeared to be little faith in the system.

The long time-line built into the work done in C3ID posed another problem because it led to a situation where there was no evident outcome for the work done. Sometimes, after years of work, a project was scrapped without ever coming to fruition. C3ID survey data indicated that this could lead to feelings of powerlessness and a loss of control, and could impact seriously on job satisfaction. For instance, 81% of respondents agreed that the long time-line of projects built into work done by C3ID often does not allow for evident outcomes, and 67% said that the long time-line of projects built into work done by C3ID contributed to low job satisfaction.

4.2.1.5 Work environment

The spatial layout of C3ID also raised some concerns among personnel. The open plan environment was not favoured by a number of respondents. For instance, 22% felt that the physical organisation of work stations promoted team work; 29% said they work effectively in an open plan environment; 86% of respondents indicated that their environment was too noisy; and 75% concluded that the current open plan work environment curtailed their ability to concentrate on a task at hand.

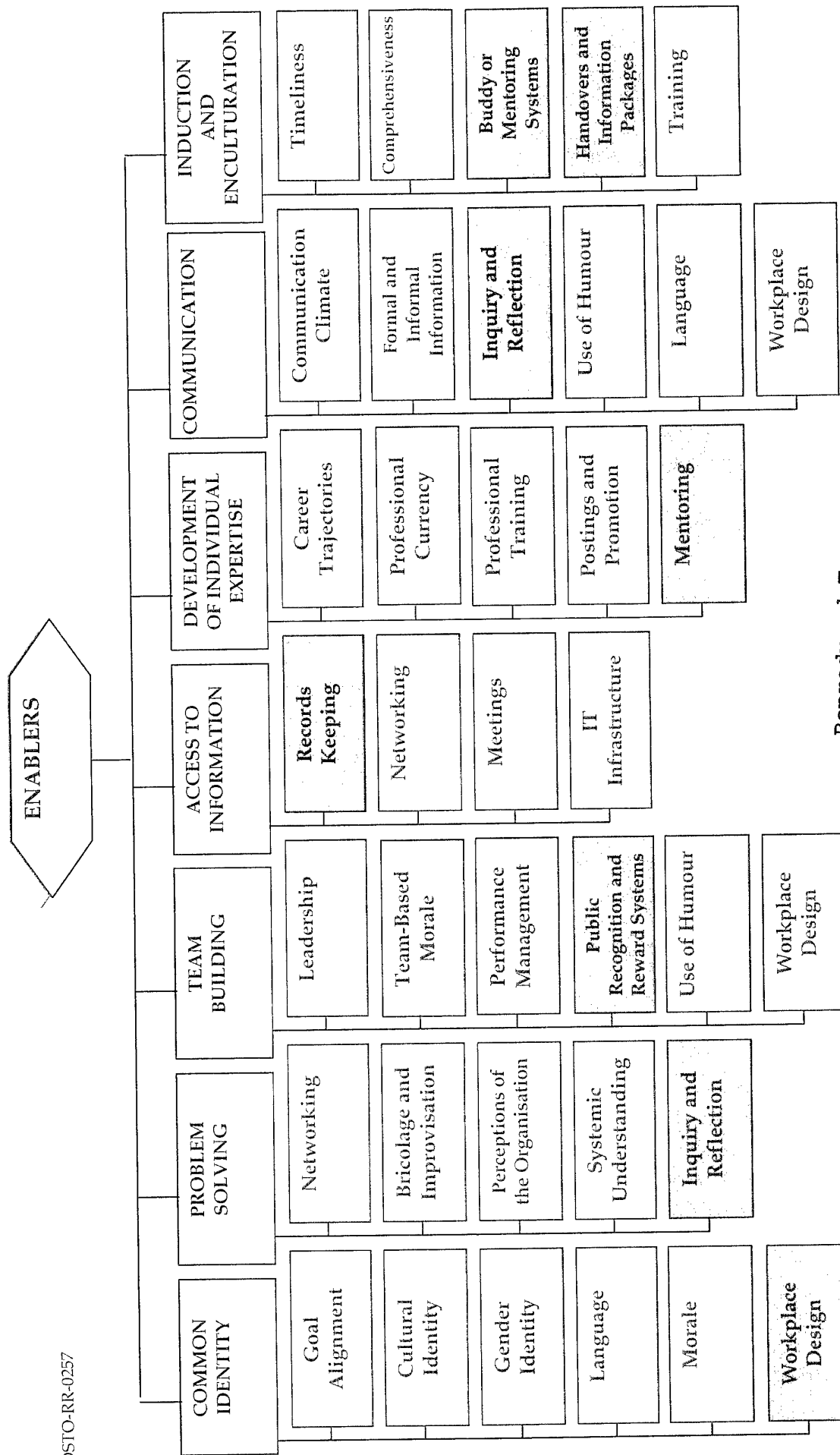
4.2.2 C4ISREW Staff Study

As stated earlier, the pilot study of C3ID was widened so the research team could embark on the fuller study of the whole of the C4ISREW Staff. The C4ISREW study was of particular interest for numerous reasons. Its personnel were distributed across different geographical locations, different services, and different functional branches, their outcomes were heavily reliant on the prevailing economic and political climate, and the working environment was subject to a high degree of ambiguity. Furthermore, the area had been subject to a number of reorganisations over the period of the study.

A major observation derived from the research studies was the importance of members having a shared vision, especially in terms of understanding organisational systems and objectives. It was also found that effective work groups saw themselves as interdependent on others outside their team, and when it came to problem solving, they regarded themselves as part of a larger, integrated entity, requiring effective system thinking to achieve objectives. This finding seemed to support views represented in the literature which argue that people working together on a joint enterprise for a sustained period form a community. As they interact, they learn, and, over time they develop a shared practice and contribute to the intellectual assets of the organisation.

Analysis of the data gathered allowed the research team to identify a set of factors that support and enable effective social learning to take place. These factors are referred to as enablers and represent processes and strategies that, if effectively practiced in an enterprise, can facilitate social learning. The ESLA research team identified 37 enablers or potential enablers that could support social learning within C4ISREW. Of these, nine enablers were already operating effectively, 20 enablers were only partially effective, or only effective in parts of C4ISREW, and eight potential enablers were identified as ineffective at that time.

These enablers are represented in Figure 3, overleaf. Those which are coloured green represent the social learning enablers that the research team believed were operating effectively throughout C4ISREW, those that were only partially effective appear in yellow, and those that were perceived to be ineffective, in red. The report made recommendations for improving the effectiveness of social learning enablers within C4ISREW, and gave a brief overview of the findings in terms of their relevance to the Strategic Themes for Defence Renewal (Warne et al, 2000). CKO recommended that the ESLA team also reported their findings to VCDF, and this was done in September 2000.



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Figure 3 C4ISREW Social Learning Enablers 1999-2000

At the conclusion of the C4ISREW study, the ESLA team began to develop social learning architectures, based on the pilot study and the C3ID/C4ISREW findings. The details of these architectures are discussed in section 4.5.

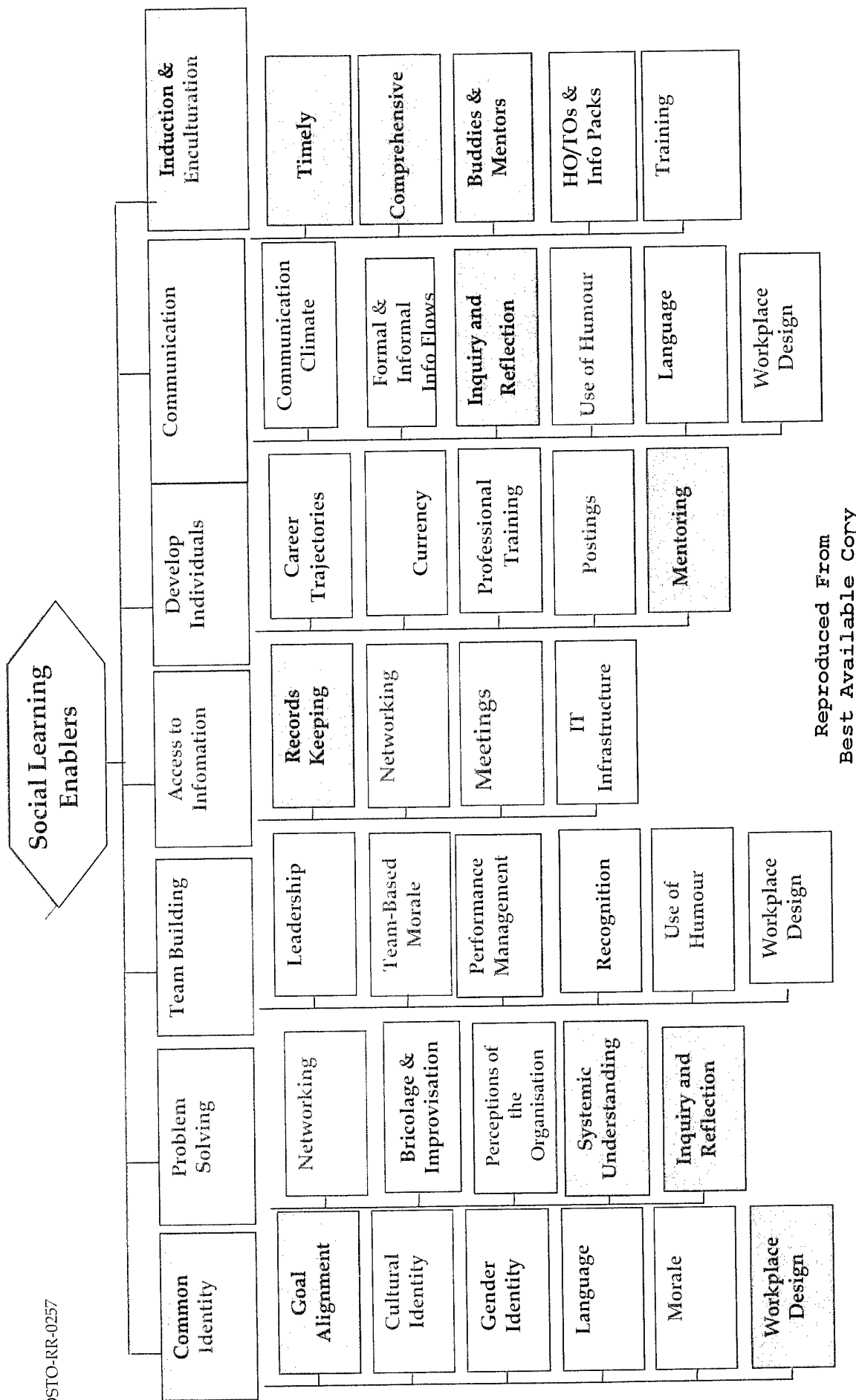
4.2.2.1 Return Visit to Knowledge Staff

Although the ESLA team was aware that some of the C4ISREW recommendations were implemented after the completion of the study, a return visit was scheduled and conducted in April of 2002 to note any changes and to ensure that the earlier findings on social learning enablers were valid over time.

On this occasion, a comprehensive survey was administered to the Knowledge Staff; but no observations were carried out. The results, therefore, were derived from the survey alone, and are, consequently, not as comprehensive as the original study of the then C4ISREW conducted in 1999-2000. However, there were also a considerable number of qualitative comments made on the survey and these were taken into consideration for the analysis. The original study included extensive observation, interviews, and the administration of a Team Management Index, as well as a shorter survey. The follow-up survey served to validate earlier findings and facilitated a comparative assessment of the current effectiveness of many of the social learning enablers identified in the earlier study. The response rate for the survey instrument was 73%.

The survey data gathered in 2002 revealed some improvements in perceptions of team building, access to information, and the development of individuals. This has resulted from improvements in team-based morale, in the provision and dissemination of information in meetings, and in perceptions about postings. However, mentoring, and records keeping continued to be problematic. Perceptions of problem solving remained mixed as in 1999; networks amongst staff continued to be strong, but perceptions of the organisation, and opportunities for inquiry and reflection had not improved since 1999. Opinions about communication within the organisation also continued to be mixed, with the use of humour being perceived as positive, but workplace design being perceived negatively. Common identity, induction and enculturation also continued to be seen negatively, as improvements that had been implemented in 2000 had lapsed. With respect to common identity there were negative perceptions of goal alignment and cultural identity. Induction and enculturation seemed to be seen as less timely and comprehensive than in 1999, and lack of buddies and mentors continued to be a problem. Overall, the data indicated that the staff views had not changed significantly over the two-three-year period and the recommendation given in the full C3ID and C4ISREW reports still applied. These findings were presented to HKS and senior staff in September, 2002, with a presentation being made to all Knowledge Staff a few days later (see also Warne et al 2002).

The findings from the 2002 Follow-up Survey were represented in a similar manner to the 2000 findings, although it was not always possible to make a valid determination for some of the enablers on the basis of the survey alone. Where the research team had not been able to make a judgment on the basis of the gathered data, the enablers have been left unshaded. This information is reproduced in Figure 4, overleaf.



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Figure 4 Knowledge Staff Social Learning Enablers 2002

4.3 Navy Headquarters (Single Service Strategic Headquarters)

The study at the Navy Headquarters focused on the extent to which the NHQ culture valued and supported information sharing, learning, and knowledge generation, and the extent to which social learning was enhanced or diminished by a predominantly single service strategic culture, as opposed to the joint services culture at C4ISREW. The study commenced in October 2000, and the results were presented in December 2001. The data gathered included fieldnotes based on observations, qualitative data from 48 comprehensive, semi-structured interviews with NHQ staff and both quantitative and qualitative data from an extensive questionnaire that was administered to 114 personnel. The response rate for this survey was 73%.

The ESLA research team concluded that trust, loyalty and camaraderie were, in fact, much stronger within the single service headquarters than in the joint environment. This fostered intense loyalty towards the organisation and highly effective team work, which, in turn, enhanced social learning at NHQ. This finding was corroborated by parallel research on trust and disclosure conducted by another member of the ESLA team.

This research investigated how ADF personnel made decisions about the disclosure of information, and specifically the psychological processes involved in such decision making. It was conducted across both single service and joint environments. Research results indicated that in both environments, a clear and robust 'service-loyalty effect' emerged. Put simply, personnel were significantly more likely to disclose 'entrusted' information for the interests of their own service, relative to the interests of other services.

Whilst the researchers expected to observe this service loyalty effect in single-service environments, it was somewhat surprising to find that it was also a strong feature of joint environments. Post hoc analyses showed that participant's sense of identification with their *own* service, rather than with the ideology of 'jointery' was the most significant predictor of their disclosure behaviour, across the range of entrustment scenarios that were explored.

While there were no observable changes in the organisational values that were identified as supporting social learning in the NHQ setting, the research team's understanding and nomenclature of some of the enabling processes and strategies were refined. The findings of the research, in this case, were presented in terms of the processes and strategies within NHQ that enabled social learning and how they impacted on issues relating to Force Structure, Preparedness and Capability of personnel in NHQ. While people are indeed essential components of the ADO's capability, this 'people' capability is dependent on effective force structure and the forces' level of preparedness. Similarly, effective social learning capability is also dependent on satisfactory force structure and in itself is a form of 'people' preparedness.

Therefore, the identified social learning enablers were assigned to three categories:

- ◆ **Force Structure** - which relates to the type of force required to achieve the operational level of capability necessary to conduct operations effectively. This included issues like staff recruitment, retention, conditions of service and general morale issues.

Within the Force Structure category, the enablers were grouped under two social learning constructs: Culture, and Job Satisfaction And Morale, as these are essential components of the force structure in terms of recruitment, retention, motivation for and sustainability of social learning;

- ◆ **Preparedness** - a measurement of how ready and how sustainable the whole, or part of, the ADO is to undertake military operations. The readiness of forces to be committed to operations within a specified time is dependent on the availability and proficiency of personnel, equipment, facilities and consumables. In terms of social learning, the most important factors to assure the preparedness of personnel is effective team building and professional development.

Within the Preparedness category, the enablers have, therefore, been grouped under two social learning constructs: Team Building, and Professional Development, as both of these constructs were considered essential for a force appropriately prepared for operations in terms of social learning readiness and sustainability.

- ◆ **Capability** - generally considered to be an effective combination of force structure and preparedness, and capability development is generally informed by relevant strategic guidance. That capability can be further enhanced by using information and knowledge management processes to help retain some of the knowledge of those valued and skilled personnel within the organisation and to facilitate social learning and extend the skills and experience set of current personnel.

Within the Capability category, there was a single, but pivotal, social learning construct – Information and Knowledge Support. This form of support is essential to facilitate the acquisition, construction, generation transfer, and sharing of information and knowledge among members of an organisation, and as such, is a vital ADO capability and a fundamental requirement for effective social learning.

The ESLA research team identified 30 enablers or potential enablers that supported social learning within NHQ, having redefined or collapsed some of the enablers identified in earlier studies (see Warne et al, 2001). The format used for presenting ESLA findings to NHQ was later to become the basis of the Structured Social Learning Architecture which contains the accumulated findings of the ESLA task (see Figure 18). More detailed discussion of the architectures arising from the NHQ findings appears in section 4.5.

Findings from the research showed that NHQ has been pro-active in moving to change the culture, recognising the impact of demographic and social changes and attempting to redress systemic problems. However, the organisation's loyalty to its staff, viewed through its conditions of service and other motivational factors was perceived, by many members of staff, to be eroding. This inevitably had a negative effect on social learning, which then, recursively, impacted on morale within the organisation. Capability issues related to Information and Knowledge Support were operating quite effectively within NHQ, but such a capability could be rendered meaningless where Force Structure problems are not addressed. Similarly, while some of the social learning issues relating to Preparedness were operating quite successfully in many parts of NHQ, particularly in relation to Team building, there were also perceptions of serious problems with the postings and promotion policies. As an outcome of this study, the ESLA research team made thirty recommendations to improve social learning in NHQ. The findings were reported to DCN and senior NHQ Staff in December 2001 and are comprehensively reported elsewhere (see Warne et al, 2001; Ali et al, 2002; Pascoe et al, 2002).

4.4 Comparison Of The Three Settings

To highlight the different perceptions of staff in the three different settings, the quantitative survey results have been grouped into four categories: issues pertaining to organisational identity, work practices, career development, and job satisfaction. Responses where statistically significant differences were noted among settings are presented in this section, as are a much smaller number of responses that indicate uniformity across settings. The results are derived from the 2000 NHQ survey, the 2001 SRG Survey and the 2002 KS survey. A table listing the binary (agree/disagree) results for all questions in all settings appears at Appendix B.

To highlight the different perceptions of staff in the three different settings, the quantitative survey results have been grouped into four categories: issues pertaining to organisational identity, work practices, career development, and job satisfaction. A selection of responses have been clustered under these headings highlighting where significant differences occur among the settings, as are a much smaller selection of responses that indicate uniformity across settings.

4.4.1 *Organisational Identity*

An organisational identity is one of the most important elements that facilitates social learning because it requires a shift from seeing ourselves as separate to seeing ourselves as connected to, and part of, an organisation or organisational sub-unit. The research team found that this shift in thinking is often associated with a strengthening of common identity.

The survey results indicate that in all the settings under study a vast majority of staff (80% and above) believed they had an input into decision-making affecting their work (see Figure 5). Barker & Camarata (1998) suggest that being involved in decision-making is one element of employee empowerment and an indicator that the organisation may be one that facilitates learning and the construction of new knowledge.

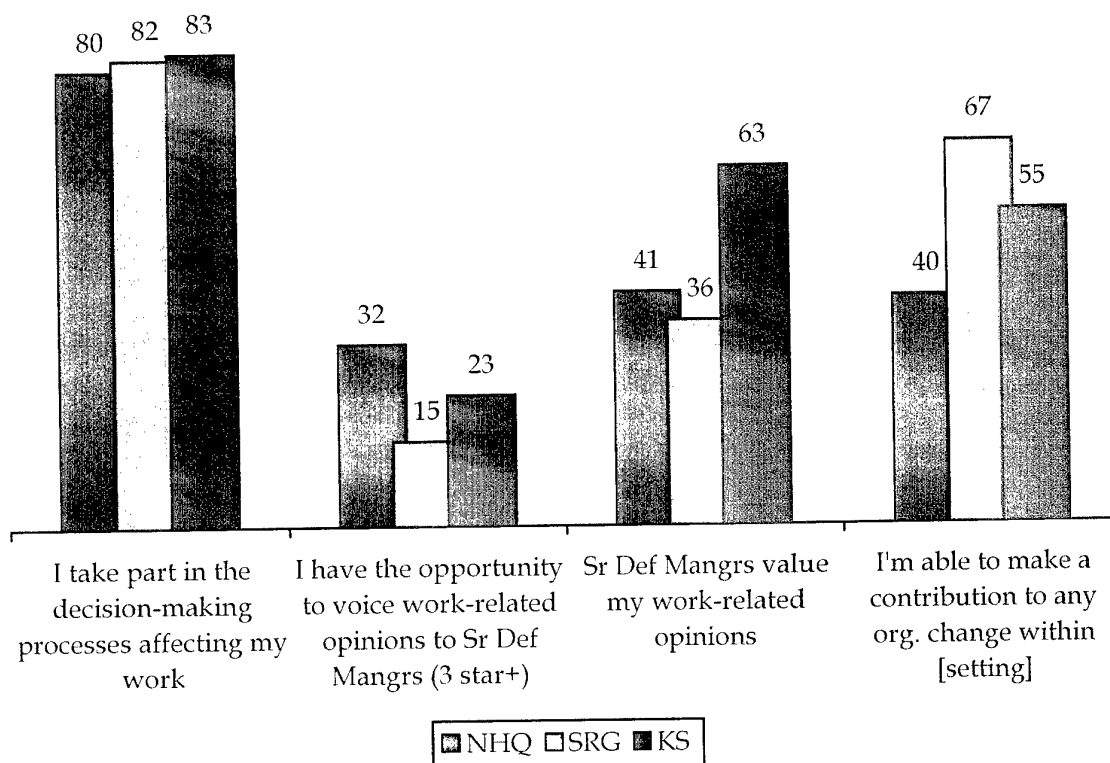


Figure 5 Organisational Identity I – survey results

However, the personnel at all settings appeared to feel disenfranchised from Defence decision-making processes and the construction of corporate knowledge. Only about one third of staff in all three settings studied felt their input was sought or considered by the senior defence managers. Once staff opinions were solicited by the senior defence managers, a much higher percentage, ranging from 36%-63%, felt that the managers valued these opinions. This led to the development of a culture of cooperation and partnership. Wenger (1998) claims that such a culture is characterised by the pursuit of common goals and arises from the process of shared learning and subsequent development of an enterprise's knowledge. The survey data indicates that a culture of cooperation and partnership did, indeed, exist but was not universal across all the settings. Certainly SRG, far from Canberra, both geographically and politically, felt the least involved in the Defence decision-making process, yet they were more engaged and empowered in organisational change within their own part of the organisation. Indeed, as can be seen in Figure 6 below, SRG, tended to have the strongest sense of organisational identity and cultural cohesion of all three settings.

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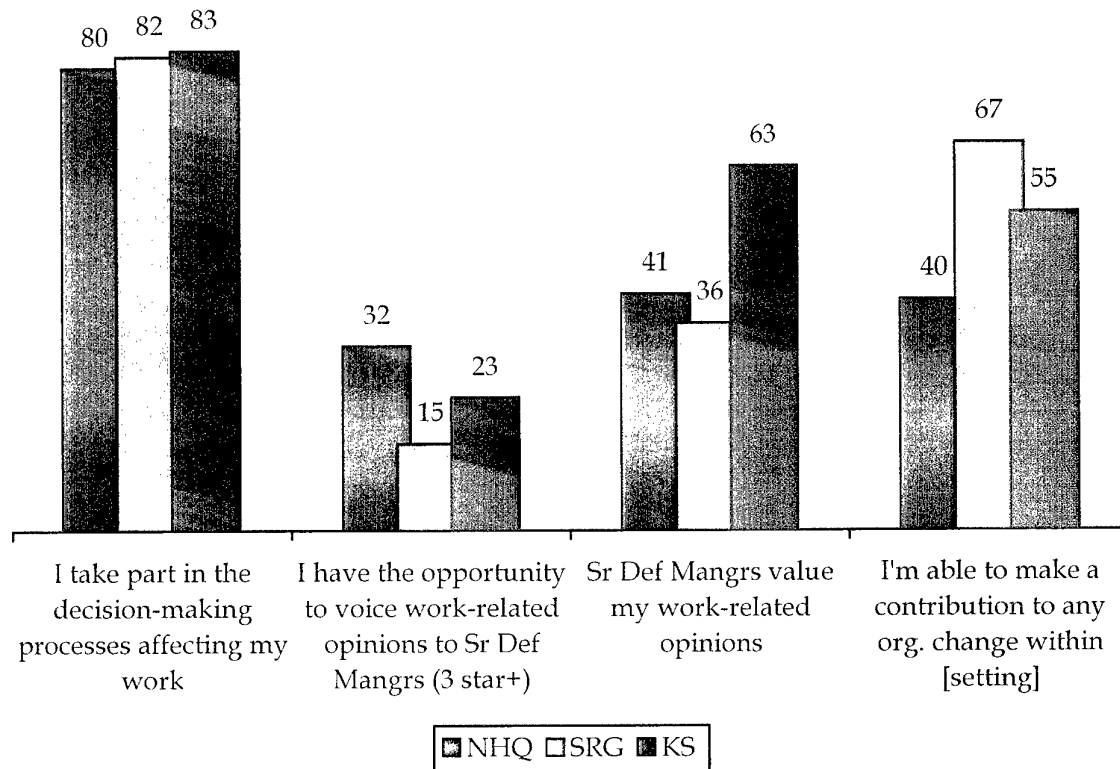


Figure 6 Organisational Identity II – survey results

4.4.2 Work Practices

Barker & Camarata (1998) propose that a work environment which facilitates learning and the construction of new knowledge requires, as a precondition, effective employee-organisation relationships. Such relationships would occur where behaviour is founded in the social aspects of the relationship where individuals support each other on the basis of concern for the other's welfare, in an environment where they all feel well supported by the organisation and its structures. It is evident from the results presented in Figure 7 below, that while none of the settings felt adequately supported by the records management systems within their organisation, all settings felt well supported by other organisational protocols and in particular their fellow workers. However, the degree to which they felt supported by their colleagues varied significantly among the settings. SRG in particular, but the single service headquarters in general, rating much higher in these areas.

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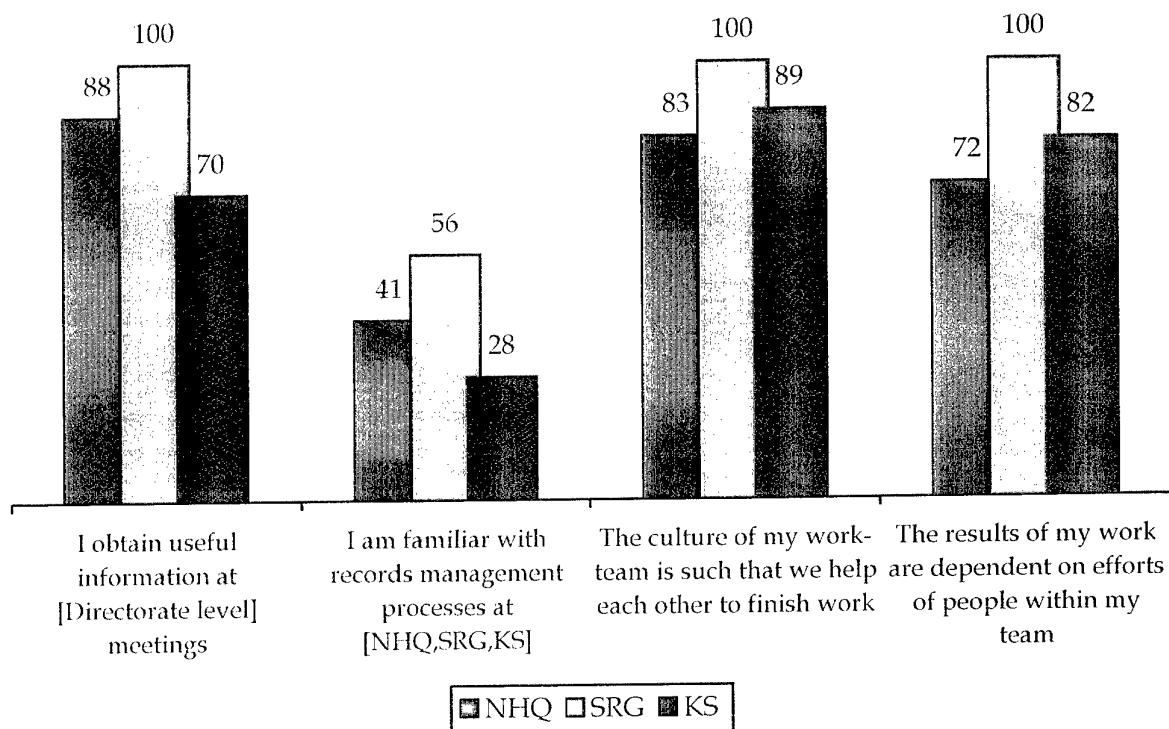


Figure 7 Work Practices I – survey results

The survey data collected (Figure 9, below) further indicates that a majority of staff perceived that they had organisational support with 60%-90% stating they receive adequate feedback on their work; the vast majority said that they were able to voice all work related opinions to their immediate supervisors. However, far fewer personnel in all settings felt that they had enough resources to perform their duties adequately, and that mentoring was a common practice in the organisation. These results give a mixed picture of work practices supporting social learning, with SRG again appearing to score highest.

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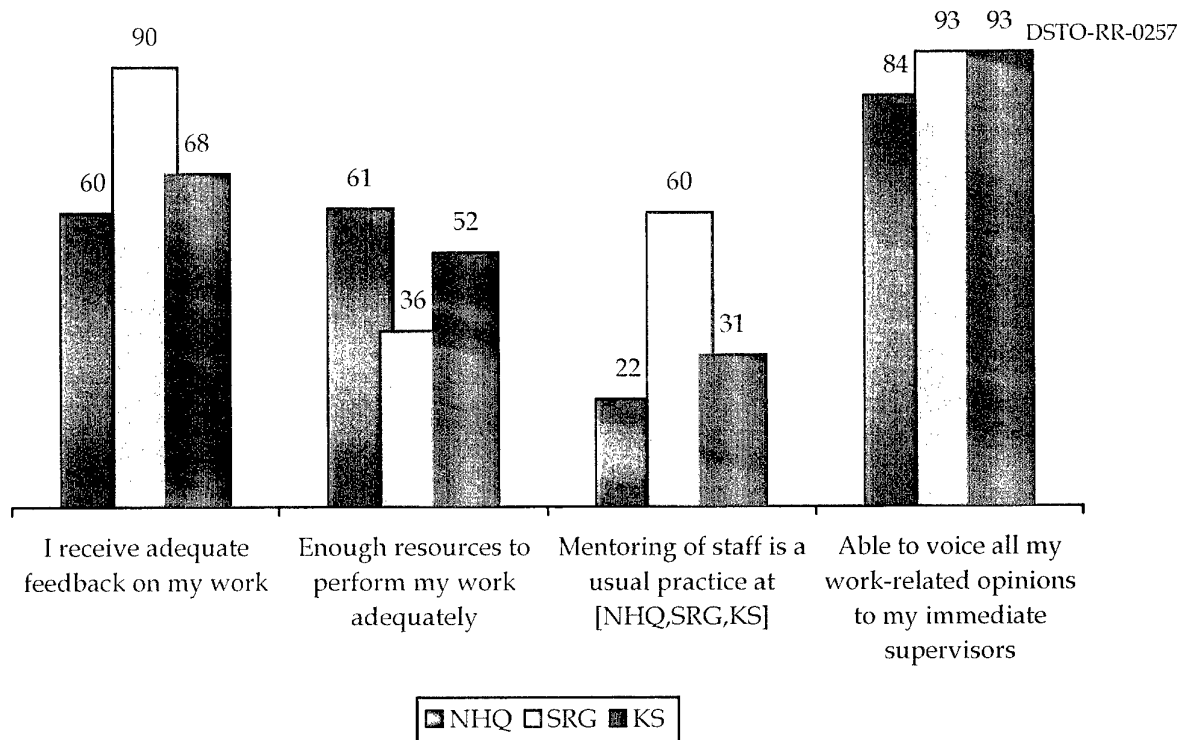


Figure 8 Work Practices II – survey results

4.4.3 Career Development

Appropriate professional training is a significant component of the development of individual expertise. Generally, the military excel at supporting their officers through graduate and postgraduate training. Training courses are also important to furthering individuals' expertise, as well as for forming the personal networks that subsequently develop. These networks are invaluable for accessing information and they play a vital role in knowledge sharing, construction and acquisition.

The importance of appropriate postings and promotions lies in the way that they support the development of the career trajectory of individual staff members. A number of staff told the research team that only the most highly rated staff had their postings actively managed. Also, many staff told the researchers that it had been made clear to them that they had no prospects of promotion for the remainder of their career. It is likely that such statements would have a serious impact on staff turnover and hence the retention of corporate expertise. In addition, the research team was told many times of the adverse impact that this information had on the morale of the individual affected. It is highly likely that many of these individuals would feel less motivated in their work; the likely consequence of which is that their interest in increasing their individual expertise will also decrease, except where it helps position them for a career in the civilian workforce.

From the data gathered through the surveys (see Figure 9 below), it was clear that the majority of staff in all settings volunteered for their postings. However, the research team became aware of perceptions of unpredictability, lack of transparency and inflexibility in the posting process, and the perceived paucity of adequate training in the strategic headquarters settings.

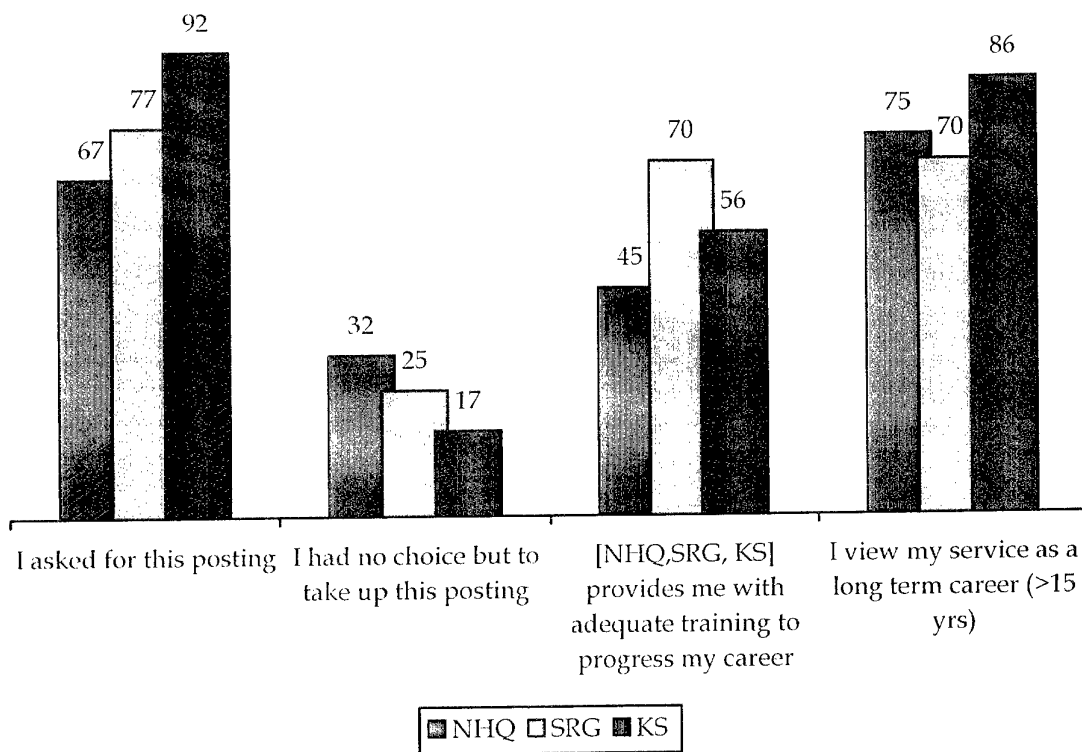


Figure 9 Career Development I - survey results

In terms of active career development, perceptions differ significantly from setting to setting, with SRG personnel's careers (with the exception of skills transferability) apparently far more actively managed than in the other settings (see Figure 10, below).

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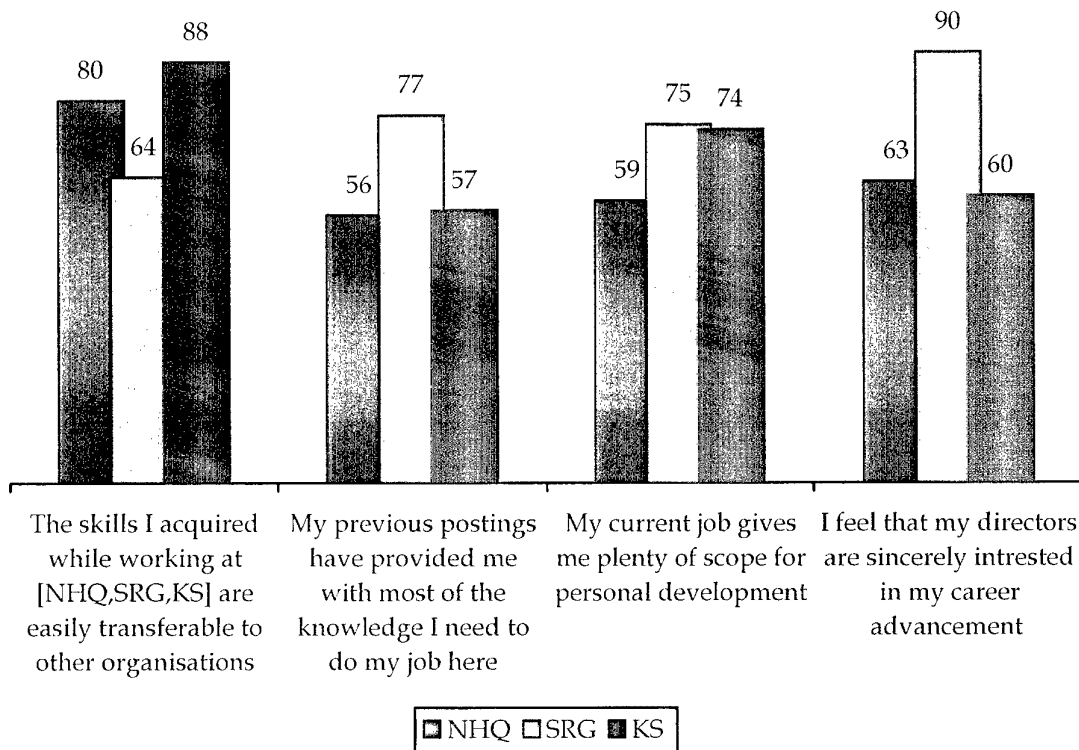


Figure 10 Career Development II - survey results

4.4.4 Job satisfaction

Job satisfaction is well recognised as a factor in worker motivation and organisational productivity. Job satisfaction as well as employee morale are influenced by many factors, including autonomy, the social aspects of the job, feedback on work performance, skill variety, job significance, perceived meaningfulness of work, and potential for personal development (Hackman & Oldham, 1980)

The survey canvassed opinions on factors relating to job satisfaction such as control over work, the workload, team support of its members and a clear indicator of satisfaction - lack of career prospects and staff turnover. Figure 11 shows that there was considerable variability among the settings in regard to their perceptions of sense of control, conflict management and understanding what is expected in the workplace. In all settings studied team support played a vital role in staff job satisfaction.

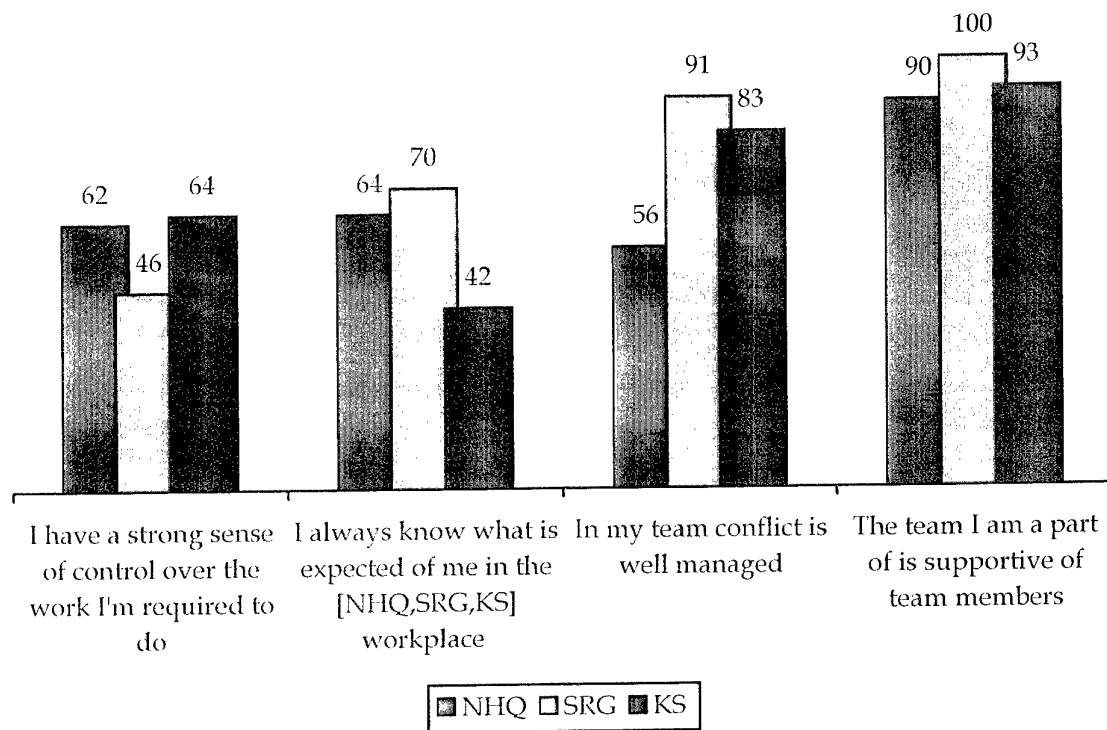


Figure 11 Job Satisfaction I – survey results

The survey also canvassed opinions on factors relating to job satisfaction such as the impact of staffing shortages, communication and praise from supervisors and the effectiveness of open plan workplaces. (see Figure 12 below).

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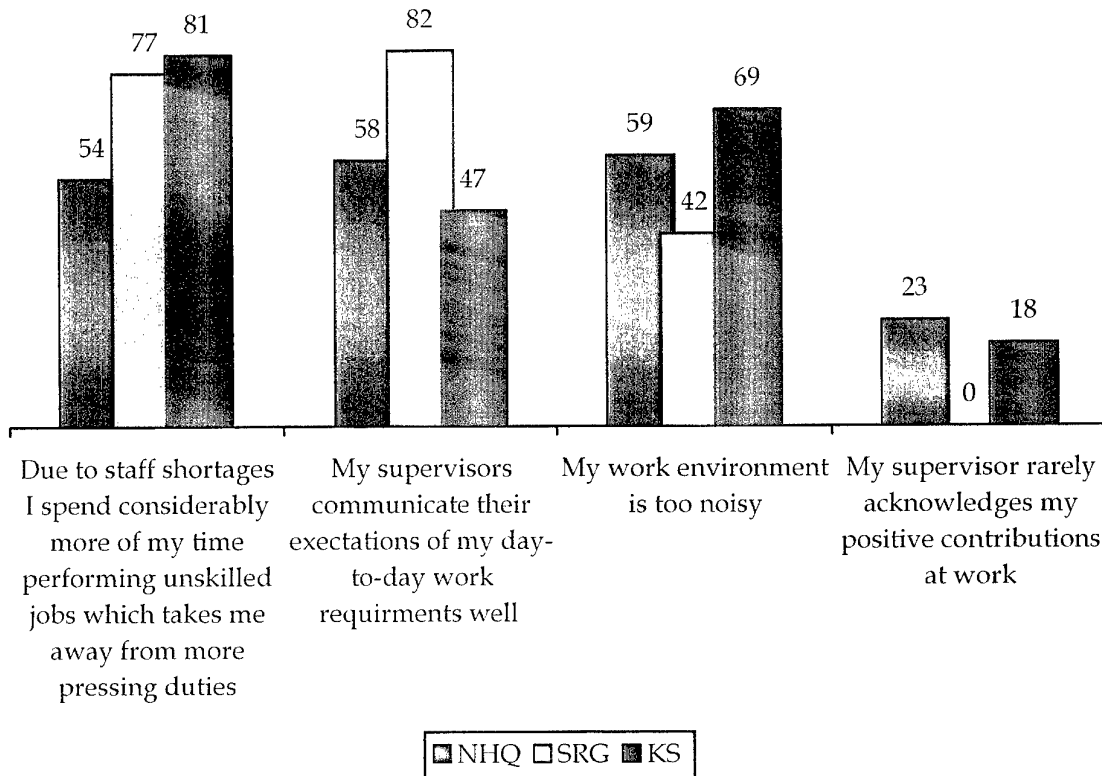


Figure 12 Job Satisfaction II - survey results

Not surprisingly, the unambiguous mission environment of the tactical headquarters at SRG appears to be the setting where social learning and knowledge management is practised most effectively. This seems to be followed by the single service strategic headquarters, NHQ, which had begun its own reform program at the time it was studied. It is the view of the research team that the predominantly single service cohesion and subsequent goal alignment enhanced social learning in that setting. Finally, although many social learning and knowledge management enablers are being practised within the joint strategic setting, the Knowledge Staff has been subject to a series of re-organisations and changes resulting in a confusion in identity - all of which have acted as inhibitors to social learning.

5 Recommendations for the ADO

Over the four year duration of the ESLA task, the ESLA team made over one hundred verbal or written recommendations to improve social learning and KM processes within the settings studied. Some of these recommendations were necessarily setting-specific. However, a large number of issues included in the recommendations were of a generic nature and given the research team's conclusion that many of the task's findings can be generalized, a number of these recommendations could be effectively applied anywhere within the ADO.

The following is a selection of these generic recommendations. The recommendations are clustered according to the social learning constructs depicted in the Structured Social Learning Architecture, in Figure 18: Force Structure (Organisational Culture, Job Satisfaction and Morale), Capability (Information and Knowledge Support), and Preparedness (Team Building, and Professional Development). Organisational Culture is not listed separately, as all of these recommendations impact on organisational culture to some degree.

A majority of these recommendations deal with so-called 'people issues' as these issues were dominant in all the settings studied. This is consistent with the ADO's emphasis on 'Results through People'. Results - because at the end of the day this is what the management expects. People - because results can only come through people, and people are the key to superior performance.

JOB SATISFACTION AND MORALE

- ◆ Co-locate where possible. Ideally all Divisions / Branches / Directorates should be co-located. In cases where co-location is not possible, ensure that information about meetings (or cancellations of meetings) or other relevant events is transmitted to non-collocated staff in a timely manner.
- ◆ Improve the flow of information to all staff concerning restructuring - its rationale and processes by conducting regular updates and briefing sessions where staff can ask questions and voice their concerns and be assured that these concerns will be considered.
- ◆ Consult with personnel affected, and develop creative ways of making the spatial layout more conducive to work output and production. One suggestion is to provide a dedicated 'quiet' room where people can go to work on tasks that require high levels of concentration.
- ◆ Review the military posting cycle to incorporate periods of flexible postings for both men and women, particularly during child rearing years, for example, approved periods of leave without pay, secondments to industry to gain a required skills base, and even the consideration of job sharing and part-time work. These periods could include two weeks per annum of obligatory training or updating.
- ◆ Introduce more flexible military posting policies that allow for real back-to-back postings, where possible; to accommodate family commitments and adopt a new approach to managing family obligations so that families can elect to reside in the place of their choice while Service personnel are flown to postings as required, and families are funded to make regular visits.
- ◆ Ensure that jobs, which are traditionally highly valued, are not civilianised and make adequate provisions to ensure that civilianisation does not deprive Service personnel of opportunities for meaningful skills development.
- ◆ Appoint a Military Service Officer to act as a bridging agent between the Service and civilianised duties that significantly impact quality of life or Conditions of Service issues for Service personnel - not to manage the contract, but to communicate Service special needs and / or civilian constraints and to ensure the duty of care is maintained.

INFORMATION AND KNOWLEDGE SUPPORT

- ◆ Develop and promulgate local protocols on the structure and use of shared drives. At least one staff member should be appointed to be responsible for maintaining accuracy, consistency and relevancy on the shared drive. These duties should be considered as that staff member's highest priority.
- ◆ Implement a records management program in consultation with the Central Registry of the Department of Defence and with advice from the National Archives of Australia. Implement a records management program that can provide:
 - a definite retention schedule for both paper and electronic records (determined by the statute of limitations or users' needs);
 - a comprehensive record inventory (database listing the different types of records);
 - a process of identifying and protecting records deemed vital;
 - a management strategy for inactive records;
 - a records management manual so that personnel at all levels would have easy access to policies, procedures;
- ◆ Institute formal processes for group sessions for inquiry and reflection and encourage individual inquiry and reflection by allowing staff member's official time for this process and by rewarding positive outcomes from this process.
- ◆ Make the imperatives and decision-making process of senior managers more transparent to junior staff and give them an opportunity to input into decision making, for example, minutes from senior staff meetings could be circulated by e-mail and comments solicited from junior staff.
- ◆ Set aside some meetings primarily for the purpose of information exchange and sharing. This should include an opportunity for staff, regardless of rank or level, to freely vent their concerns and frustration without fear of retribution. This could be combined with a 'Reflection and Inquiry' session.
- ◆ Institute meetings and codes of conduct where members can openly share mistakes and lessons learnt without fear or shame. Make time available for each directorate / team to evaluate work processes and outcomes and to capture lessons learned and anecdotes for subsequent use by other staff. This information should be readily available to all staff.
- ◆ Encourage, support and reward the formation of communities of competence where membership is known and fellow staff can utilise and share their expertise. All staff should be made aware of the existence of such communities of competencies and their expertise area so that sharing of accurate and timely information across team / directorate boundaries can occur.
- ◆ Develop an appropriate reward and incentive scheme to create a culture where knowledge and learning are crucial to the Service, e.g. At special functions reward the most valuable lessons learned, best anecdotes and innovations, formation of new communities of competence, etc.

- ◆ Facilitate the flow of information and communication within and between directorates, all staff should be urged to make optimum use of their personal networks, to share each other's calendars and diaries, to use the shared drive, and to create "short-casts" so that branch members know where their fellows are, or will be, at a given time, and when major events are coming up.

TEAM BUILDING

- ◆ Implement the practice of public acknowledgment of good work. This could be in the form of a 'special celebration' during social events, or the public awarding of certificates. It is important that this is seen as a genuine commitment to acknowledging good work and not just as a token exercise.
- ◆ Set out criteria for team's and individual work expectations and performance measures. Make this publicly available electronically. Institute team based performance management and reward good teamwork.
- ◆ Support the building of strong relationships within teams by giving people formally approved space and time to bond at work and social occasions, for example, morning teas, lunches or dinners, and sporting events involving a number of directorates or teams. Personnel who work off-site should be particularly targeted in this process. Through such informal face-to-face events personal relationships are built and information is shared.

PROFESSIONAL DEVELOPMENT

- ◆ Create several prestigious two and one star positions for appropriate personnel as mentors (and/or scholars). These positions should be created at Defence educational institutions, so senior officers who may otherwise leave the Service could share their knowledge and experience, and younger officers can be better supported in their professional development.
- ◆ Institute regular induction programs in the organisation. An induction or handover pack should be developed for each position with information on the duties of the position, relevant reading material files, and contacts. Because many aspects of this handover pack would be useful to the staff member, ideally, the staff member should maintain and update them as living documents.
- ◆ Include comprehensive information about the hierarchy within the organisation and important inter-organisational links as well as points of contacts for personnel, pay and conditions information, in all induction programs. This information should also be easily accessible electronically through the Defence Library, or Desktop Technology like IP / TV.
- ◆ Include as part of the induction process, and maintain by supervisor briefings, a clear understanding of what is expected of team members.
- ◆ Establish formal and informal processes (a 'buddy' system) for providing information on how the organisation operates, what its rules are, how much autonomy individuals have to bend the rules when necessary, and how free individuals are to act within its perceived boundaries.

- ◆ Conduct an informal skills audit when staff first join the organisation, to map their skills and background. When necessary, appropriate training and local practices should be organised and all supervisors should take an active interest in their subordinates' professional development including maintaining their skills base.
- ◆ Facilitate enculturation by making provisions for newcomers to observe at least one of each of the Branch / Directorate meetings (other than their own) and at least one morning prayers session and/or other meeting early in the posting cycle. An experienced officer should accompany these staff members to answer questions and clarify any confusing issues. The time commitment involved would be paid back by the new employees' faster orientation and understanding of the type, range and importance of work performed at a given setting.
- ◆ Establish and actively support a mentoring program. Mentors should not be the same people as those who are managing the performance of individual staff members as it may lead to a conflict of interests or inhibit openness.
- ◆ Develop a central web page within the Service (or Division) portion of the intranet where information about professional training programs can be collected, as well as staff comments regarding courses' relevance.
- ◆ Ameliorate the 'up or out' policy, by creating more positions at each level, so that those that prefer to stay at a certain level can seek rewards by proving themselves to be increasingly proficient at that level. Possible rewards may be recognition for becoming Master of a certain rank, and/or increased performance-linked increments within ranks.

The recommendations above are not intended to be prescriptive for each and every organisation. They are offered more as a range of options which organisations can selectively apply depending on their primary needs and values. The definitional tool discussed in the next section can be used to assess the practicalities of this selection.

Organisational culture is the single most important issue for effective social learning and knowledge management in an enterprise. In order to do this a cultural shift is required to move from being a traditional organisation to becoming a learning organisation, in other words, from:

- ◆ being Dividers of knowledge, where knowledge is controlled and divisionalised, to being Integrators of knowledge, where knowledge is integrated and easily available;
- ◆ from having knowledge boxed and 'sticky' (hoarded and rigidly applied) to having knowledge which is mediated, flows and is freely shared;
- ◆ an organisation where competencies are core rigidities to an organisation based on Communities of Practice;
- ◆ Restrictive skill ranges to innovative skill sets
- ◆ Specialist training to cross-cultural and cross-disciplinary learning
- ◆ Fear of discontinuity to enjoying life-long learning

5.1 Getting Started.

There are a number of guidelines available for initiating and implementing KM cultural changes. The following are a set of guidelines that the ESLA research team believes may be of utility to organisations within the ADO:

- ◆ Start your knowledge analysis with all your stakeholders; What do they need to do their jobs more effectively? They will give you your business case for change.
- ◆ The business plan drives the KM strategy not the other way around.
- ◆ Hijack existing processes or procedures where possible, particularly in the early stages - don't create new ones.
- ◆ Make sure your intent is clear and explicit and explain it to everyone. (i.e. Build trust by beginning with discouraging mis-trust.)
- ◆ Organic rollouts are easier, more effective and create less expensive mistakes. This doesn't have to be a discrete project in a small part of the organisation, it can be a small change in an existing process throughout the whole organisation.
- ◆ Provide tool kits at the operations level to enhance sharing and learning. Team Management Index Myers-Briggs etc, can help.
- ◆ Capability building, coaching, feedback, creative thinking, presentation and facilitation skills. (The ability to share the knowledge in a way that is fun and creative.)
- ◆ The physical environment is very, very important in creating a learning environment. You need a discrete space. (A coffee shop, whiteboards) Simple, open-plan offices will not do!
- ◆ You need champions and role models. (Don't wait for everything to be perfect, roll it out early and get feedback and replace it. This promotes ownership and trust. The quicker you can incorporate the ideas the quicker you can get buy-ins and trust.)
- ◆ Take some baseline measures so that later you can give some measures of success. You may not be able to attribute all success to your initiatives but you can still use it to measure success down the track.
- ◆ Make managers accountable for the process.
- ◆ Design dialogue services into your process.
 - What did I learn?
 - Who did I share it with and how did I?
 - What are my learning opportunities/Share it, objectives for the next person.
- ◆ Ensure alignment of reward structures and roles. (eg The project must have created new knowledge, recorded and disseminated to three other projects in the organisation and the knowledge must have been used on those projects.) You need to be able to set up processes where questions are asked and knowledge is actioned to entice the reluctant to share.
- ◆ Ditch processes that don't work, fast.
- ◆ Ensure you have processes that push and pull the organisational information.

- ◆ Make your processes of as invisible as possible. Make them a part of the normal business.
- ◆ Build on a "I don't know?" is OK culture.
- ◆ Start Now!

(Cosgrove, Thomas, presentation at the Knowledge Management Conference, Datatech, August 9, 2002, Sydney)

6 Emergent Social Learning Architecture descriptions

The initial development of the social learning architecture started at high levels of abstraction with the view of drilling down to more detailed levels as the work progressed. The social learning architecture, in the first instance, was thought of in terms of a map that an organisation could use to gain a better understanding of the major elements and effects of social learning and the organisational knowledge management issues that support it. These diagrammatical representations were largely descriptive.

This first model used to denote the identified factors in social learning was variously represented as shown in Figures 2, at the beginning of Section 4, and Figure 13, below. These figures depict five different factors that effect social learning effectiveness in an organisation: the set of values that underpins social learning (detailed in Figure 14); the environmental context in which processes and strategies operate (as depicted in Figure 17); and the enabling processes and strategies (as shown in Figure 15 and 16). The Enablers can, from time to time, be either challenged or inhibited by these elements; examples might include uncertainty of budget allocations, destructive work practices, a highly politicised environment, organisational change (and the resultant change fatigue), and changing organisational cultural values.

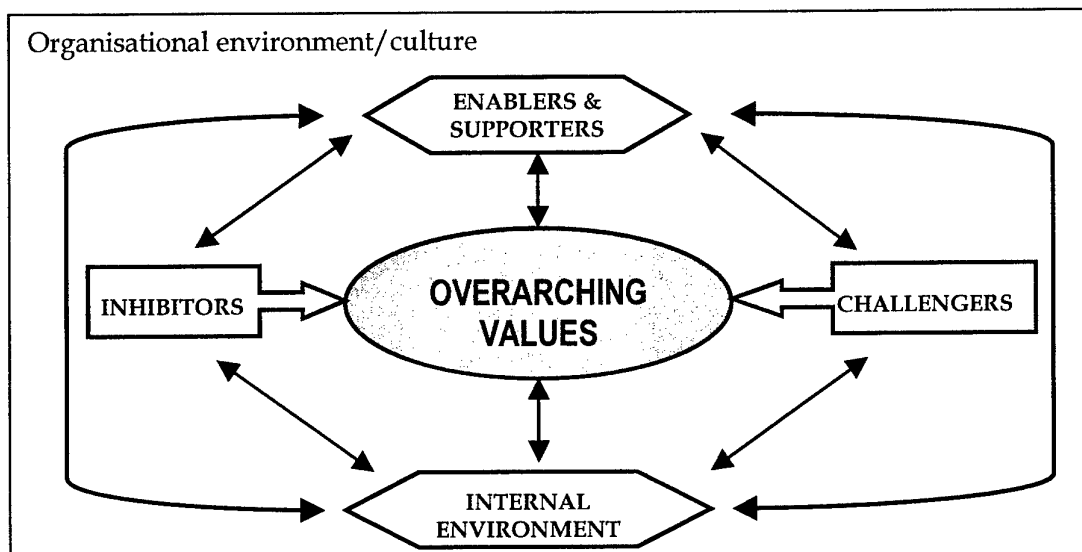


Figure 13 Factors impacting on social learning in organisations

The concepts underlying these representations remained remarkably stable throughout the four years of the research study and are still useful in enhancing understanding of the essential social learning concepts and how they interrelate.

6.1 Organisational Values

Another stable aspect of the research findings was the set of organisational or cultural values that support effective social learning and knowledge management practices. These did not vary significantly in any of the settings studied, although, in some cases, it was their absence that made their importance clearer. These values were delineated in the introductory paragraphs of Section 4, but the graphic representation appears in Figure 14 below.

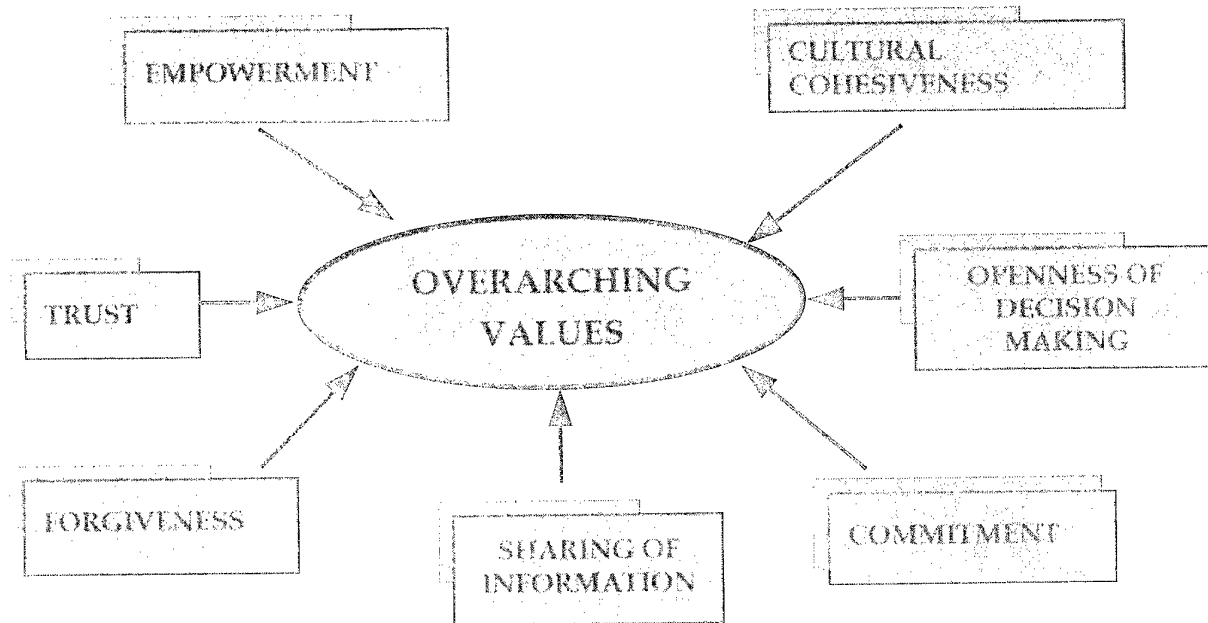


Figure 14 Factors impacting on social learning: Organisational Values

Discussion of the role of these overarching organisational values in nurturing the identified motivating and enabling social learning processes and strategies can be found elsewhere (see Agostino et al, 1999; Ali et al, 2001; Warne, 2000a; Warne et al, 2001).

6.2 Enablers of Social Learning

Analysis of the data led to the identification of a set of factors that support and enable effective social learning to take place. These factors were referred to as enablers, or, sometimes as motivators, and represented processes and strategies that, if practiced appropriately in an enterprise, facilitate and develop social learning and knowledge management practices. These enablers varied very little from setting to setting, although clearly some were more important in some settings than in others, so the research team was able to compile a list of enablers that applied, at least to some extent, in all the settings studied.

However, these enablers were multi-layered, intertwined and interrelated, so representing the findings effectively proved to be a challenge. The team began by grouping enablers under a variety of social learning 'constructs' depending on the purpose of the representation. At the early stages of the project, the enablers were grouped under seven basic social learning constructs that the research team determined to be the most meaningful at the time: Common Identity, Problem Solving, Team Building, Access to Information, Development of Individual

Expertise, Communication, and Induction and Enculturation (see Figure 15 below). The constructs overlap in order to represent their interrelationship.

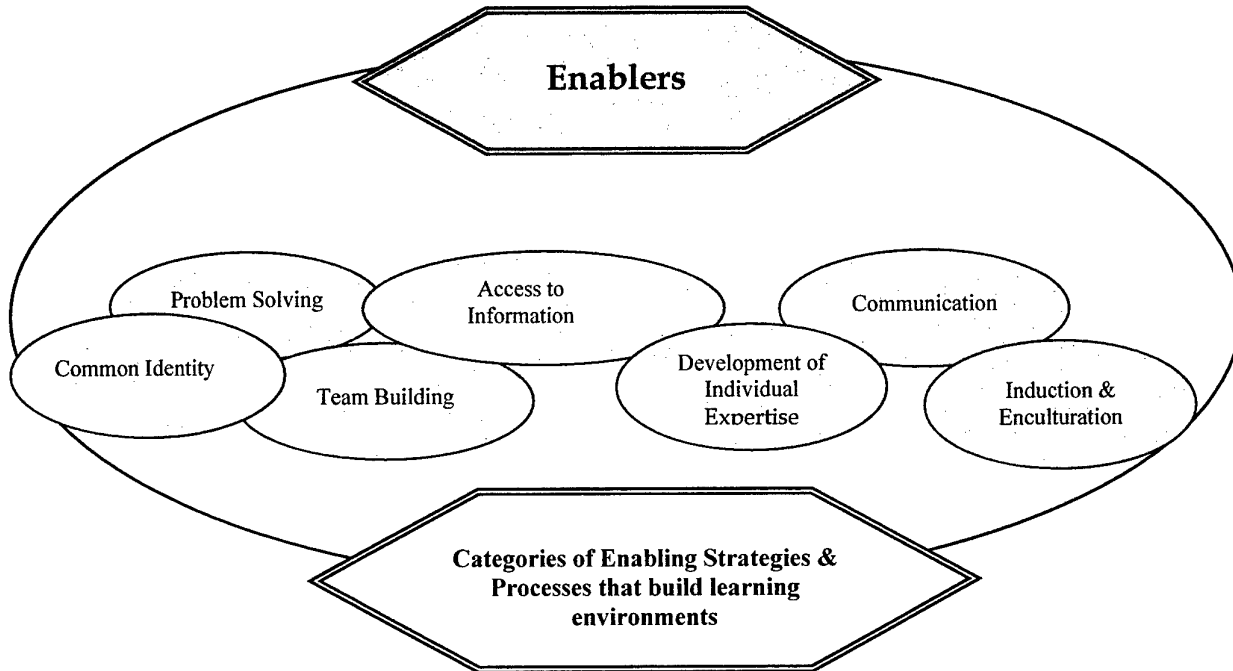


Figure 15 Factors impacting on social learning: Categories of Enablers

Common Identity – a common ground/understanding to which many people/groups can subscribe, and requires a shift from seeing oneself as separate to seeing oneself as connected to, and part of, an organisational unit. Based on our research, issues impacting on *Common Identity* are: goal alignment, cultural identity, gendered identity, language, morale, and workplace design (spatial and physical design).

Problem Solving – a core activity. Problem solving fosters social learning, because each instance of problem solving represents an opportunity to generate knowledge. Issues associated with this enabler are: networking, improvisation, perceptions of the organisation, systemic understanding, and a time for inquiry and reflection.

Team building – working together and understanding what each member is trying to do. Team building is essential to organisational success for effective social learning and problem solving. Issues associated with this enabler are: leadership, team-based morale, performance management, public recognition and reward systems, use of humour, and workplace design.

Access to information – the easy availability of corporate information, in whatever format. Access was observed to have a direct input into knowledge acquisition and generation of new knowledge and thereby, social learning. Issues associated with this enabler are: record keeping, networking, meetings, and information technology (IT) infrastructure.

Development of individual expertise – the acquisition and development of expertise was seen as an integral part of social learning. Issues associated with this enabler are: career trajectories, professional currency, professional training, postings and promotion, and mentoring.

Communication – this enabler was observed to be essential to effective learning within an organisation, and to effective social learning. Issues associated with this enabler are: overall communication climate, formal and informal information flows, time for inquiry and reflection, use of humour, language, and workplace design.

Induction and enculturation – facilitates social learning by providing a foundation upon which an individual can become fully productive. Issues associated with this enabler are: timeliness and comprehensiveness of the process, buddy/mentoring system, handovers and information packages, and training.

As the study progressed, it became clear that the enabling strategies and processes were so interrelated they could be grouped under a variety of social learning constructs depending on the purpose of the representation. In some cases, it was useful to represent the enabling processes themselves as constructs. These constructs were refined and redefined as seemed most appropriate in each setting, as were the enabling processes and strategies that fell within the categories.

An early representation of the enablers falling under each construct appears in Figure 16 below.

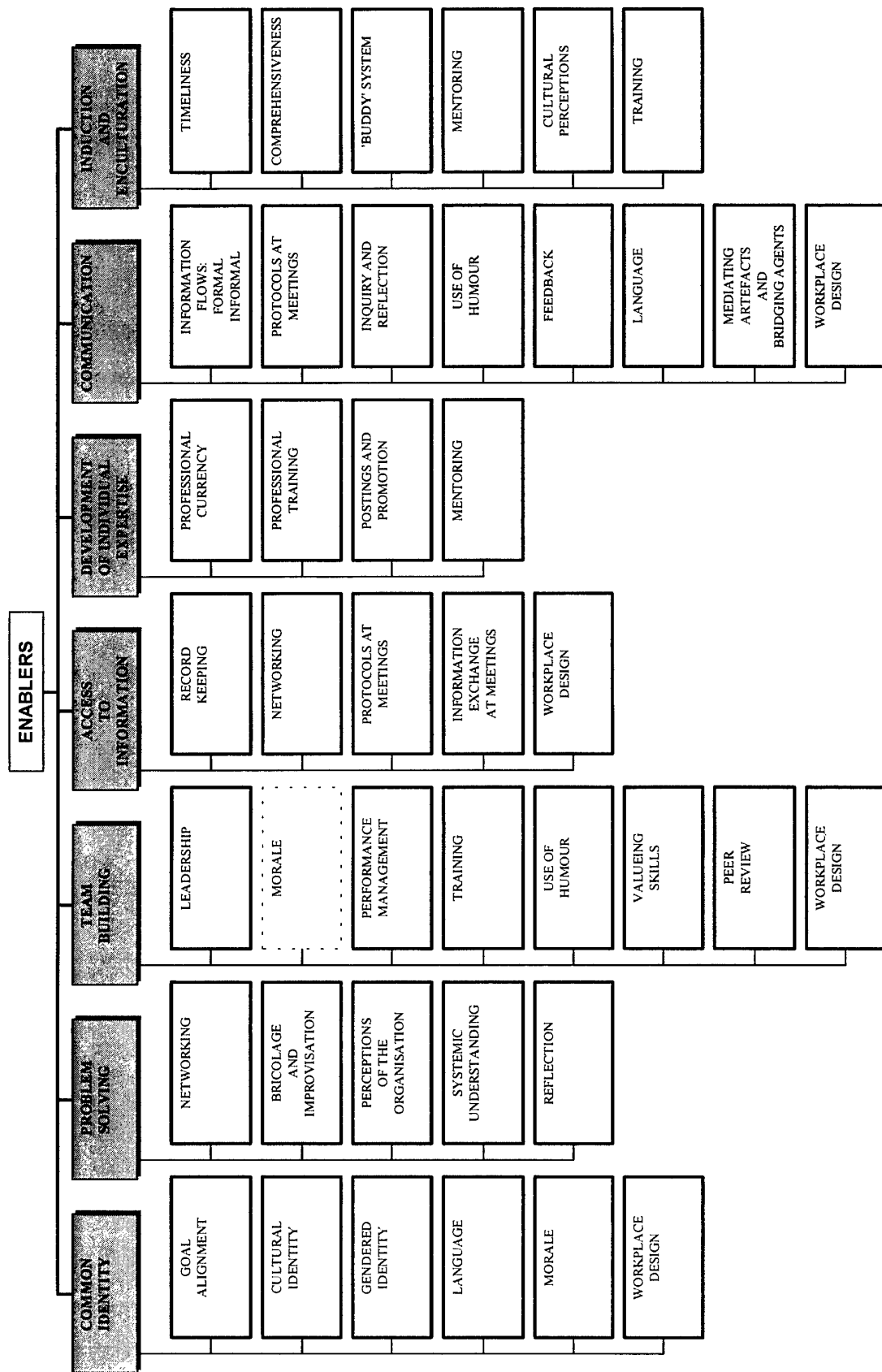


Figure 16 Factors impacting on social learning: Enablers

The enablers represented in Figure 16, are not necessarily exhaustive; nor does the order in which they appear imply level of importance or value to social learning; however, each enabler was observed to have an impact on the effectiveness of social learning processes. Several of the enabling processes or strategies appear in more than one category as they play a role in supporting a number of social learning constructs. In some cases, the same enabler can be effectively applied to support one of the social learning constructs, but may only be partially effective, or even ineffective, in supporting another social learning construct.

Even this representation of the findings proved problematical at times. Because of the complexity of the issues under investigation, the constructs sometimes seemed to be processes, and the enablers themselves became constructs. The diagram was considered to be too complex, too unwieldy and too repetitive to be meaningful as a generally applicable architecture. However, as a tool for informing a specific organisation, this representation became very useful. When disseminating research findings to organisations, the research team coloured the enabler boxes on this representation green, amber or red (for enablers that were perceived to be operating effectively, partially effectively, or ineffectively). This was an effective and popular way of conveying an immediate picture of the social learning and knowledge management maturity of the organisation. In this way, this model was used for detecting and addressing organisational processes that were acting as inhibitors to social learning in the organisation. The coloured diagrams (see Figures 3 and 4), which became affectionately known as the 'fruit salad' diagram, was also used to help clarify and prioritise requirements for effective social learning, and to input into future planning, thereby fulfilling some of the identified roles of social learning architectures.

6.3 Environmental Factors Supporting Social Learning.

The research data further indicated that the enabling processes and strategies could not operate in isolation. They require an organisational environment that supports social learning. The characteristics in the environment (Figure 17) provide a context in which the Enablers operated most effectively.

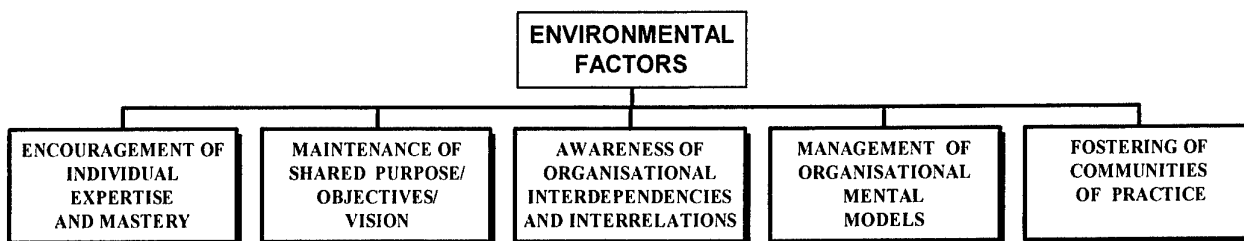


Figure 17 Factors impacting on social learning: Environmental Factors

This level of abstraction was a useful early tool for the research. However, it quickly became clear that the features of the environment were not as stable as the overriding organisational values, or even the enabling processes and strategies, because it was dependent on, and subject to, the priorities and objectives of the organisation itself and the relative dominance or perceived importance of each of the identified organisational values in the different settings. However, this concept is still an important part of the high level abstraction represented in Figure 13 as it shows that the success of the all important organisational values and enablers is dependent on a

receptive and supportive organisational environment. Nevertheless, future research concentrated more on values and enablers.

6.4 Structured Architectural Representation

As the study progressed and the research team's understanding of the complexity and effects of the enablers developed, the research team refined the grouping of these enablers as represented in Figure 18. This figure represents the ESLA Study's collective findings in terms of a structured architecture that is believed to be a generally applicable architecture of social learning and knowledge management enablers in organisations.

While people are essential components of any organisation, they are an even more important component of the ADO's capability. This 'people' capability is dependent on effective force structure and the forces' level of preparedness. Similarly, effective social learning capability is also dependent on satisfactory force structure and in itself is a form of 'people' preparedness.

Therefore, the identified social learning enablers have been assigned to three categories: Force Structure, Capability and Preparedness. (In purely civilian organisations, this easily translates to Work Force Policy, Capability and Competencies). Within each category, the enablers have been grouped under social learning constructs.

Just as Force Structure, Capability and Preparedness impact on each other in cyclical, recursive and iterative ways, so the identified social learning enabling processes or strategies can appear in more than one category as they can play a role in supporting a number of social learning constructs. In some cases, the same enabler can be effectively applied to support one of the social learning constructs, but may only be partially effective, or even ineffective, in supporting another social learning construct.

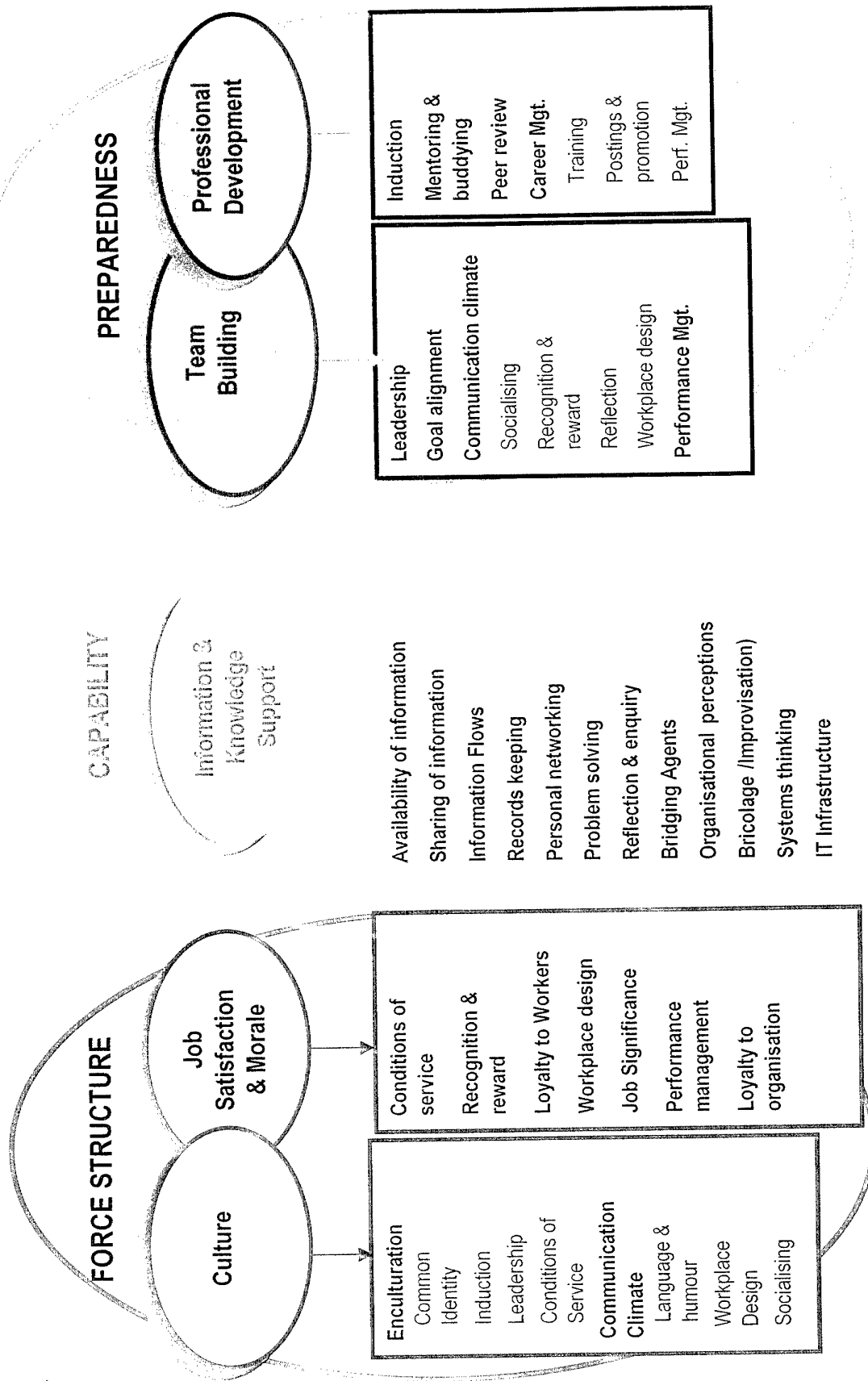


Figure 18 Structured Social Learning Architecture

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In this representation, the earlier social learning constructs identified in Figures 15 and 16 have been subsumed by the constructs in Figure 18. For instance, Development of Individual Expertise and Induction and Enculturation became part of the Professional Development construct. Communication, as depicted in the earlier figures, was considered to be a pivotal enabling process inherent rather than separate from the other social learning constructs and so has been incorporated into them.

The elements in Figure 18 overlap in order to represent the interrelationship between all the enablers. Further details of these social learning enablers, and of the findings on the role of trust and organisational cultural elements in the social learning process occur elsewhere (see Ali et al, 2002; Warne et al, 2001).

6.5 Knowledge Management and Social Learning Tools: Definitional Models

The next stage in the representation of the ESLA Study findings was to develop architectural tools to assist organisations in implementing social learning, by providing a disciplined approach that can be applied under the umbrella of each organisation's own cultural values. There were two steps in this process: a toolset abstraction model and a definitional architecture.

6.5.1 Toolset Abstraction

To do this, it was necessary to take a different conceptual view of the research findings, and to use a fresh lens to examine the relationships. The enabling processes and strategies discussed in the previous section were collectively conceptualised as a learning Toolset of actions, processes and strategies that an organisation can use to facilitate its activities and help achieve required organisational outcomes. This toolset could impact on social learning and knowledge management in four distinct ways: as a motivator, enabler, challenger or as an inhibitors (Linger & Warne, 2001), which are referred to as Effectors.

The organisational values arise from the balance of these organisational effectors, but in turn, the values inform these effectors and how they are balanced. These reciprocal and interdependent relationships are the essential element of social learning. The values within the organisation are, therefore, pivotal to the successful implementation of social learning and knowledge management tools. Values steer the way the tools are implemented and accepted, while the way the effects of these tools impact on the organisation shapes the organisational values themselves. While motivators form a sound foundation and enablers provide the bricks or building material, the values are the mortar that binds the whole together.

Challengers and inhibitors are environmental or personal factors that impede or erode the organisation's continued robustness. This representation also shows that the organisation's social learning and knowledge management performance influences its values. This introduces a temporal dimension into the dynamic, as there is often a

temporal distance between an outcome and when it is reflected back on the organisation by the external environment. This is indicated in Figure 19 below by the arrows originating with the organisational outcomes.

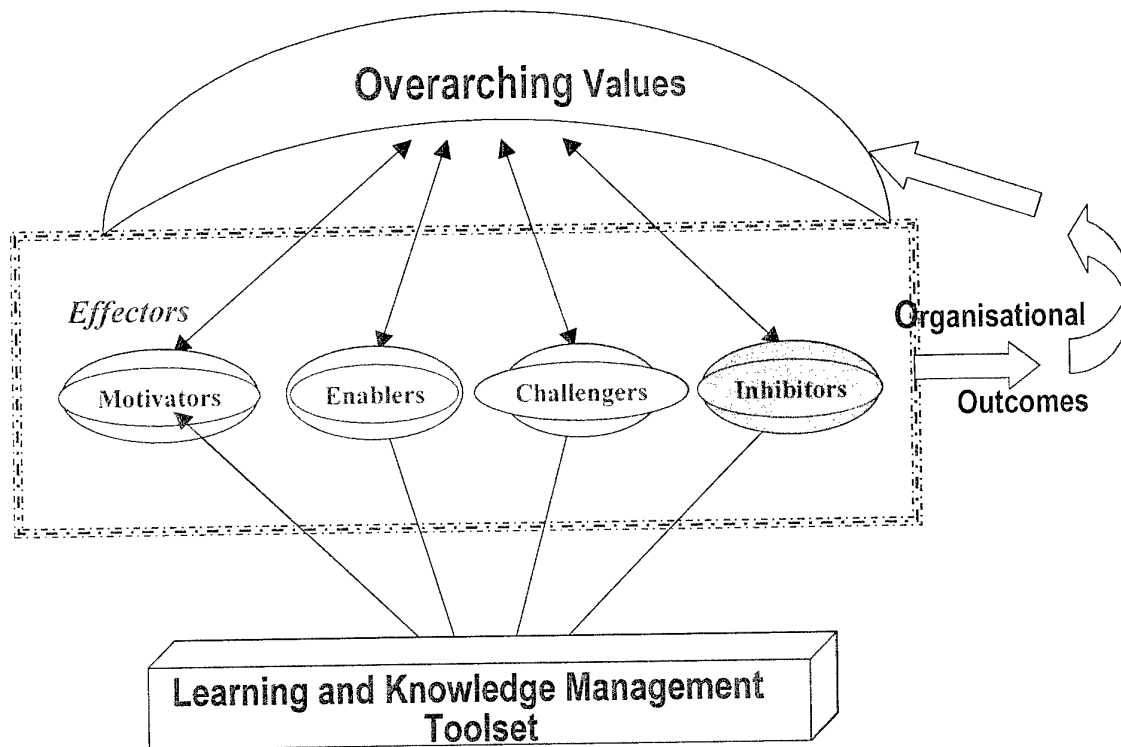


Figure 19 Toolset Abstraction Model of Social Learning and KM

For example, an important element of generative learning is for organisational members to be able to engage in dialogue, which is open and based on inquiry and reflection. A supportive communication climate is a prerequisite for such dialogue and it requires learning how to recognise defensive patterns of interaction that undermine learning (Ali et al, 2000; Senge, 1992). As well as improving the quality of the reflection, group reflection also contributes to the development of a common identity and a shared understanding amongst the participants. However, an additional and obvious requirement for such dialogue is having the time to engage in it.

In many organisations there is little time to reflect, learn from experiences (irrespective of whether the experience was a success or failure) and generally discuss work matters. Workload can be seen as a factor preventing people from setting some time aside for

thinking and reflection but far more important is whether or not the organisation prioritises and values dialogue and reflection over other activities. On the other hand, many organisations demonstrate that they recognised the importance of inquiry and reflection at a group level by making it a priority and making time and space available for it. This prioritisation, and the allocation of time and space, is a tangible demonstration of the organisation's commitment to such social learning processes.

Reflection as a tool is an enabler, because it allows individuals to remove themselves from the actual performance of the activity and provides the space and distance they need to better understand the activity they are engaged in. Reflection as a motivator allows the individuals to learn from their engagement in the activity, with the intention of instigating some form of improvement of the activity. This level of control is empowering. However, reflection requires time that takes the individual away from the performance of other activities. The challenge is how to accommodate reflection in the individuals' work practices. Reflection is also an inhibitor, as it is often an unacknowledged and unrewarded activity. The organisational outcome is determined by how these four effectors are applied in a particular situation. It is the net balance that defines the outcome. Moreover, the net balance also impacts on the overarching organisational values. For example, if, on balance, reflection is predominantly a motivator and enabler, it contributes to defining empowerment as an organisational value. Simultaneously, empowerment, as a value, exerts an influence on how the tool, reflection, is viewed in the organisation.

6.5.2 *Definitional Architecture*

The next step in the process was to map the findings to a Definitional Architecture in which each of the processes and strategies could be defined in terms of the two levels that were the most enduring and pervasive aspects of the research findings. These two levels were the organisational values (or culture) that support the tools; and the organisation's Communication Environment which is the context for the tool. The Model also had to include the Practicalities for the use of the tool. Furthermore, the spatial and temporal aspects discussed in the previous sections needed to become more explicit. After much discussion and testing against the data, the representation shown in Figure 20, below was developed.

In this representation, the Organisational Values become the Cultural Level. The Communication Environment is modelled in terms of time, space and information, where time is allocated, scheduled and prioritised for the tool's use; Space refers both to conceptual and physical space for the tool; and Information refers to the organisational information required to effectively apply the tool. The Practicalities are defined in terms of Skills required to apply the tool, a description of the Process to be applied, the person or persons Responsible for applying the tool and the appropriate Application of the tool.

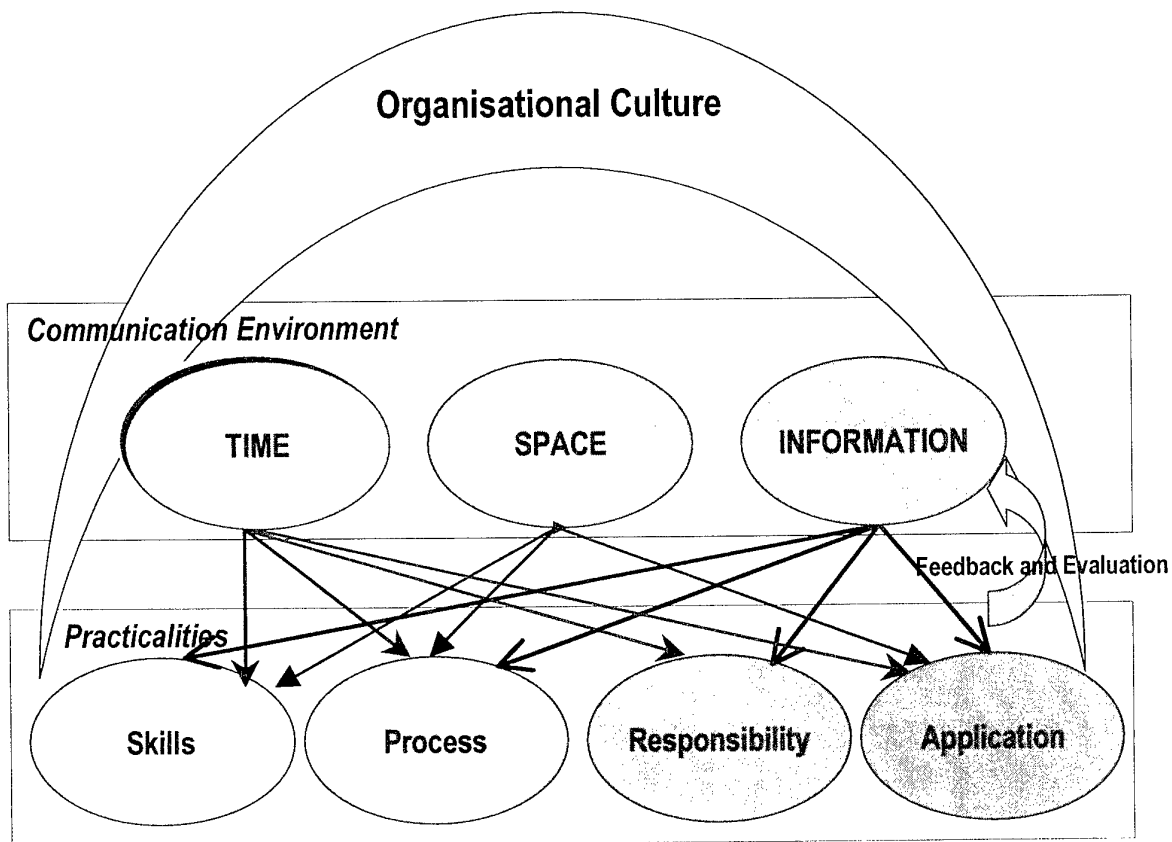


Figure 20 Definitional Architecture for Social Learning and KM Tools

This architecture provides both a definitional and a diagnostic guide for organisations.

The actual definition of the tool occurs at the third, Practicalities layer, and these practicalities are informed by the Communication Environment level. This diagnostic level tells the user if there is enough time, space or information available to use the tool effectively and if it is consistent with the organisation culture, which impacts at all levels. The results of the practicalities layer feedback into the information module of the Communication Environment layer.

The Organisational Culture level of this architecture represents the individual and accumulated core organisational values that support social learning and Knowledge Management within the particular enterprise in which the tools are being applied. If the tools and the Communication Environment are not supported by appropriate

organisational values, the proposed tools cannot be applied successfully in the long term. However, if the purpose of the application of social learning and knowledge management tools is to change or shift the organisational culture, then the tools could be applied experimentally with the proviso that regular and widespread feedback and evaluation of the tools be practised explicitly as part of the experimental process.

Returning to the tool, 'group reflection' as an example, if empowerment of personnel is not one of the organisation's core values, then an empowering tool like group reflection will not succeed. However, the application of this tool could be introduced in a limited, controlled experimental way to gauge the value of this activity within the organisation.

The Communication Environment level of this representation includes Time, Space and Information, all of which interact to optimise the use of the tool, and, which are dependent on the support of appropriate organisational values. For tools to be effectively applied, the organisation must be prepared to assign time to them. This includes time in terms of prioritisation so that the time is seen to be available for this activity, and scheduling, so that this activity is seen to be planned for as a regular, valued organisational activity. Space also needs to be assigned in the communication environment for a tool to be successfully practised. This includes appropriate physical space, where an individual or a group goes to perform an activity, and, more importantly, conceptual space that grants workers implicit permission to engage in the tool. Information refers to any or all of the different forms of verbal, written, digitised or implicit information required to use the tools.

For instance, to practise group reflection, the enterprise needs to prioritise the activity giving implicit permission for employees to use it. The organisation should also provide some guiding parameters in terms of ideal frequency and duration of time (although this may differ in different work areas) and a meeting room, or other appropriate space should be freely available. Furthermore, the organisation should provide whatever information infrastructure each work area requires to successfully practise group reflection.

The Practicalities level is where the tools are defined for the organisation. Any skills required to apply the tool are identified, and if necessary training provided to acquire these skills; the process itself is described, and attempts made to verify if it is already in use in parts of the organisation. Many social learning and knowledge management processes and strategies are practised informally, and sometimes unwittingly, in teams and groups in organisations because they facilitate team building and job satisfaction – these people can guide the organisation in the introduction of formal processes. At this level of the architecture, the people with the authority and responsibility for practising the tool are identified. Finally, the appropriate application of the tool is described in terms of time, space, information, skills, and responsibility. Each of these actions will obviously be modified by the appropriate organisational values.

For group reflection, this would mean discovering if and where the tool is already being practised in the organisation, and seeing if this can inform the other definitional aspects of

the tool. The skills required could be as simple as a set of meeting protocols to ensure that group reflection sessions engage in true reflective dialogue, or if necessary, the training and provision of facilitators for group reflection sessions. The process should be described in terms of appropriate protocols, and should include information on defensive or critical patterns of behaviours which may undermine the process. Desired outcomes in terms of strategic thinking, the development of a common identity and a shared understanding amongst the participants should also be described. Ideally, the organisation should specify that all employees have the responsibility and authority to practise group reflection. Finally, the application should be described in terms of how, who, where, when and why.

Outcomes and reflection on practising particular social learning and knowledge management tools should feedback into the communication environment level, so the organisation can improve or modify the tool as appropriate. If the tool is introduced experimentally into an organisation that does not have the appropriate organisational values in place, this feedback and evaluation process should be frequent, explicit, and inclusive and the outcomes of the process made freely available.

6.6 Other Outcomes from the ESLA Task

The ESLA research team is often approached for input into organisational learning, knowledge management and change initiatives, not only within the ADO, but also in other organisations and in the academic community.

The ESLA task has been asked to make contributions to a number of ADO initiatives, over the duration of the task including:

- CKO Advisory Group,
- DSTO KMKO (Knowledge Management, Knowledge Operations Forum),
- Defence Knowledge Management Forum (Jedi Council),
- Analysis of the Krait 00/1 War Game (ISR and Force Protection), in April 2000,
- Organisational Renewal Process through ASOR (now ASDR), who subsequently sponsored the team's next task,
- Strategic Workforce Planning Review under Peter Sharpe

Furthermore, the team's advice is frequently sought by individuals within the ADO, either those seeking to implement social learning and knowledge management programs in their own part of the organisation, those seeking information on possible programs or those seeking answers to questions. Where we have not been able to help personally, the team has generally been able to direct enquirers to other sources of information or advice.

The team has also collaborated with universities and other researchers, and this led to the award of an ARC Discovery Grant on Knowledge Systems, for 2002-2005, and invitations to speak at conferences. Most recently, in June this year (2002), the team was invited to present a Panel Discussion at the European Conference on Information Systems (ECIS), in Gdansk, Poland. The team was invited to present their work as part of a panel at the

Knowledge Management Workshop at the University of Wollongong in September. Another panel prepared and to be chaired by the ESLA team was delivered at the 13th Australian Conference on Information Systems (ACIS'2002) in December 20 and a full day workshop was held at the Hawaiian International Conference on System Sciences (HICSS-36) in January 2003.

Over the duration of the task the ESLA research team has published over twenty refereed papers, in both national and international journals, monographs and in the proceedings of academic national and international conferences. These publications are listed in Appendix C. At the time of going to press, four further publications were in process: a chapter in an Australian Textbook on Knowledge Management, one paper from the proceedings of ICCRTS in Quebec City, and three papers for national Knowledge Management conferences.

6.6.1 Future Implications

Effective knowledge management and social learning now appear to be acknowledged as important initiatives in the ADO. Many of ESLA's recommendations have been implemented in the areas studied, and we believe will continue to be, as awareness of the importance of these issues grows. The task has also provided the ESLA research team with invaluable experience which will contribute to new tasks it becomes involved with.

7 Lessons Learned

In order to "practice what we preach" the ESLA team was keen to capture any lessons learned from the task once completed, and engaged a consultant to lead the team through a reflective learning history process. A learning history is a formalised process for capturing and presenting learning processes. It is a multi-staged process that creates a feedback cycle to encourage reflection on shared activities. In order for learning to be understood, what occurs as learning takes place needs to be described and documented first. A learning history does not only include descriptions of activities and results, it also includes underlying assumptions and reactions of everyone involved in the shared experience. Because no individual view can encompass more than a fraction of what happened over the course of the activity or process where the learning took place, the views of all participants should be reflected in the learning history. The stages included are: Planning; Reflective Interviews, Distillation of Results; Writing the Learning History; Dissemination Workshop; Review of the Learning History Process.

The Learning History conducted in March and April of 2002 produced the following results.

7.1 Lessons about Task Management

There were a number of aspects of team management that worked very well for the team. One of these was the two-phase approach to the task, which allowed the team to feedback regularly to the client on the immediate issues of most relevance to them (social learning and knowledge management in their areas) as well as giving the team the opportunity to collect large amounts of comprehensive and diverse data for the larger, long-term task of developing architectures. This shorter turn-around maintained the clients' involvement in the task and ensured good relationships with clients in each setting. Other measures used to facilitate this relationship were:

- ◆ brief monthly progress reports to the client, which although sometimes perfunctory, provided a regular opportunity for dialogue about the task; and
- ◆ rather than use the lengthy DSTO Client Report process for reporting back to clients, the team produced what they termed 'Client Task Reports' which bypassed the formal processes and produced a much more timely turn-around for the client.'

Time and scheduling proved to be somewhat problematic over the duration of the task. It is to the credit of the team that this did not result in missed milestones. However, it did result in onerous and unsustainable workloads for several periods during the four years of the task. Lessons learnt about scheduling included the importance of:

- ◆ Planning for more time for a wider exploration of the literature during the task, as well as at the early stages;
- ◆ Allowing enough time for individual and team reflection;
- ◆ Planning for success; as the profile of the research lifted more and more requests for advice or presentations of the work were made of the team, until this averaged two such requests per week. This was not scheduled for.
- ◆ Finally, it is essential to plan in more slack for the unexpected; to allow staff time to recover from periods of excessive work and to celebrate achievements.

The ESLA team consisted of full time DSTO staff and part time academic consultants. While this was beneficial in offering diversity, it also created some administrative hurdles. For instance, there were problems with accessing the DSTO network and forwarding documents, thus hindering collaborative writing processes and adding to the workload. For the consultants themselves, the lack of continuous participation in the task meant that their contribution, on occasions, was fragmented and it took them time to refamiliarise themselves with the task progress. The primary lesson learnt from this situation is that:

- ◆ while there is considerable strength and richness to be gained from collaborating with external researchers, it would be far more efficient if DSTO employed full-time staff from these diverse disciplines to facilitate multidisciplinary research

Other more mundane task management processes were streamlined as a result of the mistakes made and learning gained during the duration of the task. These included:

- ◆ Abandoning the onerous process of keeping a comprehensive set of minutes of research meetings in favour of merely recording decisions made, the person responsible for ensuring they were implemented, and a timeline for the action;
- ◆ Recognising the need for some procedural guidelines, but ensuring that maintaining a 'Procedures Manual' was not a laborious process and did not become an end in itself;
- ◆ Respecting that everyone's time was important and ensuring that team meetings were focussed; and
- ◆ Implementing a tighter form of version control for collaborative writing.

Finally, despite the success of this task, the research team was sometimes concerned about the continued impetus for implementing the results of the research after the team has moved on from the settings studied. For instance, it became clear that once the champions of KM and social learning in C4ISREW moved on or were posted out, the enthusiasm for implementing recommendations waned until it was taken up again by a new champion in the Knowledge Staff. It may be useful for DSTO to consider embedding a full-time staff member (from the original research team) into the clients' organisation for a period of 3-6 months after research results have been presented, to assist in the implementation of recommendations.

7.2 Lessons about Methodologies and Methodological Tools

The multidisciplinary nature of the team meant that there were, initially, multiple understandings about the most appropriate methodological approaches to the research. The pros and cons of various methodologies were vigorously debated before a consensus was reached. The lessons learned from this included:

- ◆ the desirability of having a personal and collective 'faith' in the approach to the research before beginning the work, and
- ◆ the need of ensuring that all team members have the knowledge and skill necessary to apply the chosen methodology.
- ◆ furthermore, if a consensus of confidence in the work cannot be reached despite training, discussion and team building exercises, the team should be disbanded or dissenting members should move on to other areas of research.

The research team was aware that they were engaged in work that was largely alien to the 'hard-science' approaches in DSTO. In order to maintain the credibility of the research, it was important to ensure that the chosen methodology was rigorously applied and robust. To ensure this was the case, the team set out to:

- ◆ collaborate with universities where the chosen methodological approach was more commonly applied; and
- ◆ to expose the research to consistent peer review through presentation at conferences and publication in journals.

While this proved to be a very successful tactic for re-enforcing confidence in the rigour of the research, it also resulted in a frequently excessive publishing workload. By raising the profile of the work, it also increased requests for presentations and collaborations which, in itself, also added to the team's workload.

Upon reflection, it became evident that the team undertook what might be considered an over-ambitious approach. Qualitative research is both time and labour intensive, and it is important not to over-burden it with nugatory processes.

In the quest of conducting thorough research and validating all the data, the team probably conducted too many interviews at the NHQ setting. Data analysis indicated that, after a certain point, the team was not getting any new insights or richness of data and, as it turned out, the conducting of further interviews proved to be pointless. While the sample of interviews conducted at the C4ISREW setting was adequate at 22% of total staff, at NHQ, 44% of the staff were interviewed. The lesson derived from this is that:

- ◆ sample of 20-30% of total staff is an adequate representation for semi-structured interviews.

If the team had taken more time to reflect on the adequacy of the data already gathered this may not have occurred.

Another aspect of conducting qualitative research is to carefully think through and plan how the data is to be coded and subsequently retrieved. The coding of data, in particular, is a very time consuming process and the team did not pay enough attention to how the coding would impact on retrieval of information. This was largely due to their unfamiliarity with the qualitative software package N'Vivo. The end result was that there were too many code terms used and multiple code terms were applied to the individual paragraphs, thus making the data retrieval very cumbersome. This was exacerbated by the fact that the team attended the N'Vivo training course much too early, long before needing to apply it. Therefore the software was not utilised to its full potential. Lessons learnt here include:

- ◆ Know your software packages before using them – schedule training for when it can be backed up by using it.

Furthermore, the primary lesson re-inforced here is the first rule of research which is violated by the inexperienced and experienced alike:

- ◆ Know exactly how you are going to analyse your data before you collect it.

7.3 Lessons about Social Learning and Knowledge Management

One of the most interesting outcomes for the team was its own learning journey, enriched by the benefits of working with a multidisciplinary team which provided new and interesting perspectives on the work. A number of strategies were implemented to facilitate social learning and knowledge management within the team. These were very valuable, but would have benefited by having more time allocated to them. They included:

- ◆ Regular research and business meeting so all team members had an opportunity to hear what others were doing and to discuss and corroborate research findings;
- ◆ Sharing details of professional reading through 'reading club' discussions and the circulation of summaries or abstracts of relevant items;
- ◆ Developing an Endnote database of all literature relevant to the task to enable easy identification and retrieval of relevant information;
- ◆ Sharing details of conferences attended and copies of relevant papers; and
- ◆ Collaborative writing of papers.

8 Conclusion

The findings reported in this chapter, and the recommendations made, represent the collective research results from different Australian Defence Organisation settings studied, as part of the Enterprise Social Learning Architectures task at the Defence Science and Technology Organisation. These findings are multilayered and allowed the research team to pinpoint a number of environmental and cultural issues, processes and strategies that facilitate effective social learning and knowledge management. These factors provide a context, in which personnel are motivated to learn, construct and share knowledge, and suggest processes and strategies that, when present in an enterprise, can facilitate social learning and knowledge management. The ESLA researchers observed that oftentimes management invests heavily in implementing information technology (IT) in the hope of providing a seamless solution to managing information resources and organisational knowledge. While information technology can provide facilitating tools that support these enablers and motivators, it cannot, in isolation, provide an environment that will support and evolve effective knowledge management. The enablers and motivators that support the human, social and organisational needs of an organisation must first be embedded.

The focus of the ESLA research has been on the learning that takes place within social clusters in the workplace, what we have termed "social learning". This type of learning includes group members sharing knowledge between themselves and engaging in discussions that produce new ideas and better ways of working.. In an organisation like the ADO where the military personnel are moved to different postings every two years or even more often, and in an era where organisations need to be adaptive and ready to change in order to survive, the need for social learning is heightened. Moreover, the very concept of the "organisation" not only connotes but also comprises the collective activities of members in achieving organisational goals. Organisational members do not operate in isolation, and an organisation cannot function effectively unless it does so as a collective entity. The ESLA research focussed therefore on elements of organisational life that pave the way for social learning.

The research revealed a number of organisational factors that influence this orientation towards the collective that lays the foundations for social learning. These have been termed "social learning constructs":

- Organisational Culture – comprising enculturation and organisational communication climate;
- Job Satisfaction and Morale – comprising conditions of service, recognition and reward, organisational loyalty to workers, workplace design, job significance, performance management and employee loyalty to the organisation;
- Information and Knowledge and Support – comprising availability information, sharing of information, information flows, records keeping, personal networking, problem-solving, reflection and enquiry, bridging agents, organisational perceptions, bricolage (improvisation), systems thinking, and IT infrastructure;
- Team Building – comprising leadership, goal alignment, communication climate, and performance management; and
- Professional Development – comprising induction, mentoring and buddying, peer review, and career management.

In the ADO, the team found that some of these constructs hindered and others facilitated the collectivity that provides the foundation for social learning. Recommendations made to the ADO reflect means of influencing these constructs so that they will facilitate rather than hinder the occurrence of social learning. There is a tightly coupled relationship between social learning and knowledge management. In fact, social learning should be viewed as a precursor and an integral part of knowledge management.

All organisations engage in some form of knowledge management practices, either deliberately or unconsciously, formally or informally. Knowledge management seeks to

improve the utilisation of intellectual and creative powers of individuals by supporting them with information technologies and other tools, with the broad aim of enhancing their learning capability, and in turn, organisations. The research findings indicate that before such electronic tools can be implemented, it is necessary to prepare the cultural ground, and after implementation, it is necessary to maintain the cultural context. Technology alone will not create the trust and interpersonal environment necessary to achieve an optimally effective network. Organisations are not based on electronic networks alone; rather, relationships must also be constructed through face-to-face interactions. Organisations have a responsibility to sustain a culture in which learning occurs and this requires an understanding of the elements that foster the creation, sharing, and management of knowledge within and between organisational groups.

The implication of this study is that organisations seeking to improve information sharing and knowledge generation need to develop a greater awareness of the processes and strategies of organisational learning. This study indicates that information sharing and subsequent knowledge generation would be successful when interactive environments are cultivated before technology based solutions are implemented.

The social learning architecture models developed by the ESLA researchers describe how various components interrelate and interact and the principles governing their evolution. It is the researchers' belief that these representations may be useful to other organisations seeking to improve and support the cultural social learning and knowledge management tools in their organisations.

This report also includes the results of a Learning History exercise undertaken by the research team to identify lessons learnt during the duration of the task. This is incorporated in the interests of sharing knowledge with other task managers and research teams.

9 Acknowledgments

The ESLA researchers would like to thank Dr Jennie Clothier, RLJS Branch, for her vision in conceiving of this project and for her continued support and advice throughout the duration of the study.

The ESLA team also wishes to acknowledge the contribution of Dr John O'Neil, the original task manager of this task, all those who have contributed to the conduct of this research over the years, and those, like Derek Bopping and Paul Main who continue to do so.

Thanks are particularly due to the task's sponsor, Dr (previously Brig.) Tim McKenna, for his continuing support and invaluable advice, and to the various desk officers who were assigned to this task.

Our appreciations and thanks go to all the military and civilian staff we have encountered throughout our study who generously gave of their time. We have, without exception, been impressed by the co-operation and courtesy we were afforded in all the settings, and by the professionalism and dedication of the staff.

The research team would also like to acknowledge the invaluable support and good humour of our beleaguered research assistant Mr Don Taylor, throughout the study, and in particular in the preparation of this research report.

10 References

Agostino, K., R. Gori, et al. (1999). The Enterprise Social Learning Architectures Task: Context and Conclusions from the Pilot Study. Canberra, DSTO.

Agostino, K., C. Pascoe, et al. (2000). "Aspects of Collaborative Social Learning in the Australian Defence Force", International Workshop on Advanced Learning Technologies, Palmerston NZ, 4 - 6 December, 2000, the proceedings of IWALT2000 Advanced learning Technology: design and development issues. International Workshop on Advanced Learning Technologies, Palmerston NZ, 4 - 6 December, IEEE Computer Society.

Ali, I., C. Pascoe, et al. (2002). "Interactions of Organisational Culture and Collaboration in Working and Learning." Educational Technology and Society 5(2): 60-69.

Ali, I., C. Pascoe, et al. (2002). Yet Another Role for Team Building and Work Motivation-Enabler of Knowledge Creation and Knowledge Sharing. Proceedings of Command & Control Research & Technology Symposium., Monterey, CA, U.S. Dept of Defence.

Ali, I., C. Pascoe, et al. (2000). Enabling Learning: A Progress Report on the Enterprise Social Learning Architecture Task. 5th International Command and Control Research and Technology Symposium, Canberra, Australia.

Ali, I., L. Warne, et al. (2001). The Impact of Organisational Culture, Information Sharing and Collaboration on Organisational Learning: Reflections from the Study by the Enterprise Social Learning Architectures Team. Canberra, ACT, DSTO.

Ali, I., L. Warne, et al. (2001). Working and Learning Together: Social Learning in the Australian Defence Organisation. Informing Science Conference IS2001-Bridging Diverse Disciplines Proceedings (CD-ROM), Krakow, Karkow Uni of Economics, Poland, June 19-22, 2001, ISSN 1535-0703.

Bailey, K. D. (1982). Methods of Social Research. New York, Free Press.

Barker, R. T. and M. R. Camarta (1998). "The Role of Communication in Creating and Maintaining a Learning Organisation: Preconditions, Indicators and Disciplines." The Journal of Business Communication 35: 443-467.

Bednar, P. (2000). "A contextual integration of individual and organisational learning perspectives as part of IS analysis." Informing Science 3(3): 145-156.

Butterfield, J. and N. Pendegraft (1996). "Cultural Analysis in IS Planning and Management." Journal of Systems Management 47: 14-17.

Chen, P. and G. Bulluss (2000). Architecture Practice: Beyond, Frameworks and Methodologies, DSTO.

Clegg, C., C. Axtell, et al. (1997). "Information Technology: a study of performance and the role of human and organisational factors." Ergonomics 40(9): 851-871.

Davenport, T. H. (1994). "Saving IT's Soul: Human-Centred Information Management." Harvard business Review March-April.

Davenport, T. H., R. G. Eccles, et al. (1992). "Information Politics." Sloan Management Review 34(1): 53-65.

Davenport, T. H. and L. Prusack (1998). Working Knowledge: How Organisations Manage What They Know, Harvard Business School Press.

DeLone, W. H. and E. R. McLean (1992). "Information Systems Success: The Quest for the Dependent Variable." Information Systems Research 3: 60-95.

Denison, D. R. (1996). "What is the Difference Between Organizational Climate? A Natives Point of View on a decade of Paradigm Wars." Academy of Management Review 21(3): 619(36).

Galliers, R. D. (1992). Choosing Information Systems Research Approaches. Information Systems Research: Issues, Methods and Practical Guidelines. R. Galliers. Oxford, Blackwell Scientific.

Geertz, C. (1973). Interpretation of Cultures, Selected Essays. New York, Basic Books.

Hackman, R. and G. Oldham (1980). Work Redesign: Reading. MA, Addison-Wesley.

Harvey, L. and M. D. Myers (1995). "Scholarship and practice: the contribution of ethnographic research methods to bridging the gap." Information Technology & People 8(3): 13-27.

- Jackson, M. C. (1997). "Systems Thinking and Information System Development." Journal of the Japan Society for Management Information 6(3): 5-16.
- Jordan, B. (1993). Ethnographic Workplace Studies and Computer Supported Cooperative Work. Interdisciplinary Workshop on Informatics and Psychology, Scharding, Austria.
- Kidder, L. H. (1981). Research Methods in Social Relationships. New York, Holt, Rinehart and Winston.
- Linger, H. and L. Warne (2001). "Making the Invisible visible: Modelling social learning in a knowledge management context." Australian Journal of Information Systems Special Issue on Knowledge Management(December): pp 56-66.
- Meta Group (1999). "Managing change through enterprise architecture." Meta Group Practice 3(13).
- Miles, M. B. and A. M. Huberman (1994). Qualitative Data Analysis: an Expanded Sourcebook. London, Sage.
- Mumford, E. (1984). Designing Human Systems for New Technology: the ETHICS Method. Manchester, UK, Manchester Business School.
- Myers, M. D. (1999). "Investigating Information Systems With Ethnographic Research." Communications of the Association for Information Systems 2(23).
- OASIC Study (1996). Why do IT projects so often fail. OR Newsletter. 309: 12-16.
- O'Neill, J. and R. Gori (1998). Knowledge Representations for Supporting an Activity-Based Approach to Command and Control. Fourth International Command Control Research and Technology Symposium.
- Pascoe, C., I. M. Ali, et al. (2002). Collaborative Knowledge Development, Dialogue, and Team Building: Findings from Research into Social Learning in the Australian Defence Organisation. Canberra, DSTO.
- Phillips, R. A. (1997). "A Stakeholder Theory and Principle of Fairness." Business Ethics Journal 7(1): 51 to 66.
- Pondy, L., P. Frost, et al. (1983). Organisational Symbolism. Greenwich, CT, JAI Press.
- Ruppel, P. C. a. S. J. H. (2000). "The Relationship of Communication, Ethical Work Climate, and Trust to Commitment and Innovation." Journal of Business Ethics 25: 313 to 328.

- Schein, E. H. (1993). "Organizational Culture and Leadership." Organizational Dynamics. 22(2): 40-51.
- Senge, P. M. (1992). *The Fifth Discipline: The Art & Practice of the Learning Organisation*. Australia, Random House.
- Silverman, D. (1985). Qualitative Methods and Sociology. Aldershot, Gower Pub. Co.
- Tucker, M. L., P. K. Sterkel, et al. (1995). "Qualitative Research in Business Communication: A Review and Analysis." Journal of Business Communication 32(4): 383-400.
- Vandeville, J. V. (2000). "Organisational learning through the collection of "lessons learned"." Informing Science 3(3): 127-133.
- Warne, L. (2000). "Understanding Organisational Learning in Military Headquarters: Findings From a Pilot Study." Australian Journal of Information Systems 7(2): 127-142.
- Warne, L., K. Agostino, et al. (1999). C3ID Social Learning Pilot Study: Final Report (ESLA): Task Report. Canberra, DSTO.
- Warne, L., I. Ali, et al. (2001). "A Holistic Approach to Knowledge Management and Social Learning: Lessons Learnt from Military Headquarters." Australian Journal of Information Systems. **Special Issue on Knowledge Management**. (December): pp 127-142.
- Warne, L., C. Pascoe, et al. (2000). Social Learning and Knowledge Management in the Australian Defence Organisation. Proceedings of the International Conference of Systems Thinking in Management, Geelong, Deakin University.
- Webber, A. M. (1993). "What's so new about the new economy?" Harvard Business Review Jan-Feb: 24-42.
- Wenger, E. (1998). Communities of Practice: Learning Meaning and identity. Cambridge, Cambridge University Press.
- Zachman, J. A. (1999). "A framework for information system architecture." IBM System Journal 38(2/3): 454-470.

APPENDIX A:**KPMG Knowledge Management Maturity Model**

1. Knowledge Chaotic	Ad hoc systems, hoarding
2. Knowledge Aware	Understanding, planning, evaluating
3. Knowledge Enabled	Early, stand-alone initiatives
4. Knowledge Managed	Comprehensive set of initiatives
5. Knowledge Centric	Fully integrated knowledge system supporting business

APPENDIX B

Binary Agree/Disagree Results from Surveys at C31D, NHQ, SRG, & KS.

Questions	NHQ		SRG		C31D		KS	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. In my work I am encouraged to develop original ideas	88	12	100	0	72	28	91	9
2. My ideas are usually well received	95	5	100	0	92	8	95	5
3. I asked for this posting	67	33	77	23	65	35	92	8
4. The current work I am doing challenges my thinking	82	18	92	8	93	7	83	17
5. I had no choice but to take up this posting	32	68	25	75	32	68	17	83
6. This job has enabled me to learn valuable skills	86	14	85	15	87	13	90	10
7. I have a strong sense of control over the work I am required to do	62	38	46	54	37	63	64	36
8. The amount of work that is required of me is reasonable	72	28	58	42	54	46	69	31
	N/A	N/A	N/A	N/A	N/A	N/A	63	37
10. I receive adequate feedback on my work	60	40	90	10	76	24	68	32
11. I have enough resources to enable me to perform my work adequately	61	39	36	64	37	63	52	48
12. I can easily access my supervisors when I need to	83	17	92	8	89	11	84	16
13. I take part in the decision-making processes that affect my work	80	20	82	18	84	16	83	17
14. I am able to voice all my work-related opinions to my immediate supervisors	84	16	93	7	96	4	93	7
15. I have the opportunity to voice my work-related opinions to senior Defence Managers (3 Star and Above)	32	68	15	85	30	70	23	77
16. My immediate supervisors are ready to listen to my concerns	90	10	93	7	93	7	90	10
17. Senior Defence Managers value my work-related opinions	41	59	36	64	53	47	63	37
18. I would not consider a professional career outside the Department of Defence	15	85	9	91	0	100	19	81
19. The skills I acquired while working at (NHQ,SRG,C31D,KS) are easily transferable to other organisations	80	20	64	36	N/A	N/A	88	12
20. Due staff shortages I spend considerably more of my time performing unskilled jobs which takes me away from more pressing duties	54	46	77	23	88	12	82	18

21. I am able to make a contribution to any organisational change within (NHQ,SRG,C3ID,KS)	40	60	67	33	N/A	N/A	55	45
22. I am comfortable in expressing my views about organisational changes in (NHQ,SRG,C3ID,KS)	72	28	82	18	81	19	85	15
23. Staff meetings/Briefs give me an opportunity to be involved in decision making	72	28	75	25	64	36	73	27
24. I obtain useful information at my Directorate/Squadron meetings	88	12	100	0	N/A	N/A	71	29
25. I obtain useful information at Branch/Wing meetings	80	20	80	20	65	35	66	34
26. Upon my employment at (NHQ,SRG,C3ID,KS) I received an adequate briefing regarding my duties	51	49	64	36	33	67	55	45
27. Job Induction for new staff is well managed at (NHQ,SRG,C3ID,KS)	46	54	50	50	12	88	44	56
28. I am familiar with records management processes at (NHQ,SRG,C3ID,KS)	41	59	56	44	56	44	31	69
29. I can easily obtain the necessary information required for day-to-day decision making	65	35	43	57	55	45	54	46
30. Electronic records are more easily accessible than records	61	39	27	73	76	24	80	20
31. Current physical organisation of work stations promotes team work	41	59	33	67	22	78	39	61
32. I work effectively in an open plan environment	45	55	33	67	29	71	30	70
33. My work environment is too noisy	59	41	42	58	86	14	69	31
34. The work I do contributes to the overall goals of (NHQ,SRG,C3ID,KS)	90	10	100	0	100	0	96	4
35. I feel free to ask work-related questions of my immediate supervisors without fear of being judged	87	13	93	7	96	4	95	5
36. The team I am a part of is supportive of team members	90	10	100	0	N/A	N/A	93	7
37. Teamwork is the aspect of work I value most	77	23	69	31	N/A	N/A	78	22
38. I get most of my work related information through informal channels (chatting with colleagues either in person or over the phone, informal emails, etc)	62	38	78	22	N/A	N/A	88	12
39. A sense of humour is a positive aspect of how my team operates	96	4	100	0	N/A	N/A	98	2
40. Mentoring of staff is a usual practice at (NHQ,SRG,C3ID,KS)	22	78	60	40	N/A	N/A	30	70
41. I am free to use my initiative in whatever way to help meet my team's objectives	90	10	92	8	N/A	N/A	89	11

42. I feel free to ask work-related questions of my team fellows without fear of being judged	96	4	92	8	N/A	N/A	100	0
43. Team cohesion is essential in achieving set goals	94	6	100	0	N/A	N/A	100	0
44. I feel free to ask work-related questions in Branch/Staff meetings without fear of being judged	87	13	92	8	N/A	N/A	87	13
45. In my team, humour is sometimes used to ridicule team members	25	75	70	30	N/A	N/A	12	88
46. In my team conflict is well managed	56	44	91	9	N/A	N/A	84	16
47. I view my service in the (Navy, Air Force, C3ID,KS) as a long term career (>15yrs+)	75	25	70	30	N/A	N/A	86	14
48. I get most of my work related information through formal means (Reports, Meetings, etc)	59	41	70	30	70	30	38	62
49. To access work related information I prefer non-technology based sources (e.g. Personal networks, etc)	26	47	12	88	N/A	N/A	24	76
50. I have enough time at work to reflect on what I am doing	48	52	27	73	N/A	N/A	31	69
51. (NHQ,SRG,C3ID,KS) provides me with adequate training to progress my career	45	55	70	30	N/A	N/A	58	42
52. I always know what is expected of me in the (NHQ,SRG,C3ID,KS) workplace	64	36	70	30	N/A	N/A	45	55
53. In my team, work related social activities lead to a greater sense of team spirit	85	15	75	25	56	44	78	22
54. My current job gives me plenty of scope for personal development	59	41	75	25	N/A	N/A	75	25
55. My current work contributes to my long-term career ambitions	62	38	69	31	N/A	N/A	75	25
56. I feel I can discuss my long-term career ambitions with my superiors	71	29	90	10	N/A	N/A	79	21
57. I trust the decisions made by (NHQ,SRG,C3ID,KS) leaders	53	47	90	10	N/A	N/A	71	29
58. My team works together effectively	91	9	100	0	N/A	N/A	95	5
59. I have a clear understanding of (Navy, Air Force and Army) values	90	10	91	9	N/A	N/A	69	31
60. I feel free to discuss my thoughts and opinions on work related issues with team members	94	6	100	0	N/A	N/A	97	3
61. I can easily discuss work related grievances with my superiors	80	20	85	15	N/A	N/A	78	22
62. In my team, good leadership enhances effective teamwork	83	17	100	0	N/A	N/A	91	9
63. (NHQ,SRG,C3ID,KS) upholds my service values more strongly than other places I've been posted to	39	61	60	40	N/A	N/A	54	46

64. I view my career in the (Navy, Army, and Air Force) as a short-term (5 yrs or less)	9	91	18	82	N/A	N/A	21	79
65. At (NHQ,SRG,C3ID,KS) there are good mechanisms in place for dealing with workplace conflict	51	49	67	33	N/A	N/A	39	61
66. On a day-to-day basis I can adequately meet my work priorities	66	34	55	45	N/A	N/A	65	35
67. My supervisors communicate their expectations of my day-to-day work requirements well	58	42	82	18	N/A	N/A	47	53
68. My supervisor always acknowledges my positive contributions at work	62	38	75	25	N/A	N/A	76	24
69. When I first came to this posting it only took a few weeks before I had a good grasp of how the team did things	59	41	64	36	N/A	N/A	40	60
70. My previous postings have provided me with most of the knowledge I need to do my job here	56	44	77	23	N/A	N/A	56	44
71. I view my service in the (Navy, Army or Air Force) as a good medium term career (6-15 yrs)	32	68	40	60	N/A	N/A	33	67
72. When I'm not sure how to do my work, I feel comfortable about asking others for help	92	7	85	15	N/A	N/A	95	5
73. My previous postings have provided me with most of the experience I need to do my job here	66	34	67	33	N/A	N/A	73	27
74. When I don't know how to do a particular aspect of my work I feel I need to hide my lack of knowledge	7	93	0	100	N/A	N/A	10	90
75. In my work environment we are encouraged to collaborate rather than complete with one another	94	6	100	0	N/A	N/A	92	8
76. The culture of my work-team is such that we help each other to finish work	83	17	100	0	N/A	N/A	90	10
77. My supervisor rarely acknowledges my positive contributions at work	23	77	0	100	N/A	N/A	19	81
78. I feel in my work environment I can positively learn from the mistakes I make	92	8	100	0	N/A	N/A	94	6
79. It is easy to find out what is going on at (NHQ,SRG,C3ID,KS) (There are few secrets around here)	42	58	67	33	N/A	N/A	38	62
80. Whenever I make good suggestions my supervisor stands by me	92	8	91	9	N/A	N/A	92	8
81. When I send messages to senior management I get a prompt response	57	43	83	17	N/A	N/A	75	25
82. The general spirit at (NHQ,SRG,C3ID,KS) is "We are all in this together and we sink or swim together"	46	54	82	18	N/A	N/A	54	46

83. When I see a crisis building up I find it easy to alert my supervisor(s) about it	94	6	73	27	N/A	N/A	97	3
84. Once I alert my supervisor(s) about a crisis they act upon it	82	18	56	44	N/A	N/A	82	18
85. When I send messages to senior management I get an honest response	70	30	82	18	N/A	N/A	83	17
86. I feel that my directors are sincerely interested in my welfare	67	33	91	9	N/A	N/A	74	26
87. I happily share my knowledge and/or expertise with all members within my team	99	1	100	0	N/A	N/A	98	2
88. I find it relatively easy to get feedback from my supervisors when I ask for information	82	18	92	8	N/A	N/A	90	10
89. I feel that my directors are sincerely interested in my career advancement	63	37	90	10	N/A	N/A	59	41
90. I happily share my knowledge and/or expertise with other members within my directorate	99	1	100	0	N/A	N/A	100	0
91. I usually get due recognition from other team members for the work I do	86	14	100	0	N/A	N/A	88	12
92. The results of my work are dependent on efforts of people within my team	72	28	100	0	N/A	N/A	80	20
93. I happily share my knowledge and/or expertise with people outside (NHQ,SRG,C3ID,KS)	97	3	100	0	N/A	N/A	90	10
94. The exchange of information that takes place in my work area is efficient	N/A	N/A	N/A	N/A	39	61	74	26
95. I consider the current reorganization of the ADO as contributing to more effective work outcomes	N/A	N/A	N/A	N/A	40	60	27	73
96. Organisational change in the ADO involved a convulsive process at all levels	N/A	N/A	N/A	N/A	17	83	17	83
97. Budget cuts adversely affect my ability to do my work	N/A	N/A	N/A	N/A	63	37	69	31
98. People who work on the same task/project should be located in close proximity	N/A	N/A	N/A	N/A	93	7	93	7
99. In this area, Operational Skills are overvalued	N/A	N/A	N/A	N/A	12	88	36	64
100. I have a clear understanding of ADO values	N/A	N/A	N/A	N/A	100	0	77	23

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Appendix C

External ESLA Publications

Agostino, K. (1998). "The Making of Warriors: Men, Identity and Military Culture." IIGS: Australian Masculinities 3(2).

Agostino, K. (1998). "She's a good hand: Women's Strategies in Masculinist Work Spheres." Journal of Interdisciplinary Gender Studies 3(1): 1-23.

Agostino, K., R. Gori, et al. (1999). The Enterprise Social Learning Architectures Task: Context and Conclusions from the Pilot Study. Canberra, DSTO.

Agostino, K., C. Pascoe, et al. (2000). "Aspects of Collaborative Social Learning in the Australian Defence Force", International Workshop on Advanced Learning Technologies, Palmerston NZ, 4 - 6 December, 2000, the proceedings of IWALT2000 Advanced learning Technology: design and development issues. International Workshop on Advanced Learning Technologies, Palmerston NZ, 4 - 6 December, IEEE Computer Society.

Ali, I., C. Pascoe, et al. (2002). "Interactions of Organisational Culture and Collaboration in Working and Learning." Educational Technology and Society 5(2): 60-69.

Ali, I., C. Pascoe, et al. (2002). Yet Another Role for Team Building and Work Motivation-Enabler of Knowledge Creation and Knowledge Sharing. Proceedings of Command & Control Research & Technology Symposium., Monterey, CA, U.S. Dept of Defence.

Ali, I., C. Pascoe, et al. (2000). Enabling Learning: A Progress Report on the Enterprise Social Learning Architecture Task. 5th International Command and Control Research and Technology Symposium, Canberra, Australia.

Ali, I., L. Warne, et al. (2001). The Impact of Organisational Culture, Information Sharing and Collaboration on Organisational Learning: Reflections from the Study by the Enterprise Social Learning Architectures Team. Canberra, ACT, DSTO.

Ali, I., L. Warne, et al. (2001). Working and Learning Together: Social Learning in the Australian Defence Organisation. Informing Science Conference IS2001-Bridging Diverse Disciplines Proceedings (CD-ROM), Krakow, Karkow Uni of Economics, Poland, June 19-22, 2001, ISSN 1535-0703.

Ali, I., L. Warne, et al. (2000). A Socio-Technical Approach to Social Learning In Organizations: A Study Of Two Settings In The Australian Defence Organisation: Research

In Progress. Proceedings of the Americas Conference on Information Systems., Long Beach, California, [CD-ROM] Omnipress for the Association for Information Systems.

Linger, H. (1999). Utilising Knowledge Resources: An Activity Perspective of Knowledge Management.

Linger, H., F. Burstein, et al. (1998). "Conceptual Development of an Information Systems Framework for Improving Continuity in Epidemiological Research." European Journal of Epidemiology 14: 587-593.

Linger, H. and L. Warne (2001). "Making the Invisible visible: Modeling social learning in a knowledge management context." Australian Journal of Information Systems Special Issue on Knowledge Management (December): pp 56-66.

Pascoe, C., I. Ali, et al. (2002). Yet another Role for Team Building and Work Motivation: Enabler for Knowledge Creation and Knowledge Sharing. The Information Science and IT Education Conference, Cork, Ireland, University of Cork.

Pascoe, C., I. M. Ali, et al. (2002). Collaborative Knowledge Development, Dialogue, and Team Building: Findings from Research into Social Learning in the Australian Defence Organisation. Canberra, DSTO.

Rigter, W. J., E. Kruzins, et al. (2000). Krait 00/1 War Game (ISR and Force Protection). RAAF Williamstown, Joint Systems Branch, DSTO, Electronics and Surveillance Research Laboratory.

Warne, L. (1999). Social Learning and SRG: A Community of Practice Perspective., DSTO.

Warne, L. (1999). A Sociotechnical Approach to Social Learning Analysis in the Australian Defence Force. The New Sociotech: Graffiti on the Long Wall. E. Coakes, R. Lloyd-Jones and D. Willis. London., Springer-Verlag for the British Computer Society.

Warne, L. (2000). "Understanding Organisational Learning in Military Headquarters: Findings From a Pilot Study." Australian Journal of Information Systems 7(2): 127-142.

Warne, L. (2001). "Knowledge Management and Social Learning" in Knowledge Management for Information Communities: Proceedings of the Australian Conference of Knowledge Management and Intelligent Decision Support. Australian Conference of Knowledge Management and Intelligent Decision Support., Melbourne.

Warne, L., K. Agostino, et al. (1999). C3ID Social Learning Pilot Study: Final Report (ESLA): Task Report. Canberra, DSTO.

Warne, L., K. Agostino, et al. (2000). C4ISREW Social Learning Study: Final Report. Enterprise Social Learning Architectures (ESLA): Task Report. Canberra, DSTO.

Warne, L. and I. Ali (2000). Report C4ISREW. Canberra ACT, DSTO.

Warne, L. and I. Ali (2001). Systems Thinking-The Power behind Social Learning: Reflection on Research in the Australian Defence Organisation. In the Relevance of Systems Thinking in the Contemporary World. Proceedings of the Systems in Management 7th Annual ANZYS Conference, Perth, Western Australia 27-28 November 2001.

Warne, L., I. Ali, et al. (2001). NHQ Social Learning Study: Interim Report, Enterprise Social Learning Architectures (ESLA): Task Report. Canberra, DSTO.

Warne, L., I. Ali, et al. (2002). Representing the Socio-Cultural Enablers of Knowledge Management and Learning in Organisations: Architectural and Definitional Models. HICSS 36, DSTO.

Warne, L., I. Ali, et al. (2002). Socio-Technical Foundations for Knowledge Management. Canberra, ACT, DSTO.

Warne, L., I. Ali, et al. (2001). "A Holistic Approach to Knowledge Management and Social Learning: Lessons Learnt from Military Headquarters." Australian Journal of Information Systems. Special Issue on Knowledge Management. (December): pp 127-142.

Warne, L., I. Ali, et al. (2001). Navy Headquarters Social Learning Study: Final Report, Enterprise Social Learning Architectures (ESLA): Task Report. Canberra, DSTO.

Warne, L., C. Pascoe, et al. (2002). "Knowledge Management Chapter." Journal of Information and Knowledge Management. Special Issue (Special Issue).

Warne, L., C. Pascoe, et al. (2000). Social Learning and Knowledge Management in the Australian Defence Organisation. Proceedings of the International Conference of Systems Thinking in Management, Geelong, Deakin University.

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DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION DOCUMENT CONTROL DATA				1. PRIVACY MARKING/CAVEAT (OF DOCUMENT)	
2. TITLE Social Learning and Knowledge Management - A Journey through the Australian Defence Organisation: The Final Report of the Enterprise Social Learning Architectures Task			3. SECURITY CLASSIFICATION (FOR UNCLASSIFIED REPORTS THAT ARE LIMITED RELEASE USE (L) NEXT TO DOCUMENT CLASSIFICATION) Document (U) Title (U) Abstract (U)		
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6a. DSTO NUMBER DSTO-RR-0257		6b. AR NUMBER AR-012-854		7. DOCUMENT DATE August 2003	
8. FILE NUMBER 29505-23-212		9. TASK NUMBER JWF 98/004		10. TASK SPONSOR Tim McKenna FASSP	
11. NO. OF PAGES 68		12. NO. OF REFERENCES 47			
13. URL on the World Wide http://www.dsto.defence.gov.au/corporate/reports/DSTO-RR-0257 .pdf			14. RELEASE AUTHORITY Chief, Defence Systems Analysis Division		
15. SECONDARY RELEASE STATEMENT OF THIS DOCUMENT <i>Approved for public release</i>					
OVERSEAS ENQUIRIES OUTSIDE STATED LIMITATIONS SHOULD BE REFERRED THROUGH DOCUMENT EXCHANGE, PO BOX 1500, EDINBURGH, SA 5111					
16. DELIBERATE ANNOUNCEMENT No Limitations					
17. CITATION IN OTHER DOCUMENTS Yes					
18. DEFTEST DESCRIPTORS Learning transfer Learning Social organization Social communication Australian Defence Force					
19. ABSTRACT The research methods, research findings and outcomes of the Enterprise Social Learning Architectures (ESLA) task (JWF 98/004) are reported on in this document. Social learning is defined as learning occurring within or by a group, an organisation, or any cultural cluster and includes the procedures by which knowledge and practice are transmitted across posting cycles, across different work situations and across time. The term 'social' learning reflects that organisations, organisational units, and work groups are social clusters and that learning occurs in a social context. Knowledge management is tightly coupled to social learning. Study results from three ADO settings are discussed: 82Wing Headquarters at the Strike Reconnaissance Group (SRG) at Amberley Air Base in Queensland; the then C4ISREW Division at ADHQ; and finally,					

Navy Headquarters (NHQ) in Canberra.

Organisational and cultural factors that positively contribute to social learning and to the retention of corporate knowledge within the organisations studied are identified with a focus on the elements of workplace culture that foster human interactions conducive to generative learning. The research findings discussed lead to the development of social learning architectures. Architectural depictions of social learning and knowledge management are presented as a representation of factors impacting on social learning and also in terms of a Toolset of actions, processes and strategies.

The prime methodology used was ethnographic (observational fieldwork). Extensive semi-structured interviews were also undertaken with a sample of staff, and a quantitative survey questionnaire was used to support and validate qualitative data, and to facilitate comparison across the three settings.

The findings indicate that social learning is facilitated by a three-tiered collection of elements: Overarching organisational values; Learning capability - environmental characteristics, both internal and external to the organisation; and Enablers - processes and strategies that, if present and effectively applied, can facilitate social learning. These are conceptualised as a Learning Toolset that an organisation can use to facilitate its activities in pursuit of required organisational outcomes.

Over 40 of these enabling processes and strategies are identified, and assigned to three categories: Force Structure - including issues like staff recruitment, retention, conditions of service and general morale issues; Preparedness - which, in terms of social learning and Knowledge Management, requires the two social learning constructs of Team Building, and Professional Development; and Capability - including information and knowledge management processes for helping retain the knowledge of valued and skilled personnel, facilitating social learning, and extending the skills and experience set of current personnel.

The report gives a sample of recommendations made to the commanders of the settings studied, and outlines the research teams 'lessons learnt' as derived from a Task Learning History exercise.