

**THE UNIVERSITY OF HULL**

**An Empirical Investigation of the Nature of Management  
Development with Particular Emphasis on the Influence of Learning  
Styles on the Levels of Accumulated Managerial Tacit Knowledge in  
the Malaysian Public Service**

**being a Thesis submitted for the degree of  
Doctor of Philosophy**

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**By**

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## **Abstract**

This study explored the broad learning patterns associated with the acquisition of managerial tacit knowledge. The study then proceeded to examine whether levels of accumulated managerial tacit knowledge (LAMTK) may be associated with managers' learning styles and/or the extent to which a person's style is consonant with the context of their work environment. The possibility that deliberate learning strategies normally associated with formal rather than informal learning would be unrelated to LAMTK was also examined.

The research employed a cross-sectional, mixed-method approach incorporating both qualitative interview and survey data collection. For the qualitative element, interviews were conducted with 14 public sector managers based on a method developed by Nestor-Baker (1999). For the quantitative element, survey data were collected from 356 public sector managers attending management development training courses at the Malaysian National Institute of Public Administration. Respondents completed a questionnaire designed to measure tacit knowledge based on Sternberg et al's (2000) Tacit Knowledge Inventory for Managers, learning styles based on Geiger et al's (1993) normative version of Kolb's Learning Style Inventory, learning strategy based on Warr & Downing's (2000) Learning Strategies Questionnaire, and a range of other self developed items.

The interviews revealed that most managers were unaware of the learning associated with the acquisition of tacit knowledge, as it occurs in an unplanned and unintentional manner. Several adult learning principles such as reflection and learning from experience emerged from the analyses. While learning styles were found to be significant in predicting LAMTK, a rather surprising finding was that learning strategies, believed to be associated with declarative as opposed to tacit knowledge, were also related to LAMTK. Based on these findings it was concluded that the process of tacit knowledge acquisition involves the interaction of learning that takes place in both formal and informal settings. Outcomes of the research suggest that in management development initiatives, formal approaches should be blended with informal approaches in order to achieve effective learning.

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## Abbreviations

AC	Abstract Conceptualization
ACA	Anti-Corruption Agency
ADF	Asymptotically distribution free methods
ADS	Administrative and Diplomatic Service
AE	Active Experimentation
AGFI	Adjusted goodness-of-fit
AMOS	Analysis of Moments Structure
ANCOVA	Analysis of Covariance
BOO	Build-Own-Operate
BOT	Build-Operate-Transfer
CE	Concrete Experience
CFA	Confirmatory factor analysis
CFI	Comparative Fit Index
DAU	Development Administration Unit
ELT	Experiential Learning Theory
EPU	Economic Planning Unit
ERTI	Executive Roundtable-INTAN
FDI	Foreign Direct Investment
FIRO-B	Fundamental Interpersonal Relations Orientation-Behavior
GAS	General Administrative Service
GFI	Goodness-of-Fit Index
HRMIS	Human Resource Management Information System
IADLs	Instrumental Activities of Daily Living
ICA	Industrialization Coordination Act
ICDAU	Implementation, Coordination and Development Administration Unit
ICT	Information and Communication Technology
ICU	Implementation Coordination Unit
IFI	Incremental fit index
IMF	International Monetary Fund
IMP	Industrial Master Plan

INTAN	National Institute of Public Administration
IQ	Intelligence Quotient
KMO	Kaiser-Meyer-Olkin test
KS	Kolmogorov-Smirnov
LAMTK	Levels of Accumulated Managerial Tacit Knowledge
LSI	Learning Styles Inventory
LSQ	Learning Strategies Questionnaire
MAMPU	Malaysian Administrative Modernization and Management Planning Unit
MAS	Malay Administrative Service
MCI	Management Charter Initiative
MCS	Malayan Civil Service
MCSL	Malaysian Civil Service Link
MHFS	Malaysian Home and Foreign Service
MIDA	Malaysian Industrial Development Authority
ML	Maximum Likelihood
MRS	Malaysia Remuneration System
MSC	Multimedia Super Corridor
MTR	Mid-term review
NDP	National Development Policy
NEAC	National Economic Action Council
NEP	New Economic Policy
NERP	National Economic Recovery Plan
NICs	Newly Industrializing Countries
NNFI	Non-normed fit index
NPM	New Public Management
NRS	New Remuneration System
NVP	National Vision Policy
OPP	Outline Perspective Plan
PANEL	Panel on Administrative Improvements to the Civil Service
PF	Principal Factors

PMD	Prime Minister's Department
PSC	Public Service Commission
PSD	Public Services Department
RED	Rural Economic Development
RMSEA	Root mean square error of approximation
RO	Reflective Observation
SDL	Self-directed learning
SEM	Structural Equation Modelling
SJT	Situational Judgment Tests
SPSS	Statistical Package for the Social Sciences
TKIM	Tacit Knowledge Inventory for Managers
WAIS	Wechsler Adult Intelligence Scale
WISC	Wechsler Intelligence Scale for Children

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction: The Problems Outlined

At the onset of the Information Age, a more integrated global economy, and greater liberalization of the markets, Malaysia's competitive advantage should no longer be dependent on factors such as labour, land and natural resources, but on its potential to produce, acquire, utilize and disseminate knowledge. With Malaysia's low-cost competitive advantage being eroded by lower-cost countries, the need to push into higher value added economic activities where technology and productivity are the main drivers forced Malaysia to transform itself into a Knowledge-Based Economy<sup>1</sup> (Nazrin, 2002). The availability of knowledge would hasten Malaysia's pace to join the league of high value-added producing nations (Le and Koh, 2002). This is one of the most important aspects of the nation's development strategy at this time.

The Knowledge-based Economy Masterplan released by the Government of Malaysia in 2001 provides the blueprint for the latest phase in the transformational trajectory of the Malaysian economy from a production-based economy to an economy based on knowledge (Malek Shah, 2003). Prominent within the Masterplan is the development of public personnel based on the competency model. The adoption of the competency model reflects the prevailing route in education and development of Malaysian public service, which shows heavy reliance on formal as

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<sup>1</sup> Knowledge economy refers to the overall economic structure that is emerging from two defining forces: the rise in knowledge intensity of economic activities, and the increasing globalisation of economic affairs (Houghton and Sheehan, 2000). In a knowledge economy, the generation and exploitation of knowledge play the predominant part in the creation of wealth (United Kingdom Department of Trade and Industry, 1998).

opposed to informal learning. It also reflects the predominant emphasis in management development practice on institutionalised training, formalized forms of learning and focus on specific competencies.

Recently, however, criticisms have been levelled against the formal learning environments prevalent in most institutional settings and it has been suggested that most of what managers actually learn is derived from their own experience 'on the job'. Significant emphasis has therefore been attached to the importance of helping managers to see knowledge as a social phenomenon. Emergent theories include the theory of 'Situated Learning' (Lave and Wenger, 1991), which emphasizes the interaction between individual learning, practice and every-day work tasks, and the theory of Communities of Practice (Brown and Duguid, 1991; Wenger, 1999) which focuses on social relationships around the learner.

The two learning environments of formal and informal learning are associated with two forms of knowledge, explicit and tacit knowledge. Several authors have argued that tacit knowledge is an important factor that distinguishes successful managers from others (Wenger et al., 2002). The content and level of tacit knowledge has also been found to differ between the typical and the more successful managers (Wagner and Sternberg, 1987). Tacit knowledge is often regarded as a product of learning from experience that affects performance in real-world settings (Nonaka and Takeuchi, 1995; Sternberg and Wagner, 1986). This would position the explicit versus tacit knowledge issue within the broader debate on informal versus formal learning mentioned earlier. If tacit knowledge is acquired by learning from experience, then it is possible that a range of individual differences such as

intelligence, personality, prior knowledge, and other psychological constructs such as stylistic preferences for different ways of learning from experience will have a significant impact on the knowledge acquisition process. No research has so far explored the relationship between any of these individual differences and the content or level of managerial tacit knowledge. The present research is an attempt to fill this gap.

Sternberg's model of knowledge acquisition, which will be discussed further in Chapter 3, suggests that learning styles are an important factor in informal learning environments. It follows, therefore, that if tacit knowledge is acquired in informal on the job settings, then a person's learning style may be one factor that explains the differences in the levels of accumulated tacit knowledge acquired by various managers. The length of people's experience may also explain differences in levels of accumulated managerial tacit knowledge (LAMTK). These are two of the major research questions that this study seeks to address. If such relationships exist, then one consequence for the field of management development would be that management development providers would need to reassess their roles from being providers of skills and theory, to being facilitators in the acquisition of relevant tacit knowledge in an informal context. Furthermore, if it is true that managers can only acquire tacit knowledge on the job, a training institution's role within this context would be limited to equipping the respective managers with the tools to facilitate the acquisition of such knowledge. Among these may be the need to enhance managers' understanding of their own learning styles and increase their appreciation of other stylistic options and differences available.

Another problem within organizations is that managerial capability has always been viewed as an asset for consideration in promotions to more senior positions. Following the above argument on the importance of tacit knowledge to successful managers, managerial tacit knowledge would obviously be a main ingredient in this capability. However, these senior leadership positions are contested not just by practising managers, but also by those in other professional groups such as engineers or accountants. No research has been done so far to see if those that have mostly performed managerial duties have a higher level of managerial tacit knowledge than those who have significant work experience but in other professional contexts that are not necessarily managerial. This forms another major part of the present study.

The Malaysian public service provides an excellent setting to conduct this study. Malaysia had the world's tenth-fastest growing economy from 1970 to 1990. What makes this "exceptional" is that Malaysia is an ethnically heterogeneous country, and evidence shows that as a group, ethnically heterogeneous countries are far poorer than ethnically homogeneous countries (Snodgrass, 1995)<sup>2</sup>. Furthermore, in Malaysia, ethnicity and economic function have been shown to correlate with each other (Kuhonta, 2002)<sup>3</sup>.

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<sup>2</sup> This gives an indication of the difficulty in administering such a diverse country, let alone progressing economically, as the following quote by Lande (1999) suggests "Malaysia (and Singapore) inherit from their colonial past internal ethnic divisions left by the heavy recent immigration of non-natives. All of these peninsular states now face, in varying forms, the challenge of creating a new sense of nationhood among their previously separated peoples" (p.110).

<sup>3</sup> Such association between ethnic groups and economic factors such as income and employment does not exist in other pluralistic nations such as India and Nigeria.

As in any public service, the main task of the Malaysian public service is to implement successfully all of the ruling government's policies and projects. However, the Malaysian government's programmes have been claimed to be more ambitious and grandiose (Ghosh, 2003; Konstadakopulos, 2002) than in most other developing nations and Malaysia has been relentless in its quest for economic growth. Such policies were critical not merely for sustenance but for the survival of the nation and were pursued within the context of a struggle closely associated to its past colonial experience (Milner, 2003). This struggle was compounded by the complex chemistry of the nation's multi-ethnic society, both in the peninsula and in the two East Malaysian states.

Despite all the measures taken by the Malaysian government, a solution to the tensions prevalent among its major ethnic groups is remote (Yeoh, 1999). This remains the single biggest threat to the nation's stability and existence. However, the hallmark of the state's previous successes in maintaining harmony among the plural society lies in its effective government machinery (Kuhonta, 2002). It has successfully implemented policies oriented towards economic growth and developmental equity between the various races (Verry and Lucas, 1999). While a permanent solution to this fundamental problem is being sought, it is also necessary to maintain the public service's efficiency as well as to prepare it to face new challenges.

The remainder of this chapter will present the background and context of the present research by first presenting the background on Malaysia. Ethnicity is the most potent force in Malaysia (Hock Guan, 2000) and these factors need to be understood in

order better to understand Malaysia, especially since many of the government workings and policies are laced with ethnic considerations (Crouch, 2001). This chapter will then continue with a brief description of the Malaysian government machinery, its public service and a discussion of the Malaysian Diplomatic and Administrative Service, the core group within the Malaysian public service that is responsible for most managerial and senior positions within the government machinery.

One of the chapter's aims is to map the transition that the Malaysian public service managers went through during the nation's pursuit of socio-economic development. The transition will be explored through three socio-economic development phases: the New Economic Policy (1970-90), the National Development Policy (1991-2000), and the current National Vision Policy (2001-10) (Commonwealth Secretariat, 2004). This will provide a useful preamble to the next chapter, which will discuss the administrative reform measures and management development efforts that have been put in place for Malaysian public service managers.

## **1.2 Research Questions**

Research questions, according to Punch (1998), can serve several purposes. They can delineate the boundaries of a research, thereby ensuring a focus for the research, and can keep the researcher focused towards the original aim of the research, especially when met by unforeseen problems. Furthermore, research questions help the researcher organize the research in terms of maintaining coherence. Research questions also can be the basis for the writing up of the research report and finally they can help the researcher determine the data needed for the research.

Based on the arguments presented so far, this research was guided by the following broad research questions:

- How do managers “learn” and how do they acquire managerial tacit knowledge?
- What is the role of informal learning in the acquisition of managerial tacit knowledge?
- Is there a relationship between learning styles and managerial tacit knowledge?
- Do general experience, and experience within a managerial context contribute in different ways to the acquisition of managerial tacit knowledge?
- What relationship exists between the different learning abilities and the levels of managerial tacit knowledge?

### **1.3 Research Objectives**

This study explores the possibility that the level of acquired managerial tacit knowledge may be influenced by managers’ learning styles and the extent to which their styles are consonant with the context of their work environment. The study also considers how the extent to which practising managers engage in genuine managerial activity impacts on the acquisition of tacit knowledge.

In light of the problems outlined above, the objectives of the present research are as follows:

- i. To investigate learning patterns associated with the accumulation of managerial tacit knowledge

- ii. To enhance understanding of the relationship between styles of learning from experience among managers in the public sector and variation in levels of tacit knowledge, especially those related to a management context.
- iii. To examine the relative contributions of formal and informal learning environments to differences in levels of managerial tacit knowledge.
- iv. To examine the influence of the work context on the accumulation of managerial tacit knowledge.

#### **1.4 Malaysia: Location and Social Make-up**

Malaysia is located in Southeast Asia. It is made up of East and West Malaysia<sup>4</sup>. East Malaysia consists of two states, Sabah and Sarawak located on the island of Borneo. West Malaysia, on the other hand, is made of eleven states: Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Pahang, Penang, Perak, Perlis, Selangor, and Terengganu. Kuala Lumpur, the island of Labuan and Putrajaya, the new administration centre for Malaysia, are separate federal territories. The population was estimated at 23 million people in the year 2000 (Government of Malaysia, 2001a). However, 80% of the population lives in Peninsular Malaysia.

#### **1.5 The Malaysian Public Sector and the National Development Agenda**

One monumental task for the government of Malaysia was to integrate the three major ethnic groups: the Malays, Chinese and Indians, who have almost nothing in common, in language, culture, or religion.



Imbalances in the distribution of income and wealth were identified as the major contributor to the racial sentiment culminating into the 13 May 1969 rioting incident<sup>5</sup> (Ahmad et al., 2001). The introduction of the New Economic Policy (NEP) was a direct consequence of this incident and it has been the main reference point for most development policies in the country ever since. Appendix A presents a detailed discussion of the NEP.

The NEP was mostly credited for its economic achievements. It reduced poverty from 49.3% in 1970 to 16% in 1990. Between 1971 and 1987, a total of 775,138 hectares of land were opened, accommodating 92,000 people. Export increased from 12% in 1970 to 60% in 1990. The manufacturing sector also increased from 29% in 1970 to 41.6% in 1988. Trade increased from 36.7% in 1970 to 75.4% in 1988. Corporate ownership by Malaysians increased from 36.7% in 1970 to 75.4% in 1988. This high rate of economic growth was believed to be a major factor in quelling the tensions among the major ethnic groups<sup>6</sup> (Ahmad et al., 2001). However, there are opposing arguments that it is not growth per se that is responsible for what Malaysia has achieved in the past, but more likely an “active public sector” (Kuhonta, 2002, p.35). This active role played by the public service in the nation’s economy is

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<sup>4</sup> The names East and West Malaysia ceased to be used in 1972 in an attempt to blur the differences between the two regions. West Malaysia was renamed Peninsular Malaysia and the East Malaysian states called Sarawak and Sabah.

<sup>5</sup> The issue of Malay special rights and immigrant citizenship was a major source of contention amongst the various ethnic groups for many years before and after the independence period. In the general elections of 1959, 1964 and 1969 both issues were consistently brought up, especially among the opposition parties. By the 1969 general elections, the hatred against each other, sowed throughout the years, was too hard to contain. Added to the outcome of the elections, which seemed to threaten the continued pre-eminence of the ruling party, inter ethnic rioting exploded on 13 May 1969 and persisted for several days until order was restored by the army units (Lande, 1999).

<sup>6</sup> Lande (1999) painted a similar scenario for Singapore when he said that the success of Singapore's attempt to create a new nation state with a distinctive multi-ethnic identity but united as well would “depend upon the continued growth of Singapore's impressive economy. A serious and prolonged economic down-turn could open serious fissures in the island state” (p.113).

evidenced from the strong interventionist approach adopted by the government (Boo Teck, 2000) to ensure the success of the NEP.

### **1.5.1 The Public Service**

Politicians and bureaucrats make up the staff of a Ministry. Politicians lead a Ministry by holding the positions of Minister, Deputy Minister(s), and parliamentary secretaries. The structure of the public service has as the highest public servant the Chief Secretary to the government who leads the Civil Service. The Secretary-Generals, on the other hand, are the top civil servants at the Ministries and for the most part are professionals from the Administrative and Diplomatic Service (ADS). Under the purview of each Ministry are Departments headed by Director-Generals from various services, such as the Medical and Health Officers Service in the case of the Health Ministry and the Education Officers Service in the case of the Education Ministry (Economic Planning Unit, 2004).

Federal public service institutions made up of central agencies, ministries, departments and statutory authorities play a leading role in the administration of the nation. Central agencies include the Treasury, Economic Planning Unit (EPU), Malaysian Administrative Modernization and Management Planning Unit (MAMPU), Implementation Coordination Unit (ICU) and the Public Services Department (PSD). All central agencies with the exception of the Treasury are under the Prime Minister's Department (PMD). The Treasury and EPU are authorized to consider and approve requests for projects and funds from relevant Ministries. MAMPU is concerned with improving work processes and procedures in all government entities. It has the task of introducing management improvements in the

public sector. It focuses much of its attention on developing and implementing information and communications technology and office automation. Public sector personnel management are centralized at the Public Services Department, also located in the Prime Minister's Department. It exercises control over all government establishments such as their organisational structures, recruitment and promotion policies, and training and staff development. Finally, the ICU monitors and coordinates all developmental policy implementation (United Nations, 2003).

The Malaysian public service is a "career service" (Puthucheary, 1978). Entry is at lower levels, and the skills necessary for higher-level work are developed from within the service. Recruitment to different levels is determined according to educational qualifications at entry. Progress within the service is through annual salary increments and promotion to higher ranks relies heavily on seniority. It is claimed that the system makes the public service very resilient and insulated<sup>7</sup> (Painter, 2004).

The Malaysian public sector is made up of nineteen types of service classifications including medical, education, police and military. Most of these services are specific to a particular profession, such as engineering or medical. However, a special service exists to perform management and administrative functions within the Malaysian Public Sector at all levels. This group, which dominates most managerial functions, is the Administrative and Diplomatic Service (ADS).

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<sup>7</sup> This nature of the public service has also attracted negative comments. The public service was said to be highly resistant to change, despite efforts made to reform it (Sri Tharan, 2001) and it is difficult to introduce newer measures that can help enhance performance and efficiency such as lateral recruitment, performance or merit pay, and contract employment into the service (RIAP, 2001).

### 1.5.2 The Administrative and Diplomatic Service

The emergence of Malaysia as a nation has been dependent on its public service and its efficiency and capability have been the cornerstone of Malaysia's development (Sri Tharan, 2001). Most of the government's policy, geared to develop the nation towards prosperity and harmony for its plural society, has been entrusted to the Malaysian public service. Ever since achieving independence, the government has focused its efforts toward development of its poor, rural population. An extensive network of state machinery was established to implement the government's ambitious policies and projects. Throughout the entire public service from the federal down to the district level, a special group of civil servants within the so-called Administrative and Diplomatic Service was entrusted with the responsibility of most managerial work.

The Administrative and Diplomatic Service was created under Article 132 of the Federal Constitution and it was classified as *the general public service of the Federation*. Formerly known as the Malayan Civil Service (MCS), it was first established by the British administration in 1904 (Allen, 1970). Six years later in 1910 the Malay Administrative Service (MAS), a junior administrative service under the tutelage of the British colonial administration was established (Chien, 1984). Later, MAS turned into a feeder service for MCS as the first batch of thirty MAS officers was absorbed into the MCS in 1946. Non-Malays began to be admitted into the MCS from 1953.

In 1966, the original MCS was renamed the Malaysian Home and Foreign Service (MHFS) following its merger with the newly formed External Affairs Service (Elyas,

1980: 258, 274). This brought a new function of foreign affairs into the MCS. The MHFS evolved from the days of the MCS with the expansion of government activities to widen its scope and functions. With independence, it was necessary to meet the demands for the government to take a greater role in the development of the nation. A 1969 report called *Training for Development in West Malaysia* provides a general illustration on the role and function of the ADS (Government of Malaysia, 1969). The service was described as being intimately involved in every aspect of the governmental activities and development efforts. Its scope and function had become wider with expansion of government activities. The function of an MHFS officer was not routine paper work. He was now essentially a development administrator. The report further added that the role of the MHFS was to keep government operations effective at all times by maintaining administrative expertise in these operations. It was to provide leadership in the areas of decision-making, policy formulation, programme planning and review, control and management of resources, programme co-ordination and implementation.

In 1971 the MHFS was renamed the Administrative and Diplomatic Service (ADS) (Government of Malaysia, 1971). This period also marked a turning point for the public sector in general and the ADS in particular. With the ethnic riots having just passed, the public service became the main tool for the government to implement its policies. Furthermore, Tun Abdul Razak became Malaysia's second Prime Minister. His priority was to modernize the public service to enhance its efficiency and enable it to undertake greater responsibilities to compensate for the failure of market mechanism (Shaikh, 1992). A main consequence of these events was the dramatic increase of 900% in the size of the public service by 1980 (Ahmad, 1998).

Another important development involving the ADS at this time was the government's decision to merge several of its administrative services. Prior to 1974, a number of administrative services existed at the departmental and state levels. In October 1974 the government decided to merge some of these services into two main administrative services: the Administrative and Diplomatic Service (ADS) and the General Administrative Service (GAS) (Government of Malaysia, 1974). The ADS was to hold higher echelon administration and management responsibility while the GAS would be at a subordinate level to the ADS. Only the states of Kedah, Kelantan, Terengganu, Johor and the two East Malaysia states of Sabah and Sarawak were left with their own administrative services. The administrative services involved in the merger were the Malacca and Penang State Administrative Services, the Malay Administrative Service, the Immigration Department Administrative Service, the National Registration Department Administrative Service, the Election Commission Administrative Service, the Road Transport Department Administrative Service and the Labour Department Administrative Service.

To have better control over its public service, the government finally decided to merge the GAS into the ADS. The GAS at that time was the last remaining federal level administrative service outside the ADS. This merger was completed by 1991. This left the federal civil service divided into two main cadres: administrative/management under the ADS and technical/professional under various services such as engineering, medical, accountants and education (Shaari, 1980). There are also lower levels of support services that provide assistance to these two groups. The main advantage of merging the administrative services into one group is

that it offers better promotion opportunities as well as opening up transfer options for its personnel. It also gives the various Ministries/Departments more options in choosing the appropriate person to meet their needs.

## **1.6 Malaysia's Development Trajectory**

Malaysia has been touted as a development success story (Ahmad et. al., 2001). From the public service's perspective, Malaysia's socio-economic growth can generally be divided into three main phases of development policies. The 1970-1990 period was characterised by the direct role played by the government in economic activities under the influence of the New Economic Policy. In the 1991-2000 period, the government attempted to revive a market-driven economy under the National Development Policy. In the period from 2001 onwards, the government has taken steps to realise its dream of Malaysia becoming a developed state by the year 2020, as set out in the National Vision Policy. However, prevailing in all three phases was government intervention in all aspects of governance, helped by a heavily centralized, almost authoritarian political (Schroeder, 2003) and public service structure (Betancourt, 1997; Painter, 2004).

### **1.6.1 The New Economic Policy Phase (1970-1990)**

After gaining independence, the government's socio-economic policy was to achieve higher economic growth, to reduce the level of economic instability, to lower unemployment, to reduce poverty and to improve income distribution (Ahmad et al., 2001). However, reducing poverty was the government's immediate concern. Therefore, prior to 1963, Malaysia development strategy was centred towards the

rural sector where most of the poor reside<sup>8</sup>. In consequence, the nation became almost exclusively dependent on rubber and tin as its main source of income, and the economy suffered from the fluctuation in the prices of rubber in the 1960s and 1970s. The government recognised the urgent need to diversify the economy (Chien, 1984) resulting in a shift in its policy from import substitution to export orientation as advised by the World Bank.

Although successfully achieving economic growth, an increase in Gross Domestic Product and a fall in imports (Bank Negara Malaysia, 1970), the government's policies failed to reduce economic disparity among the ethnic groups in the country. The government therefore introduced the New Economic Policy (NEP) in 1970 immediately after the racial conflict of May 13, 1969. This was an important milestone for Malaysia, as most of the government's policies were subsequently guided by the NEP.

At this juncture, Malaysia managed to attract very high Foreign Direct Investment (FDI) (Jones, 1998) with electronic and textile industries leading the rush of foreign firms into the country. Exports were now concentrated on processed goods. At the beginning of the 1980s, the government began to look beyond establishing and attracting foreign manufacturing firms and started to venture into heavy industries to keep the economy growing and to continue with its redistribution agenda<sup>9</sup>.

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<sup>8</sup> The First and Second Malaya Plan (1956-60; 1961-65) as well as the First Malaysia Plan (1966-70) placed emphasis on developing the rural sector by increasing the rural population's income and tackling poverty.

<sup>9</sup> To help plan, operate and supervise heavy industrial projects the government established the Heavy Industries Corporation Malaysia or HICOM. At this point the government's involvement in economic activities went even deeper as the huge capital investment and long gestation period associated with



The world recession in the 1980s saw the Malaysian government's direct venture in economic activities taking its toll on the government's funds<sup>10</sup>. Burgeoning governing debt caused by glaring weaknesses and wastage in public enterprises could not be ignored any longer. This prompted another shift in the government development strategy. It embraced liberalization and began moving away from its traditional interventionist role to assume a more limited position. An important outcome of this new stance was the increase in privatisation of government agencies (Painter, 2004).

### **1.6.2 The National Development Policy Phase (1991-2000)**

The recession in 1984 presented Malaysia with one of its most serious crises yet. Although the recession was widely attributed to the falling prices of commodities worldwide (Siddiquee, 2002: 107), it also exposed weaknesses in the handling of the economy, as evidenced from the uncompetitiveness of Malaysian industrial exports during that period. Plans to overcome the shortcomings especially in the industrial sector were developed within the Fifth Malaysia Plan (1986 - 1990) and more specifically in the Industrial Master Plan (IMP). The IMP aimed to restructure the industrial sector while the government tried to encourage local technological research and development to reduce the nation's reliance on foreign technology<sup>11</sup>.

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heavy industries was beyond the reach of private local companies. The much-needed finance was helped with the discovery of oil reserves in the East coast of Malaysia in 1976 (Jones, 1998).

<sup>10</sup> This phenomenon of governments venturing into economic activities is not uncommon among developing states, as documented in the literature (e.g. Betancourt, 1997).

<sup>11</sup> At about the same time, the NEP reached the end of its twenty-year time frame in 1990. In political circles, concerns were raised over the future of the Malays, especially in light of statistics showing that the target of NEP had not been met (McKinnon, 1996). As a consequence, the government launched an extension to the NEP, the National Development Policy (NDP) in 1991 (Ahmad et. al., 2001). However, the NDP was much softer in its Malay-bias as compared to the NEP (Jomo and Hui,

The period from 1980 to 1990 marked a new turn for the public service. Prompted by the need to penetrate global markets and the failure of government agencies (Jones, 1998), decision makers took a second look at the government machinery and this resulted in a big shift in the public service's role. It is now the government's wish to see the private sector leading the nation's economic development. The public service was to change from being the main driver for economic development to a partner to the private sector in generating economic growth (Jabroun and Balakrishnan, 2000). Several public enterprises that dealt in business now appeared quite misplaced in the public service. Therefore, the concept of privatisation that had also swept many other nations seemed like a viable option for Malaysia (Siddiquee, 2002). A discussion on the implementation of privatisation is presented in Appendix B. The success of the government's move towards privatisation was coupled with the move to introduce the concept of Malaysia Incorporated. A discussion on the implementation of Malaysia Incorporated is presented in Appendix C.

However, one of the most formidable challenges to the government in implementing both the Malaysian Incorporated and Privatisation policies was to educate the public service (and the private sector as well) on the benefits that could be reaped through close cooperation between the two sectors (Said, 2000). While the failure of public enterprises during the NEP years could be attributed to the inability of public managers to acquire the understanding of business-related work values (Abdullah, 1994; Harris and Kumra, 2000; McGaughey et.al., 1997), the present large-scale transition from planned economy toward market culture (Koubek and Brewster, 1995) would require huge reform movement of the public service to be taken

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2003). The key strategy of the NDP was achieving *balanced development* (Government of Malaysia, 1991).

alongside “adequate development in managerial and technical capability” (Betancourt, 1997, p.9).

The planned transformation of the Malaysian economy was, however, interrupted towards the end of the decade when the 1997 Asian Financial Crisis hit the region. The financial crisis<sup>12</sup> resulted in a huge devaluation of the Malaysian currency, the Ringgit. Consuming a significant number of other Asian countries, the extent of the financial crisis was unprecedented in nature and magnitude (Ghosh, 2003). Its consequences for the Malaysian economy went beyond devaluation; it resulted in a contraction in the nation’s economy, brought a crisis of confidence among investors, decline in investment, and a huge capital outflow (Government of Malaysia, 2004; Kaziah, 2000). As explanations (and accusations) were advanced as to the cause of the crisis<sup>13</sup> the government undertook several immediate corrective measures to contain it<sup>14</sup>.

To the public service, the crisis was an even bigger challenge than the previous economic slowdown of the 1980s. It revealed several weaknesses in the Malaysian economic system and reflected the immense challenges, both global and domestic,

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<sup>12</sup> Interchangeably used with the term currency crisis, see Ghosh (2003) for definition.

<sup>13</sup> The Malaysian Prime Minister blamed currency speculators whereas others suggested reasons such as traditional relationship-based business model (Government of Australia, 2002) and control of capital flows (Doraisamy, 2001).

<sup>14</sup> One of the first steps was to drastically reduce budgeted allocations to government agencies and to stop several mega projects such as the RM 13.5 billion (USD 3.5 billion) Bakun Hydroelectric Dam Project. Falling back to their old style in dealing with crisis, the government established the National Economic Action Council (NEAC) using the Operations Room technique. The NEAC, in the spirit of the struggle mentioned earlier, operates from a control room, monitors the economic pulse daily and reports ultimately to the Prime Minister (Milner, 2003). The refusal to accept help from international financial institutions such as the International Monetary Fund (IMF) distinguishes Malaysia’s response to the crisis from those of its neighbours such as Thailand, South Korea and Indonesia (Common, 2003). This decision can be linked to the complexity of Malaysia’s situation with regard to its ethnic problems and the government’s persistence in protecting the Malay interest.

the nation would face in the future<sup>15</sup>. For many years, countries within the Southeast Asian region in general and Malaysia in particular have demonstrated a remarkable ability in attracting Foreign Direct Investment (FDI) inflows. Most of the FDI's were brought in through multinational enterprises from developed nations. However, at the outset of the crisis, it was obvious that loose control on FDI inflows had an adverse impact on the nation's research and development (R&D) capabilities<sup>16</sup>.

With little transfer of technology happening and insignificant government effort to encourage development of indigenous technology, Malaysia was left more vulnerable whenever a multinational decided to relocate itself to another country. No local companies were able to fill up the vacancy left in that particular economic sector. On the other hand, emerging markets such as Vietnam with cheaper labour packaged with attractive government incentives posed a threat to the "older" economies like Malaysia, Thailand and even Singapore. Much worse was the threat from China (Onn et al., 2003-2004) with its unprecedented growth rate, that is absorbing much of the investment that used to bring much wealth to the region<sup>17</sup>.

Such an outlook forced Malaysia to intensify its efforts to stay ahead of these more dynamic developing countries if it were to keep its dream of catching up with the developed countries. Furthermore, Malaysia's fall in international competitiveness as

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<sup>15</sup> Weak coherence between financial capital institutions, market structures and existing governmental institutions was claimed to cause the nation to respond poorly to the global economic environment of the 1990s (Sri Tharan, 2001). Furthermore, the Malaysian economy depended too much on foreign labour, technology and capital and lacked satisfactory and strong macroeconomic fundamentals (Ghosh, 2003).

<sup>16</sup> Most multinational enterprises merely wanted to take advantage of the cheap labour and incentives provided by countries in the region but retained much of their R&D activities in their home countries (Konstadakopulos, 2002).

<sup>17</sup> FDI inflow to Malaysia, according to UNCTAD, dwindled markedly from US\$3.8 billion in 2000 to US\$554 million in 2001. The Malaysian Industrial Development Authority (MIDA), on the other

recorded by the World Competitiveness Report, from 18<sup>th</sup> place in 1994 to 29<sup>th</sup> in 2001 (ISIS, 2002), prompted another shift in the government's economic strategy (Onn et al., 2003-2004). The government, realising the uncertainty of relying on FDI, now began to focus towards developing domestic-based sources of growth.

### **1.6.3 The National Vision Policy Phase (2001-2010)**

Developing domestic-based sources of growth was one of the new policy dimensions introduced in the National Vision Policy (NVP)<sup>18</sup>. The NVP, conceived in April 2001, provides guidance to all development efforts over the period 2001-10. Among its primary targets was education and it seeks to refocus the economy toward higher-technology production.

With the regional and global changes taking place, the government realised that Malaysia's future rests in its ability to transform itself into a Knowledge-Based Economy. The nation's past advantage as a low-cost producer has been overtaken by other nations. Its dependence on factors such as labour, land and natural resources must now move towards the capability to produce, acquire, utilize and disseminate knowledge.

The major development thrusts for the knowledge-based economy are set out in the Third Outline Perspective Plan (OPP3) (Government of Malaysia, 2001b; p.133).

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hand, reported that approved foreign manufacturing investments from January to September 2002 fell to just RM5.8 billion compared to RM18.8 billion for the whole of 2001 (Onn et al., 2003-2004).

<sup>18</sup> The other policy dimensions include: developing Malaysia into a knowledge-based society; increasing the dynamism of the agriculture, manufacturing and services sectors through greater infusion of knowledge; addressing pockets of poverty in remote areas; achieving effective Bumiputera participation as well as equity ownership of at least 30 per cent by 2010; increasing the participation of Bumiputerans in the leading sectors of the economy; and re-orienting human resources development to support a knowledge-based economy.

Among them are recognition of the need to build the knowledge manpower base through a comprehensive review of the education and training system, the introduction of a system for life-long learning and a brain-gain programme; raising the knowledge-content in the agriculture, manufacturing and services sectors; and reinventing the public sector to become more proficient in the acquisition, utilization, dissemination and management of knowledge.

Further efforts to realise the knowledge-based economy were made with the release of the Knowledge-Based Economy Master Plan in September 2002 (Onn et al., 2003-2004). Aimed to provide the platform to sustain a rapid rate of economic growth and enhance international competitiveness to achieve Vision 2020, the Knowledge-Based Economy Master Plan emphasized the need to increase knowledge content in all activities to strengthen the country's competitive position (Goh and Lim, 2004). Other sectoral master plans within other specific areas such as the Capital Market Master Plan and the Financial Sector Master Plan were also tailored to reflect knowledge content. For example, the second Industrial Master Plan (1996-2005) which required a total investment in the manufacturing sector of MYR 250 billion, was based on a strategy of moving the Malaysian manufacturing sector from assembly-based to value-chain-based manufacturing, from sector-based to cluster-based development and from performance targets to productivity-driven growth (OECD, 2000).

Malaysia's transition into a knowledge-based economy, however, will not be easy. One major stumbling block is the acute shortage of highly skilled manpower, particularly engineers and scientists (Onn et al., 2003-2004). A long history of taking

the easy option in becoming dependent on foreign technology (Goh, 1999) impedes growth of local R&D. Nationalist movements, interwoven with complex ethnic issues, have been accommodated for a long time, resulting in the gradual end to the widespread use of English as a medium of instruction (Konstadakopoulos, 2002). Addressing these shortcomings will place immense pressure on the government and its public service in the current developmental stage.

### **1.7 Significance of the Research**

The chosen research topic is important for several reasons. Firstly it has implications for the practice of management development for the Malaysian public service managers. The present research sought to determine whether the Malaysian public service's persistence with formal learning approaches to management development is the right approach to follow. This was done in two ways. Firstly, detailed secondary research was conducted by reviewing the field of literature concerned with formal versus informal learning. Secondly, it investigated whether tacit knowledge, a form of knowledge viewed by many as important for successful managers, is associated with learning styles, an individual difference trait more prevalent in informal learning environments. The finding of an association would imply that management development planners in the Malaysian public service should give equal importance to the unplanned, informal, on the job learning as to the planned and deliberate training and development efforts, and consider aspects of matching the learner to the learning context.

Theoretical arguments that will be discussed later suggest that equal weight should be given to learning that occurs in informal environments as well as those associated

with planned and deliberate learning can perhaps be extended to the field of management development in general. Whilst many authors have echoed this sentiment before (e.g. Cunningham and Dawes, 1997; Mumford, 1997; Fox, 1997b), the present study attempts to provide empirical evidence to support this view.

Furthermore, the study also extends the work of Sternberg and his group within the field of work psychology with respect to their research on tacit knowledge in the professions. There has been a substantial amount of research into the nature of tacit knowledge in a variety of professions such as nursing (Benner and Tanner, 1987; Eraut, 1994; Herbig et al., 2001), education (Nestor-Baker and Hoy, 2001; Minstrell, 1999; Leithwood and Steinbach, 1995; Almeida, 1994), medicine (Cimino, 1999; Patel et al., 1999), and Law and Accounting (Marchant and Robinson, 1999; Tan and Libby, 1997). Most of these studies have been focused on identifying the contents of tacit knowledge and its ability to predict success in the various professions. Within this body of research, a general finding is that experts tend to display higher levels of tacit knowledge than novices. This finding has led several researchers to question why some people learn more from their experience than others (Colonia-Willner, 1998; Reuber et al., 1990). The present study aims to add to knowledge in this field by looking at aspects of learning that contribute to the accumulation of managerial tacit knowledge. In the researcher's view, placing emphasis on the learning process itself will be more fruitful than searching for tacit knowledge content necessary for success in a particular profession, due to the very situational and contextual nature of tacit knowledge.

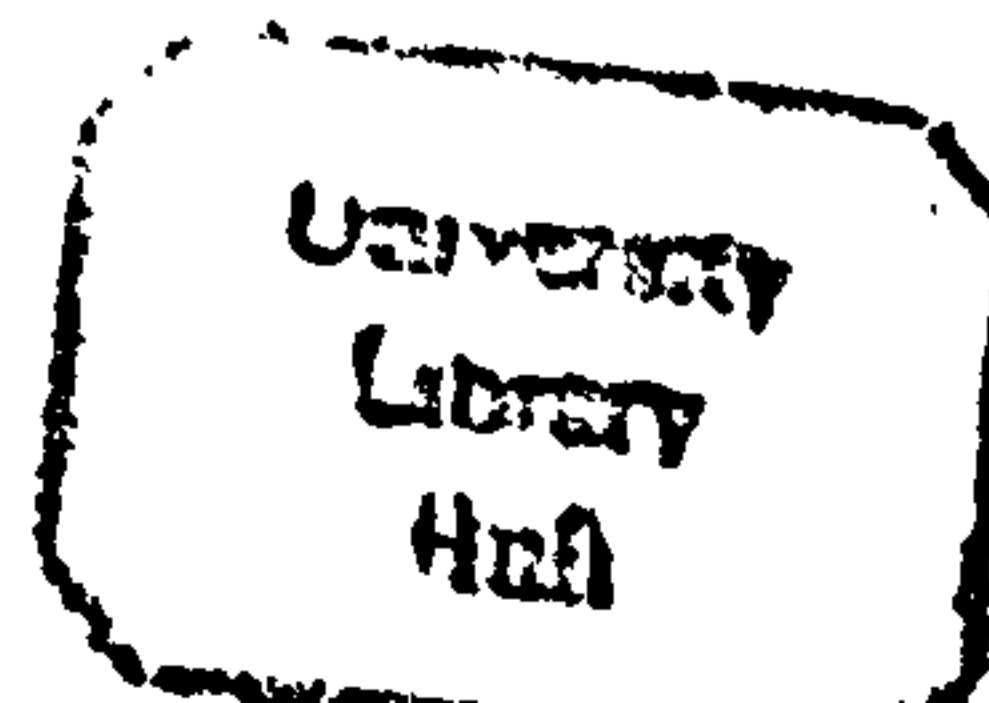


**CHAPTER 2**  
**MANAGEMENT DEVELOPMENT IN THE MALAYSIAN PUBLIC**  
**SERVICE**

**2.1 Introduction**

In contrast to most developed countries, the public service of Malaysia (as well as in many other developing countries) is central to the nation's economic activity (Farashahi & Molz, 2004). Ever since Malaysia achieved its independence in 1957, the public service has played a dominant and crucial role in the development of the nation. It achieved remarkable success in the first two decades in ameliorating the problems of poverty and improving equality between its major ethnic groups through rapid economic growth (Verry & Lucas, 1999). However, pressures brought by market forces compelled it to change its old work culture and routines to adopt reform measures.

The Malaysian public sector management development initiatives are intertwined with the country's national development agenda as outlined in the previous chapter. Most of the management development programmes came as part of a broader reform of the entire public service. This aimed not only to modernize but also to adjust the role of the public service to changes in the nation's socio-economic development strategy. These reform measures also brought a change to management development practice for the public service managers. This chapter maps these transitions in Malaysian public service management, preparatory to a discussion of management development initiatives in the Malaysian public service. Due to the linkage between the reform measures and the national development agenda, discussion on the public



service administrative reforms will similarly be structured according to the national development phases of the New Economic Policy, the National Development Policy, and the National Vision Policy.

## **2.2 The Malaysian Public Service Administrative Reforms**

Upon attaining independence in 1957, Malaysia began to undertake various socio-economic development programmes. However, the role of the public service remained relatively unchanged as local administrators gradually took over the reins of office from the English. The main focus was on maintenance of law and order and the collection of revenue (Muhammad Rais, 1995).

Efforts for administrative reform began in the late 1960s with strong pressure for the public service to undertake the government's development agenda<sup>1</sup>. The government realised that the burden of bureaucracy would increase rapidly. However, local public servants were not well trained and were inexperienced in managing large-scale activities. Therefore, it became a priority for the government to reform the public service to enhance its efficiency and capability for development administration.

To assist in this process, a team of consultants obtained from the Ford Foundation was engaged in 1965. Led by two American public administration experts John

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<sup>1</sup> The Alliance Government based on the results of the 1964 general elections noticed that its support base lies with the poor rural population. Determined to retain its power, the government was forced to fulfil its election promises of increasing the welfare of the citizens and raising the standard of living of the masses. The Alliance Government was fully aware that the survival of the Alliance government depended on the capacity of the public service to deliver development to this group of people (Sri Tharan, 2001).

Montgomery and Milton J. Esman, the team reviewed the entire public administration of Malaysia, looking for ways to increase efficiency and attain administrative leadership in the public service (Montgomery & Esman, 1966). The guiding principle was that the administrative reforms must not be merely directed towards strengthening managerial or policy-making and planning capacities but must also enhance the state's capacity for managing and resolving communal conflict in the country (Esman, 1972).

The team's final report recommended several broad areas for improvement especially in reducing government costs, increasing service quality of government agencies and taking steps to reduce the time in government processes. Based on the report, a proposal for reformation of the Malaysian public service was put forth. A major governmental action recommended was for the creation of a Development Administration Unit (Ahmad, 1998). This unit, staffed by professional management analysts, would plan and guide the major problems of administrative improvement for the entire government. The Development Administration Unit (DAU) was subsequently established in November 1966.

### **2.2.1 The New Economic Policy Phase (1970-1990)**

The functions of the Malaysian administrative system under the New Economic Plan (NEP) were instituted to allow the government to play a 'developmentalist' role. Sizable public expenditure was allocated to operating ministries for poverty eradication and to public enterprises for economic restructuring. The growing public expenditure required a network of agencies, centralized around the Prime Minister's Department, with extensive policy and managerial capacities for coordinating

planning and implementation activities from the federal to the local district levels in a top-down manner (Sri Tharan, 2001). Coordinating the numerous agencies, a common problem in modern public management (Betancourt, 1997) began to cause serious problems for the Malaysian public service. The solution adopted by the government, was the Operations Room Technique<sup>2</sup> (Kuhonta, 2002; Milner, 2003), significantly changed the way public agencies operated. Whereas previously they had worked independently, now the agencies had to work together in unison.

The increasing complexity and expansion of functions of the public administration focused further attention on its effectiveness. To meet these urgent needs, the government in 1977 set up the Malaysian Administrative Modernization and Manpower Planning Unit (MAMPU), to implement administrative reforms in the Malaysian civil service. It was placed in the Prime Minister's Department to give it "sufficient political leverage to carry out directed programs of reform" (Ahmad, 1998; p.66).

The quest for effectiveness under the NEP phase, however, became insufficient in light of the volatile economic environment of the 1990s. The need for greater coherence between governmental and market institutions became apparent as the government shed its "developmentalist" role to tackle newer challenges facing the nation (Sri Tharan, 2001).

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<sup>2</sup> Under this technique, Operation Rooms were created at the Federal, State and District levels. The Operation Rooms were filled with maps and charts that monitor the progress of projects by various departments. A copy of the Rural Economic Development (RED) Book was kept at the National Operations Room, the State Operations Room and the District Operations Room (OECF, 1997). The RED Book contains information at the village level on all projects to be implemented. This technique worked well to overcome the problems faced in implementing rural development programmes. It

## **2.2.2 The National Development Policy Phase (1991-2000)**

The government's changing stance over economic development from a leading to a facilitating role (Jabroun & Balakrishnan, 2000; Sarji, 1996a: 21) was accelerated through its policy of privatization, as an institutional reform measure, which gained impetus in the 1990s. This forced the public service to adopt drastic reform measures to assume its new role. The government's launching of the Excellent Work Culture Movement in November, 1989 (Osman et al., 1998) was claimed as the turning point to a more concerted reform effort for the public service. It attempted to inculcate the values of professionalism, accountability, integrity, quality, productivity, and innovation into the public service. These values constitute what is termed a managerialist reform approach (Haque, 2001) and took the Malaysian public service into a business-like transformation reminiscent to the widely publicised reform measures engulfing the public bureaucracy in developed nations. The reform efforts were aimed at having the required structure, systems and culture of quality and customer focus in place.

The implementation of all the reform initiatives<sup>3</sup> in the government agencies was supervised by a high-powered committee established in 1986, called the Panel on Administrative Improvements to the Civil Service (PANEL) (RIAP, 2001). PANEL

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improved communication and coordination between different agencies involved and created team spirit and cooperation towards a common objective.

<sup>3</sup> The changes the Malaysian public sector went through this period constitutes a "paradigm shift" (Sarji, 1996a: 21) in a similar vein to the public sector reforms in the United Kingdom. Toonen and Raadschelders (1997) argued that the United Kingdom public administration does not have a tradition of business management linked to it much as in the United States. Therefore, the business-oriented approach of reform under the umbrella of New Public Management (NPM) in the United Kingdom does constitute a shift in paradigm from their traditional role. The changes the Malaysian public service went through within this period in their attempt to institutionalize a "culture of excellence" (Siddiquee, 2002: 114-115) were the biggest in its history. However, the reform mechanism that was in place managed to ensure the smooth transition to the new paradigm.

ensures that the administrative improvement programmes are undertaken throughout the public service, besides identifying newer initiatives and strategies to be taken to further improve the public sector.

**Table 2.1: Development Administration Circulars within the period of the Second Outline Perspective Plan (OPP2)**

<b>Circular No.</b>	<b>Development Administration Circular Title</b>
No. 1 of 1991	Guidelines For The Improvement Of The Quality of Services Rendered Through The Telephone
No. 2 of 1991	Guidelines On The Management Of Meetings And Government Committees
No. 3 of 1991	Public Service Innovation Awards
No. 4 of 1991	Guidelines On The Strategies For Quality Improvement In The Public Service
No. 5 of 1991	Guidelines On The Integrated Scheduling System (SIAP)
No. 6 of 1991	Guidelines On Productivity Improvement In The Public Service
No. 7 of 1991	Guidelines On Quality Control Circles In The Public Service
No. 8 of 1991	Guidelines On The Manual of Work Procedures And Desk File
No. 9 of 1991	Guidelines On The Implementation of Malaysia Incorporated Policy
No. 10 of 1991	Guidelines For The Improvement Of The Quality of Counter Services In The Public Service
No. 11 of 1991	Guidelines On The Use Of The Work Action Form
No. 1 of 1992	Guidelines On Total Quality Management in The Public Service
No. 2 of 1992	Guidelines For Development Project Planning and Preparation
No. 3 of 1992	Manual On Micro Accounting System (SPM)
No. 4 of 1992	Managing Public Complaints
No. 1 of 1993	Guidelines On Morning Prayers
No. 2 of 1993	Guidelines For The Award of The Public Service Excellent Service Awards
No. 3 of 1993	Guidelines On Clients' Charter
No. 1 of 1995	Use of Information In Application Forms And Specific Criteria In Decision Making
No. 1 of 1996	Implementation Of A Standard Computerised Accounting System In The Federal Statutory Bodies
No. 2 of 1996	Guidelines For Implementing ISO 9000 In The Civil Service
No. 1 of 1997	Guidelines For The Establishment Of The National Infrastructure For Land Information System (NaLIS)
No. 1 of 1999	Guidelines For The Implementation of Benchmarking In The Civil Service

Another important mechanism to facilitate the implementation of the reform efforts was the detailed circulars that acted as the main reference for all agencies to follow (Yaacob, 1992). Twenty-three Development Administration Circulars (Table 2.1) were distributed within this period, providing standardized guidelines on the reform programmes throughout the public sector.

Complementing the above reform efforts were changes in the public servants' performance appraisal system, to re-orient the public service towards performance and results. The automatic annual increment of the old system was abolished in favour of a four-tier salary progression system, including a new bonus system. Another significant reform measure<sup>4</sup> was in the handling of public complaints. The Public Complaints Bureau deals with even minor complaints, such as delays in processing applications, unfriendly counter service and lack of enforcement<sup>5</sup>.

The 1997 Financial Crisis prompted the next stage of public sector reforms. These involved changing and simplifying existing processes, streamlining rules and regulations and reviewing existing formats for service and licence applications. Agencies were also requested to review their decision making process and specifically to reduce the need for discretion and to have the decision criteria written.

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<sup>4</sup> The strengthening of infrastructural resources was also taken to support the reform measures. The Civil Service Link (later renamed as Malaysian Civil Service Link) is a computer-based repository of information on the Civil Service and its administration. It provides the public a single gateway to access all Malaysian government agency websites through the internet. The Civil Service Link emphasized on providing data of interest and importance to the private sector.

<sup>5</sup> While many of the reform measures addressed quality and productivity improvements in the public service, accountability among public servants was tackled through the establishment of the Public Complaints Bureau. Although the existing institutions such as the Public Accounts Committee, the Committee on Government Business, the Anti-corruption Agency and the office of the Auditor-General serves to enforce accountability and integrity among public officials, they are generally

### 2.2.3 The National Vision Policy Phase (2001-2010)

In contrast to the shift in paradigm required during the transition from the NEP phase to the NDP phase, the general reform movement towards the NVP phase was less drastic. It was more of a continuation from the efforts initiated under the past development plans. The aim was to contribute in transforming Malaysia into a fully developed nation status with a value-based society as envisaged under the ambitious Vision 2020. In its bid to achieve this ambition, the government placed much hope on the application of Information and Communication Technology (ICT) as the means to reach its goal (RIAP, 2001; Tipton, 2002). The Multimedia Super Corridor (MSC) project<sup>6</sup>, launched in 1996, became the main vehicle to leverage the nation's status into the ranks of high-technology countries at the cutting edge of social, economic, and technological development.

Most of the impetus for reforms to the Malaysian public service in this period came from this aspiration to transform Malaysia's production-based economy into a knowledge-based economy. The Third Outline Perspective Plan (OPP3) revealed several steps to be taken by the public service to transform and reinvent itself for this purpose (Government of Malaysia, 2001b).

For the first step, to propel the development of the knowledge-based economy, the OPP3 pointed to the need for the public service to continue with its facilitative role

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closed to the public and only handled relatively large malpractices in the public service covered by law.

<sup>6</sup> The MSC occupies a physical corridor 15 kilometres wide and 50 kilometres long stretching from Kuala Lumpur south to the new international airport and two new cities, Putrajaya and Cyberjaya, connected by a high speed, high capacity fibre optic Internet backbone. Putrajaya, the new administrative centre, holds almost all government departments and agencies. On the other hand, Cyberjaya, the new "e-commerce centre", is a 7,000-hectare development, now has about 8,000 residents, 150 MSC-status companies, and the new Multimedia University (Huff, 2001).



and act as a catalyst for the private sector to spearhead the development of the knowledge-based economy. They must also provide an appropriate environment for private sector participation through a stable macroeconomic environment, making available the basic infrastructural facilities, developing an education and training system capable of supplying the knowledge manpower, encouraging as well as undertaking R&D, creating a conducive regulatory framework and initiating the development of flexible financing mechanisms.

The second step, adoption of advanced IT and multimedia technology, was to be realised through the implementation of several projects (Government of Malaysia, 1999). The first was the electronic government or e-government project, one of the flagship applications of the Multimedia Super Corridor. E-government calls for the application of information and multimedia technology to improve the productivity of the public service. It was meant to strengthen the collaborative environment between the government and private sector and to upgrade the quality of public sector service delivery. Another project, the Malaysian Civil Service Link (MCSL), created earlier as a computer-based repository of information on the Civil Service and its administration, was upgraded through registration of its website with several major Internet search engines (ISIS, 2002). This project requires government agencies to design, develop and maintain their own websites.

Benchmarking was also identified in OPP3 as an important administrative improvement initiative to be adopted by the public service. Benchmarking is the systematic identification of the best practices employed by other jurisdictions that lead to superior performance (Cohen and Eimicke 1998; Keehley et al. 1997). It was

claimed to be able to ensure continuous quality improvement through a systematic and continuous process to identify, learn, adapt and implement best practice.

Finally, OPP3 also stressed the importance of continuously upgrading the skills of the public sector. It proposed the introduction of programmes to instil greater resourcefulness and nurture innovative capability within the public sector. Furthermore, it suggested a reorganization of the structure of the public sector to make it more responsive, flexible and transparent. A major move to this effect was the introduction of a new scheme of service in 2002 called the Malaysia Remuneration System (MRS). The MRS is based on increased competency and in-depth knowledge to promote a shift in attitudes of public servants to achieve excellence in the public service (Government of Malaysia, 2002).

The above reform efforts undertaken by the public service can only achieve their goals with a parallel effort to equip public service personnel with the necessary knowledge, attitudes and skills. Leading the reform efforts in all the government agencies are its public service managers and, therefore, it is imperative that the public service prioritize the training and development of this group.

### **2.3 Development and Education of Malaysian Public Sector Managers**

The Montgomery-Esman study, the watershed in the Malaysian public service administrative reform movement, was credited with the establishment of the Public Services Department (PSD), the National Institute of Public Administration

(INTAN<sup>7</sup>), and the Malaysian Administrative Modernization Planning Unit (MAMPU) (OECD, 1998). The study was also instrumental in laying the foundation for the public service training policies and programmes (Ahmad, 1998). While MAMPU or the Development Administration Unit (DAU) as it was known before 1977 realized the study's recommendations for reforms in the public administration, the other two were instrumental in realizing the study's vision for an improvement in the Government's education and training programmes at all levels. An emphasis was placed by the study on the importance of strengthening the professional competence of the administrative officers. This was to provide the necessary administrative leadership for the rapidly developing country and it called for a post entry course in development administration for all newly selected administrative officers. For middle level public officers, an expanded in-service training facility was essential, as were opportunities for a continuing mid-career university-level education for selected officers. The study also proposed periodic seminars for senior officials.

The key role in fulfilling education and development needs in the public service was played by the Malaysian Public Services Department (PSD). The PSD is a centralized agency in charge of civil servants' affairs (Jabroun & Balakrishnan, 2000). It is the supreme public administrative body in Malaysia (Kanji & Tambi, 1998) and it took charge of the overall human resources management for the public service. The PSD's training arm, the National Institute of Public Administration, also owes its birth to the Montgomery and Esman report, which outlined the critical role of personnel training and development in order to improve the Malaysian Government administrative system. One of the first tasks undertaken by the DAU

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<sup>7</sup> The Institute takes its acronym from its Malay equivalent - Institut Tadbiran Awam Negara.

upon its establishment in November 1966 was to carry out a survey together with the Staff Training Centre on the training needs of government personnel in various ministries, departments, statutory bodies and state governments. The 1967 “Report on Training for Development in West Malaysia” proposed that the Staff Training Centre be upgraded and be replaced by a “National Institute of Public Administration”. Based on the report, the National Institute of Public Administration was subsequently established in 1972. The new agency focused its effort on institutional building with its primary objective to:

- enhance the capacity of the administrative system to develop and implement national policies and programmes, and
- develop progressive approaches and attitudes among civil servants in performing their leadership role as primary agents of change in Malaysia’s multi racial society

One of the major thrusts for the knowledge-based economy set up in the OPP3 was “reinventing the public sector to become more proficient in the acquisition, utilization, dissemination and management of knowledge” (Government of Malaysia, 2001b: 133). This would require the public service to perform two important functions: to facilitate the development of the economy and to transform itself into a knowledge-based public service (ISIS, 2002). The latter objective involved the development of more than 900,000 people.

The Malaysian public services planning towards becoming a knowledge-based public service, however, goes beyond education and training. It is part of an overall human resource management strategy, including selection, recruitment, career planning and

development, appraisals and remuneration systems. Human resource development activities formulated by the Malaysian Public Service integrate technology and people and cover the system of remuneration, the application of information and communication technology (ICT), and training and development.

### **2.3.1 The Remuneration System**

The Malaysian Public Service used the remuneration system that covers almost the entire service, as an important tool to attain public service goals. Revision of the system was carried out whenever the need arose. The move to a knowledge-based civil service was one such instance. The New Remuneration System (NRS), implemented in 1992 introduced extensive changes to accommodate the directional changes in the national development process. With the reform initiatives at that moment undergoing businesslike transformations (Haque, 2001), a link between performance and financial reward was built into the NRS (RIAP, 2001). The number of schemes in the public service was also reduced from 574 to 19 (Painter, 2004). Consideration for placement, training, promotion, and salary increments in this system is now based on merit, job performance, and contribution to the departmental objectives (Malek Shah, 2003). The NRS for the first time incorporates the idea of annual bonus payout in public service. More importantly, the NRS introduced a “matrix schedule” for salary increments where a horizontal progression was given to an average performing public servant, vertical movements for excellent persons and the most outstanding public servants were given diagonal salary movements (RIAP, 2001). No pay rise was given to unsatisfactory performing public servants, in what was termed as a “static” progression. Finally, the NRS also changed the way promotions are made. Under previous systems, promotions depended on vacancies

and were filled by the most senior person in line. However, the NRS provided opportunity for outstanding performers to be promoted ahead of others who are more senior.

After a decade in effect and in the face of a changing environment and new challenges, the NRS was reviewed in conjunction with the advent of the knowledge-based economy<sup>8</sup>. The revision resulted in a revised scheme, the Malaysia Remuneration System (MRS), launched in 2002. Closely related to the plan for a knowledge-based civil service, the core to the MRS is the application of competency as a basis for human resources development and reward system (Sani, 2002). It was also claimed to be more responsive to the changing environment, more attractive to high-calibre people but more importantly, designed to meet the needs of the knowledge-based economy (Malek Shah, 2003). Whereas the NRS tied rewards to performance, the MRS linked rewards to competency achievement (“Prudent management,” 2002). By placing prominence on knowledge acquisition and skill development, the MRS was intended to inculcate the culture of continuous learning and develop knowledge workers in the public service.

On top of the existing annual performance appraisal reports, the MRS introduced competency assessment in the form of examinations that evaluate the competency levels of public personnel. The government hoped such a system would encourage self-development among employees who would need to pass the examinations for

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<sup>8</sup> The union for public service (CUEPACS) objected considerably to the NRS as it was claimed to create resentment and frustration among those who miss out on accelerated increments and rapid promotion. Despite this being a common phenomenon in such a system, complaints over the NRS generally was due to the lack of transparency in performance evaluation that was based on subjective judgments (RIAP, 2001).

annual salary progression and promotion. A Human Resource Development Panel established in each government Ministry and Department determined the salary progression of the employees under their jurisdiction. This panel was also responsible for identifying training needs and recommendation of counselling for employees.

### **2.3.2 Application of ICT**

Many governments generally view ICT as a means for their public service to achieve modernization, enhancing efficiency and effectiveness and providing better service delivery to the public (Tipton, 2002). This has resulted in their investing a substantial effort to familiarize their employees with the technology. The same can be said for Malaysia.

Malaysia public service's ICT plan was quite extensive and as mentioned earlier it includes the E-Government project, the Malaysian Civil Service Link (MCSL), and various other inter-departmental systems. However, directly for the purpose of human resources in the public service was the development of the Human Resource Management Information System (HRMIS). The system was aimed at providing an effective and efficient system for managing human resources in the public sector.

As the custodian of the public services human resources policies, the PSD was made responsible for the implementation of the HRMIS project. The centrally controlled human resource functions, all converging towards the PSD, would be made enormously easier and faster with the system. Furthermore, the system would electronically link all government agencies to the lowest level at the districts, making

human resource information easily be transmitted to either the headquarters of agencies, Ministries, the State Secretariat Offices and ultimately to the PSD.

The HRMIS application was modelled based on a competency-based human resource management (Malek Shah, 2003). This is in line with the Knowledge-based Economy Masterplan's recommendation that the public service adopt a competency-based model on management of human resources. It claimed that a competency-based human resources management would ensure that "each post is filled by the most competent person available for the job, and that competencies are constantly upgraded to ensure a knowledge-based public service. It will also induce public sector employees to engage in lifelong learning, and help to enhance quality, efficiency and productivity in the public service" (ISIS, 2002: p.142). The development of the model involves two stages - first, drawing up competency profiles for each post and incumbent and second, using the competencies defined as the basis for recruitment, emplacement, assessment, promotion, remuneration and training. HRMIS will maintain data on competencies at both the person level and position-specific level, as well as specifically defined competencies for the purposes of each of the human resource function, e.g. remuneration, rewards, or development. This competency element drives the system and all human resource functions are executed accordingly.

The absorption and application of ICT in the public sector would require changes to be made to management practices and would involve among other things, cultivating employee receptivity. Furthermore, the lack of trained IT and knowledgeable personnel to support the application and diffusion of IT is a major challenge in



efforts to expand the use of IT in the Malaysian public sector (Government of Malaysia, 1999). Transforming a work culture that has been fostered for a long period will require a process of unlearning and re-learning (ISIS, 2002). These changes are usually dealt with under training and development.

### **2.3.3 Training and Development**

The training and development component of the human resource development strategy in the Malaysian public service placed importance on continuous training of the workforce (Government of Malaysia, 2001a). During the reform period under the National Development Policy phase, the order of the day was to move from planned economy toward market culture (Koubek and Brewster, 1995) and to get the public service to better understand and adopt business-related work values (Abdullah, 1994; McGaughey et.al., 1997). Much of the training and development emphasis, therefore, was on instilling the necessary attitudinal and mindset changes of the workforce to ensure the effective and efficient delivery of quality outputs (Malek Shah, 2003). Besides that, it was also aimed at developing the adaptive skills of public employees (Siddiquee, 2002). This was important, especially since many public servants are centrally controlled through the PSD; adaptability would facilitate staff redeployment to the federal, state or even the local council level. Finally, the Malaysian public service training and development programmes also aimed at improving public employees' job satisfaction, enhancing their career prospects and taking advantage of the government's huge investment in information and communication technology<sup>9</sup>.

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<sup>9</sup> The Service Circular No. 6/1984 provides the general outline for the training policies in the Malaysian Public Service.

Training and development are implemented through short, medium and long-term courses. Long-term courses usually involve university education at all levels up to the doctorate levels. They are meant for public servants at the Management and Professional level. Study leave and sponsorship facilities are provided. The Training Unit in the Public Services Department directly handles offers for long term courses, which are intended to develop specialized knowledge in public servants. Short and medium term courses expose public servants to new management techniques and enable them to master new technologies. Top management executives underwent short courses to enhance their management and organizational skills. Under the Seventh Malaysia Plan when the government introduced various measures to improve the public sector in areas of management integrity, the quality of services, work ethics and organizational structure (ISIS, 2002), the PSD sponsored 6,850 public service officers for certificate, diploma, degree, masters and doctorate level courses. Due to the considerable size of the Malaysian public service, the capacity of the PSD to sponsor public servants to study in either local or overseas institutions is very limited. Therefore, the role of training and developing in the public service rests mostly on the shoulders of INTAN.

#### **2.4 INTAN's Role in the Development of Public Personnel**

The training arm of the PSD, INTAN, is the premier public service training institution and is responsible for all levels of public service employees. Its niche is however in providing development programmes and leadership training for the managers in the public service (Malek Shah, 2003). INTAN annually conducts training programmes for an average of 25,000 to 30,000 government officers. A substantial part of INTAN's resources are reserved for the development of the

Administrative and Diplomatic Service (ADS) officers. This is because members of the ADS filled up most of the management and leadership positions in the public service. An extensive regime of training and development programmes are designed for this group of managers to facilitate competency development as they progressed in their career path. INTAN's training programme can be divided into two types: policy-related and process-oriented (Siddiquee, 2002).

#### **2.4.1 INTAN's Training and Development Programmes**

At the centre of the process-oriented training programme for the ADS is a series of compulsory courses beginning with the Diploma in Public Management course. Selection of officers for the ADS involves a few days of assessments at selected Assessment Centres, followed by examinations and interview. Successful candidates then attend the Diploma in Public Management course (Shaari, 1980). Only upon successfully obtaining the Diploma can they be confirmed in their job. Further down the line in their career, they must attend more mandatory courses designed to develop them to assume heavier responsibilities. For example, under the newly introduced Malaysia Remuneration System (MRS), INTAN is required to design, implement and conduct competency assessments for the ADS officers at every promotional level. INTAN also conducts other process-oriented programmes that are opened to the other services. Process-oriented training programmes are intended to introduce newer management principles and techniques, to ensure that public service managers are qualified and capable to perform their duties.

On the other hand, policy-related training programmes are meant to familiarize the public servants with important government policies, especially the new ones. INTAN

was among the first agencies to respond whenever the government introduced new policies that must be disseminated among the public servants. INTAN has expended considerable effort in designing and implementing training programmes on policies such as the Privatisation Policy and Malaysia Incorporated, which involved a change in managers' mindset as well as their work routines.

INTAN further tailors its training for the development of managers in terms of organizational levels: individual, supervisory and management, and leadership (Fauziah, 1980; Malek Shah, 2003). The individual level forms the foundation for competency development and the focus is on human relations, ethics and values, communication skills, basic computer skills, and language capability. INTAN's management training for the supervisory and management level covers six major areas: Economic and Business Management, Human Resource Management, Financial Management, Quality Management, ICT Management, and Urban and Environment Management. The highest level of management training and development at INTAN focuses on leadership capabilities. This includes mandatory courses such as the one mentioned above, which all public service managers must attend according to a prescribed schedule. INTAN also places equal emphasis on other aspects of leadership development, including Leadership and Organization Management, Strategic Management, Leading Change, Learning Organizations, Conflict Management and Negotiation, and Creative Thinking.

The main policy decisions of INTAN are determined by an Advisory Council (INTAN, 2001), established to assist and advise INTAN towards achieving its objectives. The Council, which meets at least once a year, is made up of ten

permanent members coming from various sectors including key government officials, the university and the private sector. The chairman can appoint an additional six members for a period of not exceeding three years.

Management development programmes at INTAN are not confined to courses, but include other important development activities, such as special talks and panel discussions. An example is the Executive Roundtable-INTAN (ERTI), which uses a roundtable discussion format to provide an avenue for public service managers to discuss various current issues, including politics, management, social and economics with invited experts, politicians, academicians, and corporate figures. Previous examples of ERTI roundtable discussions are “Marketing Malaysia in a Globalised World” and “Privatization Revisited: Issues and Challenges” (INTAN, 2001a).

Another popular programme is the INTAN Executive Talk series. These weekly one to two hour sessions are aimed at fostering a closer working rapport between the government officers, private sector, academic representatives and members of the foreign commissions. The diverse range of development programmes for the public sector managers also includes conferences such as the annual National Civil Service Conference, and special seminars with topics depending on the current needs and demands.

#### 2.4.2 INTAN's Strategic Role

Trezzini (2001) described INTAN as one of three state agencies that are responsible for safeguarding and enhancing the performance of civil service in Malaysia<sup>10</sup>. INTAN assumes a strategic role in the national transformation process through designing and implementing training programmes (Malek Shah, 2003). Huge government resources are allocated to INTAN for this purpose. INTAN's top leadership and policy makers pay much attention to raising its training quality and capability. The strategy of INTAN's training programmes is to increase the efficiency of the public sector, stimulate changes in the management of public sector organizations, institutionalise a culture of excellence, increase accountability and discipline and finally, to prioritise and strategize training programmes to meet current needs and future challenges of the nation.

The nature of management development programmes at INTAN has changed in accordance with the needs of the public service. Earlier in its existence, INTAN directed most of its efforts towards programmes such as project management, agricultural and financial management. This was to accommodate the demands of development projects under the New Economic Policy for the public enterprises. As the nation progressed into the National Development Policy Phase, INTAN made changes to its training programmes to follow suit. Siddiquee (2002) noted these changes from the change of slogan used to describe training; from "training for development" in the 1970s to "training for quality and excellence" in the 1990s.

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<sup>10</sup> The other two are the Malaysian Administrative Modernisation and Manpower Planning Unit (MAMPU) and the Anti-Corruption Agency (ACA).

INTAN tailors its training programmes as part of the reform mechanism and designs them to equip civil servants with not only the necessary knowledge and skills but also the essential values and mental orientation to perform their duties effectively (OECD, 1998). The competency-based human resources management advocated by the Knowledge-based Economy Masterplan has implications for the design of courses, workshops and seminars. Training programmes, as far as the Masterplan is concerned, should be geared to developing specific competencies, and development programmes for public personnel should be planned accordingly. Training institutes, on the other hand, should design courses at basic, intermediary and advanced levels to cater for different levels of requirements. This included designing a specific training cycle for each of the nineteen schemes of service. Furthermore, each civil servant should attend mandatory training programmes at least one week each year, to instil a continuous learning culture.

The Masterplan further highlights the importance of training by recommending that the support infrastructure for training in the public service be reinforced. Among the steps in this direction recommended by the plan were the establishment of training units at every Ministry and major agency, linking acquisition of skills and knowledge to annual performance assessment, and the creation of a budget code, independent of other activities, specifically for training.

With the aim of inculcating stronger thinking skills and a culture of innovation among public personnel, the Masterplan advocated a variety of training methods such as case studies and in-depth discussions. Finally, acknowledging to the linkage between knowledge acquisition and globalisation, the plan stressed the “great need to

enhance English language capacity in the civil service” (ISIS, 2002: p.147). As a measure to implement this recommendation, the plan suggested designating English language competency as an important competency besides expanding facilities for English language learning in government training institutions.

With this advent of the knowledge-based economy and the demand for a knowledge-based civil service, INTAN again customized its training programmes accordingly. Guided by the suggestions of the Knowledge-based Economy Masterplan, INTAN began designing special courses addressing particular competencies deemed important for each scheme of service under its purview. These courses were made mandatory for public servants. On completing these courses, they then sit for examinations that test their level of competence. Failure at any level would have implications for their salary increments, promotion, placement, and future training and development opportunities.

## **2.5 Conclusion**

The Malaysian government’s efforts to develop successful managers have so far followed the prevailing trend in management development endeavours, in providing training and educational opportunities through formal learning approaches. Recent research however, suggests that managers learn more effectively in informal, on-the-job settings, rather than those settings evident in many formal education and development programmes. Indeed, Tough (1979) suggested that about 70 percent of learning in adults takes place outside institutional frameworks. The focus on competencies can also be questioned, because competencies alone are no longer regarded as a sufficient criterion for success (Pedler et al., 2001).



Closely related to the learning environments are the associated forms of knowledge. Formalized learning is often associated with a form of knowledge called explicit knowledge. Drawing on Polanyi's (1966) distinction between explicit and tacit knowledge, it has been argued that tacit knowledge may be one important factor that distinguishes successful managers from others (Argyris, 1999; Wagner & Sternberg, 1987; Wenger et al., 2002). The nature of tacit knowledge and its association to the informal forms of learning, especially learning from experience, will be detailed further in Chapter 4.

If it is true that tacit knowledge is acquired in informal settings, on-the-job through a person's personal experience, the validity of the current training approaches is called into question. This in turn would have severe implications for management development efforts in the Malaysian public service. This issue needs to be addressed, given Malaysia's heavy reliance on its public service to overcome the challenges facing the nation. Even though many experts advised against direct government intervention into the economy<sup>11</sup>, the Malaysian government persists in continuing with its dual role of protecting the interests of Malays and in promoting the interests of the Malaysian economy (McKinnon, 1996).

Without an imminent change to the government's philosophy, the position of the Malaysian public service at the forefront of national development may not change much from the days when the nation gained its independence more than forty years ago. Although under the National Development Policy the government proclaimed

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<sup>11</sup> An example was the World Bank's negative perception of the extended role of state intervention in developing economies (McKinnon, 1996).

officially that the private sector was to take a leading role in the pursuit of economic growth, in actuality, the private sector in Malaysia was too weak to accept such responsibility. With the advent of globalisation and trade liberalizations, local private enterprises found it hard to compete against powerful international competitors and many have been relying too much on government help (Saifuddin, 2004). As one senior public service official said, "The task of leading the way in the transformation of Malaysia into a fully developed industrial country by the year 2020 lies with the civil service... The civil service must provide the leadership and the ideas, policies and programmes that will turn the national vision into a palpable reality" (McKinnon, 1996; p.45; Muhammad Rais, 1992; p.34). To enable the public service to fulfil this role effectively, future management development initiatives must take into consideration claims that most learning done by managers about managing does not come from organized learning providers and formal learning programmes (Mumford, 1997; Burgoyne & Hodgson, 1983; Cunningham & Dawes, 1997; Dawes et al., 1996). With this in mind, evidence favouring informal learning approaches and the debate between the formal against the informal learning approaches will be discussed in greater detail in Chapter 3.

# CHAPTER 3

## MANAGEMENT DEVELOPMENT AND ITS THEORETICAL UNDERPINNINGS

### 3.1 Introduction

The strategy of state-led economic development helped Malaysia to pursue rapid industrialization and socio-economic advancement (Jomo et al., 1995). This is typical of the strategy of state intervention in economic development followed in successful Newly Industrializing Countries (NICs) such as Hong Kong, Republic of Korea, Singapore, and Taiwan, where rapid growth was associated with effective government activism (World Bank, 1993; p.84). For Malaysia, the ability of the public service to initiate and facilitate change was, according to Siddiquee (2002), responsible for achieving their economic targets. Furthermore, he added that the government's policy of allocating large sums of money for educational facilities and the training of public servants locally and overseas has enabled public servants to be exposed to the latest trends and developments in administration and contributed to minimise their resistance to change.

In the previous chapter, it was shown that the Malaysian public service relied heavily in its management development efforts on training courses and further education. Furthermore, under a new initiative, the Malaysian public service is now looking at competencies as the basis for its human resource development in general and management development in particular. In its new scheme of service, the MRS, all public employees are required to develop competencies and pass competency assessment exams before being considered for promotion. Thus, there is a high

degree of reliance on formal learning approaches. This chapter will present evidence to suggest that formal learning alone is insufficient for the development of managers and argue for the inclusion of informal approaches to learning in the process of developing managers. It will also introduce the concept of learning styles, a construct mostly associated with learning in informal settings. It will be argued that it is significantly related to the accumulation of managerial tacit knowledge, a form of knowledge associated with successful managers and experts.

## **3.2 The Field of Management Development**

### **3.2.1 The Managerial Profession**

Management is a complex profession, which lacks a clear body of knowledge such as is associated with other professions like engineering or accountancy. Despite extensive literature there is still considerable ambiguity about the nature of the management role. This complexity and uncertainty affect the activities in management development, making the task of understanding management development and learning much more difficult (Watson, 2001). Martin (1998) attributed this complexity to the variety of practitioners in the field, who have very different views of what managers should do and how to develop the skills, knowledge and approaches needed for competence. However, there is broad agreement on the importance of managers to an organization. They command a central role in an organization (Carlzon, 1989) and have influence over other organizational members (Zaleznik, 1992). They are the frontline of any organization, facing an increasingly demanding and rapidly changing environment (Porter, 1990; Strassman, 1985). This calls for better managers with superior quality and ability to

manage organizations. Organizations are compelled to place a high priority in the development and training of their managers, and they spend heavily on management development and education activities. Many set up special training and development departments, while larger organizations even have their own training and development institutions. Others send their managers to an external training provider or outsource their needs by calling in consultants and experts to conduct internal programmes and classes. Armour (1998) and Phillips (1997) report the prominence of employer-sponsored training. Training providers commonly design formal training packages (Burgoyne & Reynolds, 1997).

As in the industries, governments too realized the need to develop their managerial competence as the demands for services from citizens increased in sophistication. Some established their own management training and development institutions in order not only to reduce the cost of training but also to have it tailor-made for their specific needs. Government involvement in training and development is not new, however. Most governments have some form of institutions to supplement the supply of training and development programmes in response to newly emerging problems and needs. These may include military and teacher training academies, administrative staff colleges, project-related training by donors, and regional or inter-governmental institutions (Samuel, 1983).

Increasing demand for training and development has also made the field appealing to private enterprise, and training and development has become an industry in its own right (e.g. Kirby and Harter, 2001; Regan, 1998). Because the principles behind most business endeavours are profit and cost-effectiveness, education and training is

now often treated as a form of commodity, much the same as the production of goods. This often results in a mindset which is geared towards catering for the masses, relying on traditional and established modes of product delivery through formal training programmes, when newer approaches designed to attend to individual needs are often called for (Argyris & Schön, 1974; Pantazis, 2002).

### **3.2.2 What is Management Development?**

One way of understanding management development is to look at its use. The interrelation between the demands on managers, the need and requirements development fulfils and the management development approaches can provide a glimpse of what management development is.

Viewed from an historical perspective, approaches to management development can be generally divided into three phases. The first phase was in the years after the second World War when behaviours contributing to efficient performance, rule conformity, cost reduction, and working within prescribed roles were valued most (Storey, 1994). At this time, organizations favoured planned training programmes with systematic development regimes for managers.

The second phase was defined by the increasing competition faced by organizations brought by expanding economies. At the same time, especially during the eighties, periods of recession brought a sense of uncertainty and insecurity to organizations. Managers during this period needed flexibility to react and adapt quickly and effectively (Garavan & McGuire, 2001), besides the ability to anticipate threats and opportunities. Management development therefore began to adopt a strategic

standpoint leaning towards organizational development. The strategy employed was to bring structure, attitude and value changes in organizations (Henderson et al., 1993). Management development was therefore used for a number of purposes: from culture change (Marsh, 1986) to organizational excellence (Alexander, 1987). This form of management development was reflected in Mumford's (1997) earlier definition: "management development is an attempt to improve managerial effectiveness through a planned and deliberate learning process" (pp.5-6).

A more recent phase was marked by the era of globalization. Competition is now much wider and larger in scale as multinational corporations penetrate national boundaries, threatening local companies which in the past enjoyed some sort of protection against "outsiders". Companies are now concerned with gaining competitive edge against others. Governments in many developing economies have reacted to these challenges by the deliberate and increased intrusion into economic matters. These pressures have also changed the conventional managerial paradigm. Merely equipping managers with sets of skills is now perceived as inadequate. Managers must now be transformed. This necessitates attention to managers at the individual level. Firms are therefore adopting new management development approaches such as self-development and action learning. Thus, knowledge in management development has been changed with these changing trends and perspectives.

### **3.2.2.1 Perspectives on Management Development**

There are two ways in which management development is viewed. One perspective is that management development exists within the broader context of management

learning, and that also includes management education (Burgoyne & Reynolds, 1997). Within this perspective, learning provided by educational institutions is usually associated with the term education, whereas learning within work organizations is associated with the term training and development. Fox (1997b) differentiated management education from management development by content, teaching methods and organization. In terms of content, management development tends to develop personal knowledge, repertoires and skills. Management education, on the other hand, is concerned with developing analytical and critical skills relevant to the theory of management. The range of methods employed by management development is wider compared to management education that utilized methods that are more traditional. Finally, the public education system is the biggest supplier to management education, whereas market forces determine most of management development's clients.

An alternative perspective is to view management development as the overarching field, covering both the education and training aspects (Mumford, 1997). Within this perspective, Peel (1984) differentiates management education from training by suggesting that management education usually involves courses that are of a longer duration than training courses. Despite these differences, both perspectives share a similar view in distinguishing between the two aspects of education and training/development. The current research is interested in this demarcation between management education and management training/development and will adopt the term management education when referring to learning provided by academic institutions striving to enhance managers' analytical and critical skills (Martin, 1998). The term management development is adopted when referring to learning that



takes place within work organizations. The term management learning is adopted to refer to all forms of management education, development and training.

Easterby-Smith & Thorpe (1997) investigated research traditions within management learning and divided them into the policy and operational levels in one dimension and the educational and corporate sector in the other (Table 3.1).

**Table 3.1: Research traditions within management learning**

	Educational Sector	Corporate Sector
Policy level	Policy research at the education sector	Policy research at the corporate sector
Operational level	Operational research at the education sector	Operational research at the corporate sector

Source: Easterby-Smith & Thorpe, 1997

As noted earlier, management learning associated with work organizations is more commonly termed as management development. Research in corporate management development is split into two levels: policy and operations. The lower right-hand quadrant of the above model concerns management development practices and implementation in work organizations. Activities within “corporate management development” at the operations level fall into two components: structural and developmental (Burgoyne, 1988; Burgoyne & Reynolds, 1997; p.14). Structural activities involve the actual tasks and roles a manager performs, whereas developmental activities involve the issues of change and development of a manager. Examples of research conducted within corporate management development at the operations level are, investigating natural learning at work, evaluation of corporate training methods, and research into the effectiveness of organizational management development (Easterby-Smith & Thorpe, 1997). On the other hand, corporate

management development at the policy level involves linking corporate policy implementation to the operational level management development activities.

The present research is located within the lower right-hand quadrant of the above model, focusing on management development practices and implementation in work organizations. A debate within corporate management development concerns the formal against informal settings in which development activities are conducted. Fox (1994) attested to the distinction between formal and informal forms of management and learning. This distinction results in the creation of a formal, explicit, and deliberate management as opposed to an informal management category. Furthermore, the associated learning processes can also be divided into the formal, explicit, and deliberate learning as opposed to the informal learning category.

### **3.3 The Formal-Informal Dichotomy**

Many notable authors have discussed learning and development in terms of formal and informal perspectives. Eraut (2000), for example, referred to non-formal approaches as those that are the opposite of formal learning, while Verner (1964) differentiated formal settings of learning from natural settings. In his discussion on life-long learning, Cropley (1979), on the other hand, distinguished between formal, non-formal, and informal learning systems as follows:

“The first is the formal system that includes schools, universities, and similar systematic and formal institutions. The second comprises experiences which are planned and deliberately “educational”, but which lie outside schools and related institutions... (The third is the) “system” of unplanned experiences through which people learn many useful things, although without necessarily seeking to learn, planning the learning experiences, or even necessarily being aware that they are engaged in learning” (p.110).

Spaulding's classification falls along a continuum of formal, on one extreme, to the non-formal and at the other extreme, informal. According to him:

"At one end of the spectrum are the relatively selected, closed, and highly competitive institutions called colleges and universities... At the other end of the life-long education spectrum are the mass media, libraries, information centres, and other sources of information from which people choose according to their interests, and which generally are nonprescriptive, non-competitive, and non-selective in terms of who can use them" (Spaulding, 1974, p. 102).

Marsick and Watkins (1992) made a distinction between formal and informal learning. To them:

"Formal learning is institutionally sponsored, classroom based or highly structured... (while informal learning) is not typically classroom-based or highly structured, and control of learning rests primarily in the hands of the learner" (p. 12).

Part of informal learning is incidental learning. The difference between the two is in the degree of intention. Incidental learning is "tacit, taken-for-granted, and implicit in assumptions and actions... is never planned or intentional, whereas informal learning can be planned or intentional" although both are "predominantly experiential and non-institutional" (ibid, p. 7).

Beckett and Hager (2002) notice that the formal perspective is the 'standard paradigm' that dominated thinking about learning. They claimed that this paradigm is flawed and argued in favour of informal learning, which they claimed to be organic or holistic; blending together the human intellect, values, emotions and practical activities. In sum, they believed that informal learning is more effective

than formal learning. The characteristics and relative methods of the two approaches will now be discussed.

### **3.4 The Formal Perspective of Management Development**

Quoting from the Training Services Agency (1977), Winterton & Winterton (1999) defined management development as:

“any attempt to improve managerial effectiveness through a planned and deliberate learning process” (p.1).

Within this perspective, the traditional approach of developing and educating managers by providing formal learning in organized, time-bounded and structured learning programmes is often the preferred approach (Fox, 1997b). Much of the work from this viewpoint was focused on the quest for managerial effectiveness. The competency movement leads the way in finding the special characteristics that will enhance the ability of managers to perform their job effectively.

#### **3.4.1 The Competency Movement**

Management development is primarily concerned with managerial effectiveness (Mumford, 1997; Winterton & Winterton, 1999) and this, some would argue, is contained in the notion of competence. Competence, therefore, is crucial as a body of knowledge for management development. Several lists have been published that claimed to represent qualities needed by managers (e.g. Boyatzis, 1982; Pedler, 2001; Winterton & Winterton, 1999). Pedler (2001) for instance, lists eleven qualities for an effective manager, ranging from commanding basic facts to self-knowledge. Boyatzis (1982), based on extensive empirical research, found eighteen

competency descriptors that can be grouped into four clusters: goal and action management, directing subordinates, human resource management, and leadership.

The notion of competence has appealed to many governments (Sadler-Smith et al., 2003) leading to several countries developing national level competency frameworks such as the Management Charter Initiative (MCI) in the United Kingdom (Burgoyne, 1993; Storey, 1994) and the Competency Standards Movement in Australia (Penington, 1993)<sup>1</sup>. These initiatives provide frameworks and guidelines, models and standards of performance for the development of identified competencies (Antonacopoulou & FitzGerald, 1996). The intention of such national frameworks was to achieve increased economic competitiveness (Horton, 2000) besides creating coherence in policy formulation and implementation that was mostly done in an ad hoc and incremental fashion (Bolam, 1995).

Calhoun et al., (2002) traced the origins of competency modelling to the works of Frederick Taylor, David McClelland and J. Flanagan. As early as in 1911, Taylor – the pioneer of scientific management – had been working on workflow and task analyses, providing what Garavan & McGuire (2001) called the philosophical roots of the competency movement. His work, grounded in the functional view of management, strove to find the best way to fulfil a task and was credited with the development of the competency approach (Grugulis, 1997; Sandberg, 2000). On the other hand, McClelland's work in human motivation and achievement attempted to identify patterns of behaviours, attitudes, and habits shared and demonstrated by high achievers. Meanwhile, Flanagan was known for developing the critical incident

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<sup>1</sup> It should be noted that some authors made a distinction between the terms competency and competences (for example see Winterton, 2002).

technique to identify crucial traits and skills for successful performance. These works became the foundation of later work on managerial competence.

The competency movement brought new purpose and direction to management development. Many writers emphasized competencies in defining management development (e.g. Mailick & Stumpf, 1998; Reeves et al., 1998; Woodall & Winstanley, 1998; Boam & Sparrow, 1992; Boyatzis, 1982; Spencer & Spencer, 1993) despite other theorists preferring a broader definition. Advocates of the competency movement found plenty of evidence in support of skill acquisition for managerial efficiency. Patterson et al., (1997) found that skill acquisition and development were the most influential part in the practice of human resource management and were great predictors of profitability and productivity. Winterton and Winterton (1997) analysed sixteen organizations in the United Kingdom and found that competence-based management development was significantly related to performance.

Competence-based management development emphasized the importance of identifying, developing and using characteristics deemed desirable for managerial behaviours (Du Gay et al., 1996; Loan-Clarke et al., 2000). However, Garavan & McGuire (2001) pointed out that an important requisite for development of managerial competencies is finding a fit to organizational objectives. Unless fitted into the broader organizational perspective, Vloeberghs (1998) argued, all personnel management initiatives would be meaningless. This led to organizations taking a

broader role in determining competency and skills acquisition for their employees and making it a part of their strategy.

The importance of competency-based management development is reflected in the increased body of literature linking it to organizational strategy, in terms of organizational change (Dubois, 1993), career planning (Hampl, 1983) or for the purposes of strategic re-orientations such as implementing mergers and takeovers, self-steering teams, and networking (Vloeberghs, 1998). An organization's market performance has been claimed to be determined by the way it develops and addresses skill gaps of its managers (Butler et al., 1991; Schuler & Jackson, 1987). Other evidence of management development attaining strategic level importance in organizations can be seen from formalized, written down statements of management development policies (Garavan, 1991) suggesting the development of managers in a deliberate and planned as opposed to an ad hoc approach.

This deliberate and planned intent toward competence acquisition resulted in serious attention to the implementation of training. This emphasis is not new, however. Development of competences has been the core purpose of training and development for a long time. As early as 1956, Herder stressed the importance of competency development when he suggested that management development initiatives should cater for the enhancement of three basic administrative skills: technical, human and conceptual.

An abundance of literature paints a picture of the complexity and treacherous conditions firms must endure in today's global environment. This means an increased repertoire of competencies is needed by managers if they are to perform effectively. Organizations recognized a need to take responsibility for the development of their managers. However, most relied primarily on training, identifying the competencies needed by their managers to perform effectively. Still entrenched within Taylorism's scientific management ideology, many organizations held to the maxim of developing people to their capabilities to do the task they have been given. Weisbord (1987) however disagreed with this approach by quoting what Henry Gantt said: "Whatever we do must be in accord with human nature. We cannot drive people; we must direct their development" (p. 42). These arguments tend to shift the focus towards learning instead of the provision of competencies through training.

### **3.4.2 Strategy and Learning**

Questioning whether individuals do actually learn from training, Antonacopoulou (1999) pointed out that focus should be on learning as an integral part of development. This shift in emphasis from training to learning was supported by arguments that what matters in training is what is brought back from the training to the workplace, in other words, what was actually learned by the individuals. Kirkpatrick pointed out "There may be a big difference between knowing principles and techniques and using them on the job" (1975, p. 10). Hence, Robinson and Robinson (1995) for example advocated a "shift from focusing on what people need to learn (training) to what they must do (performance)" (p. 7).



This change in perspective was influential on thinking about effective management development through various forms of learning: 'learning how to', 'learning by doing' and 'learning for' made their appearance in the literature (Rodwell, 1998). However, the organizational perspective continues to dominate debate in the area (Belcourt & Wright, 1996; Reid & Barrinton, 1997). A major response came in the concept of organizational learning, drawing on Kurt Lewin's work, which supports a new style of corporate leadership, one that encouraged group learning.

Proponents of this theory believed that all initiatives should be for the benefit of the organization and perceived learning as a strategy to achieve competitiveness (Bartlett & Ghoshal, 1998). Traditionally, organizations have utilized strategic management to generate rent (Liu, 2005) and it has become an important management tool (Campbell & Alexander, 1997). However, global considerations have affected most of the organization's traditional strategic thinking and decisions (David, 1995) largely due to the complex, interconnected, and unpredictable global competitive environment (Picken & Dess, 1997). Various other factors also put pressure on organizations to change (Marsick, 1988) and to plan goals and directions for the future (Redding & Catalanello, 1994). This calls for an improvement in the strategic planning process and organizational learning was seen as the key to meeting this need.

Acknowledging that organizations do learn and adapt (Fiol & Lyles, 1985), much effort was directed towards understanding how and why organizations learn and to

the ability for an organization to learn (Ribbens, 1997). Various strategies were also proposed to help achieve learning in organizations (King, 2001) and organizational learning was embraced as a fundamental and important element of an organization's strategic architecture (Kiernan, 1993). Redding & Catalanello (1994) urged organizations to take journeys of learning because only when their members have the capacity to learn would an organization be effective (Shrivastava, 1983), facilitating their pursuit of change (Finger & Woolis, 1994) and bringing competitive advantage (Liu, 2005). The learning approaches have attracted scholars in the field of strategy to research avenues to promote learning strategies (e.g. Slocum et al., 1994), establishing a natural environment for learning (Redding & Catalanello, 1994), and creating a conducive learning environment (Goh, 1998). Others try to find further organizational strategies, such as behavioural changes (McGill et al., 1992; Schein, 1993), for learning to occur.

Redding & Catalanello (1994) stressed the importance of learning at all three levels: individual, team and organization-wide. King (2001), on the other hand, proposed individual learning strategies as one option in achieving organizational learning. Goh (1998) believed that the building blocks are still the individual employees who learn and transfer the skills and knowledge acquired to the job and to others within the organization. Cohen and Bacdayan (1994) provide further support for this view, arguing that organizational ways of learning arise from individual ways of learning. There is a broad agreement in the organizational learning literature that individual learning contributes to organizational learning (Ribbens, 1997) of which individuals are the agents. Arguing that the concept of the learning organization would best operationalize learning, Scott-Ladd & Chan (2004) cited the work of Peter Senge

(1999) asserting that organizations *per se* cannot change or learn but that this must happen through individual employees.

Building from the individuals, learning moves up to higher levels - groups, departments, organizations and finally industries (Shrivastava, 1983). Fiol & Lyles (1985) contend that the sum of the collective learning is more than the sum of individual cognitions. Shared values and beliefs, as a set of tacit collective meaning, come from the interaction among individuals (Dixon, 1999) and produce behavioural norms in an organization (Picken & Dess, 1997). This collective learning then becomes the key for competitive advantage (McGill et al., 1992). In spite of this, Kline and Saunders (1993) stressed the importance of the human element as being integral to the success of organizational learning.

### **3.4.3 Learning Strategies**

The term learning strategies, often defined as 'the process by which information is obtained, stored retrieved and used' (Rubin, 1987a, p.29), can be traced back to studies of language learning (Rubin, 1975; Stern, 1975). Since then, the term has been adopted across many disciplines, ranging from educational psychology (Brown, 1978) to hypermedia (Liu & Reed, 1994). The original motivation for studying learning strategies arose from the desire to understand more about disadvantaged students in the classroom (Weinstein, 1988) from the perspective of how different behaviours influence the processing of information (Mayer, 1988). Whilst most research has focused on children and university students (Warr & Downing, 2000), there have also been studies of learning strategies associated with the adult learner (Weinstein, 1988). It is believed that learning strategies are more often associated

with formal learning (Holman et al., 1997; Warr & Downing, 2000). Gu (2003) supports this view by defining learning strategy as 'something used by students to accomplish learning' (p.4).

### **3.5 Criticisms of the Formal Approach**

The competency movement was framed within what is termed as the functionalist perspective of management development (Mabey, 2002). From this perspective, competence - the activity of highlighting capabilities managers need to perform effectively - was conceived as a strategic response to skills deficiencies in the organization (Kandola, 1996). This functionalist perspective provides solutions involving what are termed as formalised learning programmes. It isolate managers from their normal work environments to be treated through formalized training interventions for their deficiencies before being put back into their normal daily work routines.

Despite the changes that occurred within the formal perspective, the range of solutions undertaken within an organization such as in-house training courses and externally provided courses, seminars and conferences can still be broadly classified as formal. Admittedly, newer trends within the formal perspective prove that it is embracing broader approaches through the introduction of informal activities such as mentoring, coaching and company job rotation. Nevertheless, such initiatives still share the common characteristic of being planned and deliberate. There is, however, a wide range of literature that does not support this notion of learning.

The scepticism over the validity and effectiveness of intentional, formal learning approaches was directed largely to one of the most researched areas in management development: the quest for managerial effectiveness. This section will present arguments to show how the competency movement has been criticised for its lack of relevance (with regard to its relationship to performance), adequacy, and limitations, leading to recognition of a need “to embrace informal and accidental processes of learning” (Mumford, 1997).

Formal approaches to developing and educating managers are claimed to be flawed because they do not take individual differences into consideration (Argyris & Schön, 1974). Consequently, behaviour changes resulting from attendance on such courses do not last (Fleishman, 1953 cited in Burgoyne & Reynolds, 1997). Industrialists and even educationists often raise concerns and demand a more effective approach to the “static form of education, emphasizing memory and repetition” (Margerison, 1984; p.2). Lave and Wenger (1991), who argue in favour of situated learning approaches within communities of practice rather than more formal education and training through “schooling”, make the following points:

1. Schooling produces schooled adults, people who can talk about practice, instead of practitioners of some practice.
2. Schooling separates learning from practice.
3. Teaching and learning in schooling institutions is carried out by “classroom interaction” rather than learning by practical techniques such as observing and imitating.

Other researchers have shown that most learning done by managers about managing does not come from the organized learning providers and programmes (Burgoyne & Hodgson, 1983; Cunningham & Dawes, 1997; Mumford, 1997). Fox (1997b) posited that within the field of management learning, formal management education and development are just a small part of the learning process. He suggests that “most learning to manage, and managing to learn, occurs ‘on-job’ in tacit, culturally embedded ways through peoples’ work practices within organizations, groups and other communities of practice” (p 35). He stresses the significant benefits in being able to understand better the ‘tacit’ knowledge in organizations and proposes that trainers and developers first conduct “field-work” by engaging with the members of the organization that they intend to improve (Fox, 1997b). Similar findings were made by Dawes et al. (1996) whose research indicates that managers do not learn much about managing from the organized management learning environment, but instead pick it up from their day-to-day work.

Mumford (1997) also pointed out that formal management development efforts have not worked successfully in many organizations. He attributed this to the limitations of the formal settings that failed to create the “real-life” feel and concluded that formal management development is not sufficient. Hay (1990) claimed that competencies reduce complex activities such as management to a list of simple descriptions of behaviours. As such, the use of these lists of competencies will have a limiting effect on the development of managers.

The contribution of the competency movement towards development of managers cannot be disregarded. The extracted characteristics and traits needed by managers to

be efficient do at the least form a part of management knowledge. However, successful managers who are seen to perform their job with above average effectiveness irrespective of age and level (Burgoyne & Stuart, 1976) must surely have characteristics that transcend a list of descriptors labelled 'managerial competencies'. For Reed and Anthony (1992), this "narrow vocationalism" could overshadow interest in the more important aspects of "social, moral, political and ideological ingredients of managerial work and the form of educational experience most appropriate to their enhancement and development" (p. 601). Competencies can only bring so much to a manager who operates in an organization working "on the basis of power, calculation and politics" (Burgoyne & Reynolds, 1997; p.12). These criticisms brought Pedler et al. (2001) to conclude that there appears to be some kind of limitation to being competent:

"For people whose standards of work are well beyond the norm, the word 'competent' is an insult. Such people – and they are found in every field of life and work – deserve the accolade of artist, their work being a personal expression of their inner and outer qualities" (p.28).

It is the contention of this study that successful managers acquire their abilities not simply through formal development and education delivered through such things as competency frameworks, but perhaps more effectively, through informal sources.

### **3.5.1 On-the-Job, Informal Approaches**

The focus of management learning and development, therefore, seems to have been moving away from formal learning environments in recent years and this is evident from Mumford's (1994) modification to his earlier definition of management learning:

“to include *informal* and *accidental* processes, as well as those defined as planned and deliberate” (p.3, emphasis original).

This presents a new challenge for most training institutions, which focus their approach mostly on an established format of curriculum design and delivery methods, attending to the needs of the “masses”.

The response to the weakness of the functionalist view arises from alternative perspectives, among which the more prominent are the proponents of informal learning approaches. Informal learning emphasizes skill formation from various activities such as learning from experience, learning from mistakes, action centred learning, and learning by doing. The main distinction brought by this informal form of development is the embeddedness of its solutions in daily work routines. Proponents of this approach argued that knowledge and skills for management could not be learned deliberately (Mumford, 1987; Storey, 1994). Based on empirical work such as that of Mintzberg (1973) and Cunningham (1990), they claimed that real life management is much more complicated than is reflected in attempts to codify the set of necessary management knowledge.

A large body of research supports the idea that managers tend to learn more from their life experiences in their daily work and by observing other managers and colleagues than from management training programmes (Davies & Easterby-Smith, 1984; Dawes et al., 1996). Socialization to an organizational culture, for example, is best learned on the job (McCall et al., 1988), and for many less task-specific skills this may also be true. Supporting this notion is the resource-based view of human resource, which claims that on the job learning helps to embed learning into work



routines (Mueller, 1996; p.161). This same perspective also perceives an organization's rent generation as being dependent on senior manager self-development (Castanias & Helfat, 1991).

Informal activities, based on the above arguments, are as important as formal activities to the development of managers. Mumford (1997), in his extensive observations of managers and directors, discovered that they mostly associate their significant learning with "informal, not formal, experiences" (p.5). Terms associated with on-the-job or informal learning include 'implicit or unconscious learning' (Reber, 1967), 'situated learning' (Lave & Wenger, 1991), and 'experiential learning' (Kolb, 1984). Situated learning appeals to those working on team and group learning involving communities of practice. Experiential learning receives widespread support for its emphasis on understanding the whole person through their experience, thus providing more relevance to daily professional life (Burgoyne & Reynolds, 1997). Implicit learning, however, is constrained by its limited applicability to real-world situations (Atherton, 2002). Mumford (1997) for example, distanced his view of management development from those involving the unconscious through the following statement:

"...a great deal of my work had increasingly been on the ways in which managers could learn from opportunities at work in an unplanned, though admittedly thoughtful, way" (p.6).

### **3.6 Distinctions between Formal and Informal Learning**

The preceding arguments support the view that managers acquire their abilities not simply through formal development and education, but perhaps even more

effectively, through informal sources. The acquisition of managerial knowledge from unplanned activities in daily work routines has been a popular concept within the learning perspective.

Garavan & McGuire (2001) attributed much of the tensions surrounding the informal and formal perspectives to the two philosophical positions of developmental humanism and utilitarian instrumentalist. According to them, the developmental humanism philosophy viewed competencies as both “liberating and empowering” acting as “an equalising force in the context of workplace learning” (p. 145). It assumes that employees are committed and will work in harmony with the organization’s aims. As such, they suggested that the idea of self-control and self-regulation would suit the developmental humanism perspective. On the other hand, the utilitarian instrumentalist philosophy, as far as Garavan and McGuire is concerned, advocates the rational management of employees to achieve increased competitive advantage. Such organizations have tight management control and they determine competencies required for their employees, seeking a fit between organizational objectives and employee competencies. Much of the literature on competencies is written from this perspective.

Another useful way to frame the formal - informal distinction is within the modernist and post-modernist perspective. The modernist approach to management development came from the attempt to address shortcomings of a previous approach - the pre-modernist approach. Cunningham (1990) labelled the pre-modernist approach as being ad-hoc, informal, subjective, and based on trial and error learning.

Much of the focus was on the ability to lead an organization and the only deliberate attempt at development was through a system of apprenticeship.

The increasing recognition of the crucial role of managers in an organization led to higher priority on development of managers. The more systematic, top-down highly structured process of the modernist approach replaced the haphazard mode of the pre-modernist approach. The modernist approach utilized formal development methods, congruent to techniques developed in scientific management. Cunningham (1990) attributed the rise in the number of corporate training institutions and popular concepts such as systems of appraisal and programmes of core and optional training to the modernist perspective of management development. According to him, the modernist approach is concerned with instilling competence in managers.

Criticisms later emerged over this modernist approach, directed particularly towards the planned and deliberate aspects of management development. It was argued that there is more to developing managers than just these formalized forms. Management development then evolved to include other forms of development under a new approach - the post-modernist. To the post-modernists, the modernists rest on an instrumentalist and reductionism mentality. Cunningham (1990) argued that the post-modernists strive to transcend beyond just the acquisition of skills to a higher level of learning how to learn. The post-modernist approach to learning is decentralized, informal, and places a high emphasis on self-development and personal growth.

The modernist to post-modernist transition implies a shift of emphasis from a tutor-directed training to self-directed learning by individuals and groups in an institution (Rodwell, 1998). Learning gained prominence over provision of knowledge inculcated through training (Sambrook & Stewart, 2000). Within Bateson's (1972) categorization of learning orders, post-modernists can be classified as being concerned with second-order learning as opposed to first-order learning, which was the concern of the modernist approach. Moreover, this non-traditional, informal means of learning is closely associated with that of experts and successful people. It is more likely to result in a form of knowledge that distinguishes these experts and successful people from others, and is known as 'tacit knowledge' (Klemp & McClelland, 1986; Murphy & Wright, 1984; Nestor-Baker & Hoy, 2001; Tan & Libby, 1997; Wagner & Sternberg, 1985; Williams, 1991).

### **3.7 Framework for Analysis**

Sternberg's model of knowledge acquisition pathways (Sternberg et al., 2000), shown in Figure 3.1, provides a framework in which the modernist (formal) and post-modernist (informal) distinction can be represented. Drawing upon Tulving's (1972) work on the organization of memory in terms of episodic, semantic, and procedural memory, the model was originally presented to illustrate how tacit knowledge is symbolized cognitively in terms of the mental processes of encoding and storing information in and retrieving it from memory.

According to Sternberg, episodic memory is memory for specific, personally experienced events. On the other hand, semantic memory transcends particular

episodes and is meant for general impersonal knowledge. Procedural memory is the memory for specific behaviours and actions, memory for specific condition-action pairings that guide a person's actions in a given situation. It does not need the person to recall specific episodes in which the action was performed. The three memories: episodic, semantic, and procedural and the related paths of knowledge acquisition are shown in Figure 3.1. The bottom of the figure represents behavioural consequences of learning i.e. the output of the memory system.

There are three major pathways through the memory system. Pathway A in Figure 3.1 relates to the process where personal experiences are stored in episodic memory. Episodic memories could later be used to construct a more generalized knowledge as stored in procedural memory (path A<sub>1</sub>) or semantic memory (path A<sub>2</sub>). Behaviours, therefore, can be influenced by personal experience either directly through path A or indirectly after being encoded in the procedural memory (path C) or semantic memory (path B). Path B implies a direct acquisition of generalized knowledge inputted directly to the semantic memory and "most typically through a process of formal instruction" (Sternberg et al., 2000; p.115). Path C involves the process of knowledge acquisition either through personal experience (path C<sub>1</sub>) or directly from received knowledge (path C<sub>2</sub>) and stored into procedural memory. Knowledge stored in procedural memory is concerned with how to perform certain behaviours or tasks. Knowledge in procedural memory could be further encoded into general knowledge and stored in semantic memory (path C<sub>3</sub>). While experience-based knowledge influences behaviour through episodic and procedural memory, received knowledge influences behaviour through procedural and semantic memory.

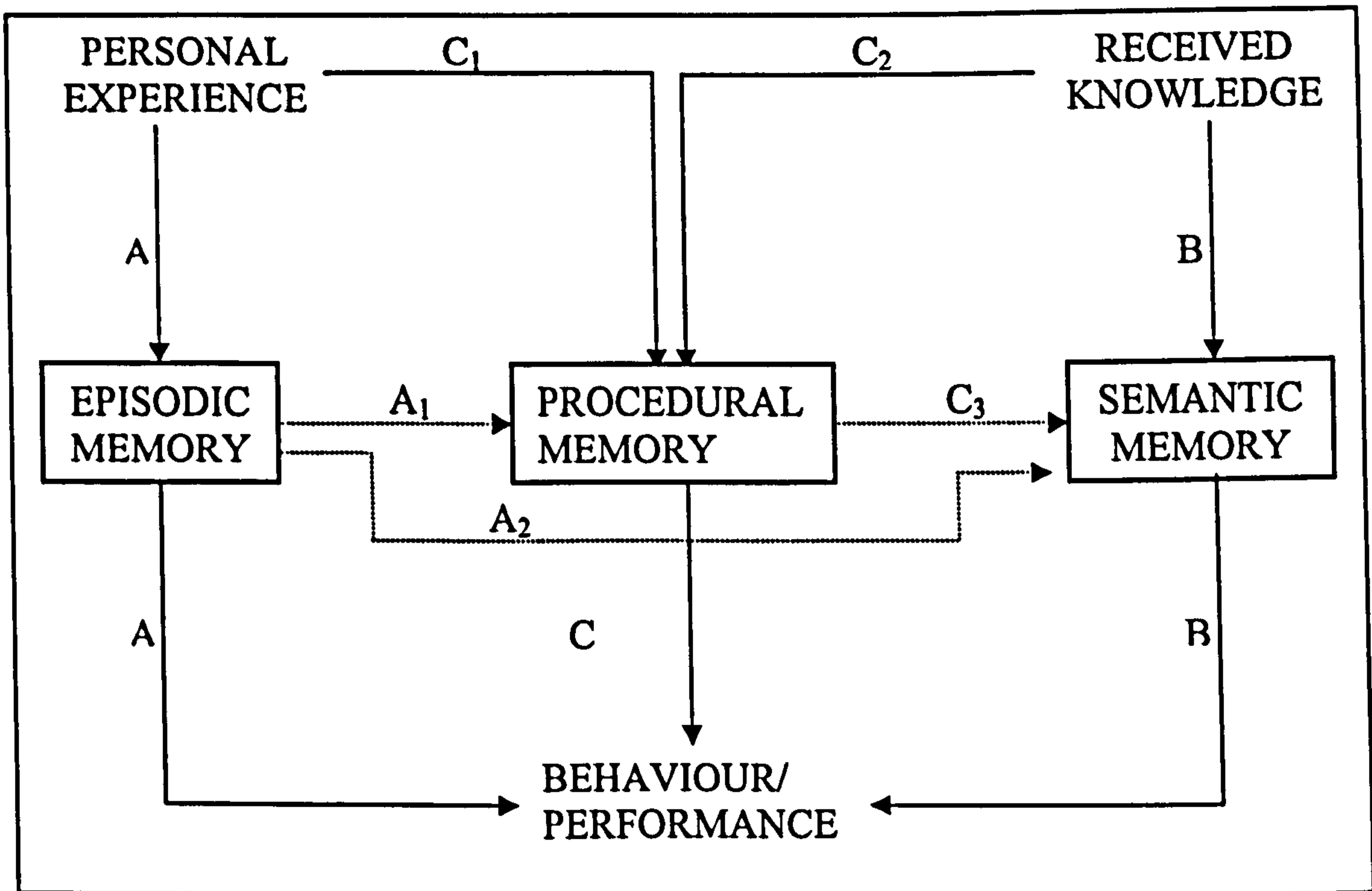


Figure 3.1: Memory structures and knowledge acquisition pathways in a cognitive model of tacit knowledge. (Source: Sternberg et al., 2000. p.114).

In the present research, this model is adopted as a framework to analyse the relationship between informal and formal learning environments and tacit knowledge. More specifically, the research explores the factors that may be responsible for variability in acquisition of tacit knowledge within this model. To do so, it approaches this model from the learning perspective. Baumard (1999) draws attention to the importance of individuals' pre-established cognitive patterns that uniquely filter incoming information, thereby resulting in selective encoding and combination processes. It has been known for some time now that individuals differ in the way they perceive, conceptualise, organise and process information (Messick, 1976), and these differences, referred to as cognitive style, depend on several attributes unique to the individual.

According to Sternberg, the top of Figure 3.1 represents the stimulus environment, i.e. the source of inputs to the memory system. The two input environments are personal experience and received knowledge. Sternberg distinguished between the two by the support from direct instruction that each received. Knowledge acquired from personal experience (top left-hand of the model), according to Sternberg, was not supported by direct instruction. This characteristic prevails in most learning that occurs in informal settings, where learners have to rely on their own capability for its acquisition. On the other hand, received knowledge (top right-hand of the model) would most probably come from someone else. This entails that the knowledge would have been processed and delivered to the learner in what Sternberg termed as having support from direct instruction. This reflects most of the learning that takes place in formal settings.

It was argued earlier that learning from informal means could result in a tacit form of knowledge. In this model, procedural memory bears relevance to tacit knowledge because tacit knowledge is a subset of procedural knowledge. Tacit knowledge is believed to be acquired through personal experience and a subset of procedural knowledge depicted by paths  $A_1$  or  $C_1$  in this model. This knowledge, not supported by direct instruction, may well lead to a performance advantage for the individual because “it is likely that some individuals will fail to acquire it” (Sternberg et al., 2000; p.117). There is only very limited understanding, however, of why differences in the level and content of tacit knowledge occur across individuals who appear to have similar abilities (Hedlund et al., 2001; Sternberg et al., 1993; Sternberg & Wagner, 1993; Wagner & Sternberg, 1985). One reason may simply be that rarely do individuals go through entirely the same experience. However, when individuals do

go through very similar experiences, they may learn from those experiences in entirely different ways, thereby leading to differences in acquired knowledge. There is widespread evidence to suggest that this may be due to the different *learning styles* of individuals (Kolb, 1984) because when learners are matched with environments that complement their unique learning styles, they achieve significantly higher learning outcomes (Dunn & Griggs, 2003). Learning style is believed to represent the interface between cognitive style and the external learning environment, and hence contextualises individual differences in learning (Sadler-Smith, 2001).

Learning styles have been defined as peoples' consistent ways of responding to and using stimuli in the context of learning (Claxton & Ralston, 1978). The concept evolved as an outgrowth of interests in cognitive styles (Jonassen & Grabowski, 1993), defined by Messick (1984) as "characteristic self-consistencies in information processing that develop in congenial ways around underlying personality trends" (p. 61). Learning styles have been acknowledged as lying "...at the interface between abilities, on the one hand, and personality, on the other" (Sternberg & Grigorenko, 2001b, p.2).

The above argument provides a linkage between learning styles and tacit knowledge. This line of argument also places learning styles as being more prevalent in informal learning settings within the above model. It can be said that learning styles operate at a lower level of consciousness by their nature of being habitual (Sternberg & Grigorenko, 2001a) and they constitute a person's preference to do things, irrespective of their ability to do them (Zhang, 2001). Learning strategies, on the



other hand, would operate at a much higher level of consciousness compared to learning styles. This would place learning strategies as being more prevalent within formal learning settings. Both learning styles and learning strategies and their relationship to other variables will be discussed in greater detail in Chapter 4. In light of those arguments, it is expected in the present research that learning strategies would have no influence on the acquisition of tacit knowledge.

### **3.8 Conclusion**

Management development has always been focused towards two components: the individual and the organization (Vloeberghs, 1998). The formal perspective, framed within the modernist, utilitarian instrumentalist philosophy, has approached management development from the organizational perspective. All individual endeavours were perceived as inappropriate unless fitted into the larger organizational and environmental settings (Garavan & McGuire, 2001).

Organizations, under the influence of this perspective, made huge investments to equip their managers with the necessary knowledge and skills to be efficient and successful. These, however, were often little more than acts of faith, especially in light of challenging evidence that most managers associate their significant learning with informal, not formal, experiences (Mumford, 1997). Increasing criticism was levelled against the formal learning environments prevalent in most institutional settings, with claims that what managers actually learn is derived from their own experience 'on the job'. The idea that explicitly extracted competencies are the target every manager should aim for to improve their effectiveness is also challenged,

because such competencies are no longer regarded as sufficient criteria for success (Pedler et al., 2001).

One factor contributing to the emergence of alternative approaches was the critique of existing training provision, which considered traditional off-site training courses as problematic (Rodwell, 1998). Significant emphasis has therefore been attached to the importance of helping managers to see knowledge as a social phenomenon and emergent theories include the theory of 'Situated Learning' (Lave & Wenger, 1991), which emphasises the interaction between individual learning, practice and everyday work tasks, and the theory of Communities of Practice (Brown & Duguid, 1991; Wenger, 1999) which stresses the term community and social relationships around the learner. The notions of the reflective practitioner (Schön, 1983), the diversity of learning styles (Honey & Mumford, 1986), experiential learning (Kolb, 1984), the learning organisation (Senge, 1999) and action learning through job-related problem-solving activities (Revans, 1982) have for the past three decades widely influenced the field of Management Development on effective professional learning and contextual organisational development (Burgoyne et al., 1978; Boydell, 1985).

This criticism does not mean that institutionalized learning is now irrelevant, but as Lave and Wenger (1991) remind us, formal "schooling" has endemic problems that can be better understood by contrasting it to informal learning that takes place on the job. Essentially, however, the contribution of informal learning as a significant and valid component in the overall learning process does need to be more widely

appreciated, and the fusion of both forms is needed for professional development (Boreham, 2002; Collin & Tynjala, 2003).

It is the contention of the present research that learning from informal means, especially learning from personal experiences on-the-job would result in tacit knowledge, which may be one important factor that distinguishes successful managers from others (Argyris, 1999; Wagner & Sternberg, 1987; Wenger et al., 2002). Tacit knowledge is often regarded as a product of learning from experience that affects performance in real-world settings (Nonaka & Takeuchi, 1995; Sternberg & Wagner, 1986). As such, it is likely that a range of individual differences such as intelligence, personality, prior knowledge, and other psychological constructs such as stylistic preferences for different ways of learning from experience will have a significant impact on the knowledge acquisition process. It follows, therefore, that to encourage acquisition of tacit knowledge, management development providers need to reassess their roles from being providers of skills and theory, to being facilitators of knowledge acquisition.

As previously stated, this study is concerned with exploring the possibility that the level of acquired managerial tacit knowledge may be influenced by managers' learning styles. It is also concerned with enhancing our understanding of how the extent to which their styles are consonant with the context of their work environment affects tacit knowledge acquisition. Having established the relationship between learning styles, informal learning environments and tacit knowledge in this chapter, the next chapter will discuss tacit knowledge, the construct at the centre of the

present research, in greater detail. The relationship between tacit knowledge and learning from experience will also be established.

## CHAPTER 4

### TACIT KNOWLEDGE IN THE PROFESSIONS

#### 4.1 Introduction

In the previous chapter, it was argued that formal learning alone is insufficient for the development of managers. In that chapter, the need to attend to informal forms of learning was linked to a form of knowledge mostly associated with experts and successful people; *tacit knowledge*.

The recognition of tacit knowledge as an essential element for expertise (e.g. Bereiter, 2002; Eraut, 2000), reflective practice (e.g. Schön, 1983), and competitive advantage (Prahalad & Hamel, 1990) have been well noted. Not only has it been shown to be important for the success of individuals (Argyris, 1999; Nestor-Baker, 1999; Wagner & Sternberg, 1985), but it is also important for organizations (Baumard, 1999; Hall, 1993; Lubit, 2001; Prahalad & Hamel, 1990). Tacit knowledge is believed to be a product of learning from experience that affects performance in real world settings (Nonaka & Takeuchi, 1995; Sternberg & Wagner, 1993), yet not much is understood about how this knowledge is actually acquired. Furthermore, the nature of the relationship between tacit knowledge and experience has not been fully established. A major question associated with the present research is whether there is any difference in the way that successful managers learn from experience compared with those that are less successful. It is possible that a range of individual differences such as intelligence, personality, prior knowledge, and psychological constructs such as cognitive style may have some impact on the knowledge acquisition process. This chapter aims to explore the reason for the

differences in tacit knowledge among individuals, especially between the more successful people and the others. This is done by reviewing the literature on tacit knowledge and its acquisition from the learning perspective.

## **4.2 Tacit Knowledge: Origin, Nature, and Characteristics**

Our current understanding of the concept of tacit knowledge can be attributed to the work of authors such as Baumard (1999), Collins (2001), Janik (1988), Neisser (1976), Nonaka & Takeuchi (1995), Reber (1989), Schön (1983), Scribner (1986), Simon (1973), von Krogh & Roos (1995), and Wagner & Sternberg (1986). They approach the concept from a multitude of disciplines including psychology, philosophy, economy, artificial intelligence, organizational studies, knowledge management, and literature.

### **4.2.1 Origins of Tacit Knowledge**

In spite of several variations in their construction of the concept tacit knowledge, a common thread among the authors mentioned above is their attribution of the origin of the construct to the science philosopher Michael Polanyi who describes it in his famous remark, “we can know more than we can tell” (1966, p4). To Horvath (1999), the theoretical foundation for tacit knowledge was laid by Polanyi’s treatise on personal knowledge in 1973. Baumard (1999), however, traces its history back much further to the ancient Greeks in *phronesis*. He describes it as the practical aspects of knowledge, the result of experience that cannot easily be shared, as knowledge that is personal, profound, non-scientific and “generated in the intimacy of lived experience” (p.53). Works by Neisser on ecological psychology in 1976 and Schön

on reflective practice in 1983 (Forsythe et al. 1998) provide a more contemporary perspective on tacit knowledge. Sternberg's work (e.g. Sternberg et al., 1993; Sternberg & Grigorenko, 2001a; Wagner & Sternberg, 1985) shifted the investigation of tacit knowledge out of the laboratory environment into the world of applied social science (Horvath, 1999).

#### **4.2.2 Types and Components of Tacit Knowledge**

Nonaka (1994; Nonaka & Takeuchi, 1995) holds that there are two types of tacit knowledge: technical tacit knowledge and cognitive tacit knowledge. Technical tacit knowledge is created through actions and needs to be experienced to be learned and as such, does not need language as the intermediary. In the technical dimension, the term "know-how" is commonly used to describe the skills and crafts acquired in relation to mastery of work (Collin & Tynjala, 2003; Nonaka, 1994). Expertise is associated with this technical dimension of tacit knowledge; the ability to demonstrate flawless execution of tasks yet finding difficulty in articulating the principles behind it (Baumard, 1999).

Mental models, perspectives and beliefs make up the cognitive component and are deeply ingrained in the mind to the extent that they exist at the subconscious level and affect how individuals perceived the world (Nonaka, 1996). These pre-established cognitive patterns will act as a filter to incoming information, resulting in the formation of knowledge that is unique to an individual (Baumard, 1999). Cognitive tacit knowledge can be transmitted through interaction or socialization (informal) involving the use of language.

Choo (1998), along the same line as Nonaka, classifies tacit knowledge into cognitive and technical components. The individual/collective perspective also influenced his stance on tacit knowledge. Individual tacit knowledge is knowledge that is acquired through experience, context-specific and action oriented. Choo, however, contended that there is also another form of tacit knowledge which he called “collective tacit knowledge”, accrued by virtue of shared practices and tacit understandings in groups that work together (pp.118-119).

Baumard (1999) also shares the same view as Nonaka but added that besides tacit knowledge there exists another form of organizational knowledge that cannot be articulated: implicit knowledge. Implicit knowledge is known and can be explicated, but this rarely happens because knowledge is often what lies behind a trade secret.

Holding a slightly different view is Janik (1988) who identified tacit knowledge as knowledge that is either not yet put into words or knowledge that is inexpressible in words. Knowledge that is not yet put into words remains tacit, perhaps due to secrecy and power, or perhaps because no one has bothered to explicate it, or because the knowledge is a presupposition held by all. Knowledge that is inexpressible in words is often acquired by rule-following behaviours and sensuous experiences like smell and taste. In a similar vein, Scharmer (2000) addresses tacit knowledge as embodied tacit knowledge and “not-yet-embodied” tacit knowledge. Embodied tacit knowledge is embedded and embodied in everyday practices while the “not-yet-embodied” tacit knowledge is based on imagination and aesthetic experience.



Collins (2001) studied tacit knowledge in scientists performing experiments and from there defined tacit knowledge as:

“knowledge or abilities that can be passed between scientists by personal contact but cannot be, or have not been, set out or passed on in formulae, diagrams, or verbal descriptions and instructions for action” (p.72).

He derived five types of tacit knowledge in relation to this study:

1. Concealed knowledge - knowledge that is concealed either by intention as in trade secret or unintentionally, if the person himself/herself is not aware of its existence
2. Mismatched salience - when different groups focus on different aspects of the problem because they are not observing each other's work
3. Ostensive knowledge - knowledge that words or drawings cannot describe but that can be expressed by means of showing and pointing
4. Unrecognized knowledge – imitation of critical actions by observing, without either party realizing its importance
5. Uncognizable knowledge - knowledge typical in language.

Wagner & Sternberg's (1986) perspective on tacit knowledge is rooted in the concept of practical intelligence; thinking that solves real-life problems (Scribner, 1986). Most of their research was practical in nature, with synonymous terms such as real-world, real-life and everyday used in many of their writings. Wagner defines tacit knowledge as “work-related practical know-how that usually is not openly expressed or stated, and that usually is not directly taught” (1993, p19). They did not, however, dissect the concept in the way other authors discussed above did, and have been criticized (e.g. Gourlay, 2002) for the way they defined the concept merely by

reference to a dictionary<sup>1</sup>. Nevertheless, Sternberg and his group of researchers conducted empirical studies and from there made inferences on tacit knowledge. They concluded that tacit knowledge is characterized by three main features (Sternberg et al., 2000; Sternberg & Horvath, 1999) as follows:

1. First, tacit knowledge is acquired with little help from others, implying that tacit knowledge is grounded in personal experience. For most people, they know more than they can express because their knowledge (tacit) is so grounded in their experience that it cannot be fully expressed.
2. Second, tacit knowledge has practical value in use in that it is more instrumental in achieving a person's goal than knowledge based on someone else's experience.
3. Finally, tacit knowledge is procedural in structure. Anderson (1983) distinguishes between procedural knowledge: knowledge about how to do something and declarative knowledge: knowledge about something. Declarative knowledge is consciously formed, controlled and articulable, while procedural knowledge is identified as unconscious with automatic learning which guides actions and decisions without being in our field of consciousness (Anderson, 1983; Reber & Lewis, 1977). Inferring from Anderson's work, Sternberg & Grigorenko (2001a) view all tacit knowledge as a subset of procedural knowledge.

A common theme running through the interpretations of tacit knowledge among the authors described above is that they all agree on the personal nature of tacit knowledge. Where they differ is in their views on the explicability and on the individual/collective dimension of tacit knowledge.

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<sup>1</sup> Wagner & Sternberg (1985) refer to the Oxford English Dictionary (1933) for the definition of 'tacit' as something "not openly expressed or stated".

### 4.2.3 Explicability of Tacit Knowledge

An important issue that has been debated in discussions of tacit knowledge is the ability to explicate it. Baumard (1999) views tacit knowledge as inarticulable and argues that if it is explicated or codified, its value as a tacit resource will be lost. Gourlay (2002) in analysing Polanyi's writings also concluded that there are aspects of tacit knowledge that can never be made explicit. He pointed to Polanyi's argument that even if all other experiences have been made explicit, the "sensory quality" of an experience will remain inarticulable (Polanyi, 1968; p.32). More recently, Collins (2001) grouped tacit knowledge into three different categories in terms of explicability: motor-skills, the rules-regress model and "forms of life". He argued that both motor-skills and the rules-regress model could be captured through advances in neural net computing, but this is not so for the "forms of life" types of tacit knowledge because this involves human socialization which computers cannot simulate. Janik (1988) subscribed to a dual view of tacit knowledge: that which can (or has yet to) be expressed and that which can never be expressed. Nonaka and Takeuchi (1995) simply hold that tacit knowledge is hard to articulate but they did not indicate any form of tacit knowledge that is totally inarticulable, and nor did Sternberg (1985). Indeed, Wagner and Sternberg (1987) meticulously designed an instrument to simulate specific incidents in the workplace that act as observable indicators of tacit knowledge, thus mitigating the problems of articulation, to a degree. Spender (1996) views tacit knowledge as explicable or at least "not yet explicated" (p.58).

#### **4.2.4 The Individual/Collective Dimension of Tacit Knowledge**

Another pertinent issue in any literature on tacit knowledge is whether it is an individual characteristic or a combination of individual and collective. Nonaka & Takeuchi (1995) see it as a personal form of knowledge, though they agree that groups may have some form of shared tacit knowledge. Choo (1998) also sees tacit knowledge as located in individuals as well as in groups. Von Krogh & Roos (1995), however, totally rejected the idea of collective tacit knowledge by firmly arguing that tacit knowledge is an entirely individual trait. Sternberg (1985) did not specifically address this issue, but most of his research is focused entirely at the individual level. Referring to Polanyi's (1966) description of how the "sensory quality" is attached to tacit knowledge, it would seem justifiable to assume that tacit knowledge is a characteristic of the individual, but that a collective dimension may be derived from a number of individuals.

#### **4.2.5 Other Characteristics of Tacit Knowledge**

Other contributions add to the understanding of tacit knowledge by identifying the distinguishing characteristics that help define it. It is knowledge that people do not know they have (Forsythe et al., 1998), resisting articulation or introspection (Cooper & Sawaf, 1996; Morgan, 1986). Tacit knowledge is context-dependent on a given situation or class of situations (Sternberg & Grigorenko, 2001a) and is usually found embedded in stories practitioners tell about their experiences. Although tacit knowledge may be considered by some to defy articulation, others consider it to be measurable (e.g. Ceci & Liker, 1986; Forsythe et al., 1998; Sternberg & Grigorenko, 2001a). It cannot be understood through direct articulation, however, due to its tacit

nature, but it must be inferred from actions and statements (Forsythe, et al., 1998). Sternberg and his group of researchers, developed several inventories to measure tacit knowledge in a number of domains which have been proven to be valid and effective (Wagner, 1987; Wagner & Sternberg, 1985).

Tacit knowledge acquisition happens in the real world under time and conditional constraints and influenced by multiple factors (Patel et al., 1999). Citing the work of Reber, Baumard (1999) indicates that human beings are capable of acquiring complex knowledge without being aware of it. However, underlying this capability is the need and ability to observe and learn (Minstrell, 1999). Tacit knowledge is best acquired in conditions or situations that are unusual (Marchant & Robinson, 1999) and where the environment encourages inquiry and constructive criticism of ideas (Minstrell, 1999). Personal contact methods such as apprenticeships are also recommended for imparting tacit knowledge, although transmission through the use of “rich modes of discourse” (Choo, 1998: p.117) such as story telling, metaphors and analogies is also possible.

Nevertheless, it is important to note that the use of tacit knowledge is dependent on the individual’s retention ability and this fact may impair the relevance of the knowledge in different situations (Cimino, 1999). There is also a social dimension in the acquisition of tacit knowledge. Professionals working alone have been shown to have a much-limited ability to acquire tacit knowledge (Minstrell, 1999) and knowing the right person from whom to acquire it is critical (Hatsopoulos & Hatsopoulos, 1999).

### **4.3 Tacit Knowledge in the Professions**

There has been a substantial amount of research into the nature of tacit knowledge in a variety of professions such as nursing (Benner & Tanner, 1987; Eraut, 1994; Herbig et al., 2001), education (Almeida, 1994; Minstrell, 1999; Nestor-Baker & Hoy, 2001), medicine (Cimino, 1999; Patel *et al.*, 1999), law and accounting (Marchant & Robinson, 1999; Tan and Libby, 1997). In addition, several works on expertise (e.g. Bereiter and Scardamalia, 1992; Chi et al., 1988; Leithwood and Steinbach, 1995; Reuber, 1990) also provide a valuable insight into the working of tacit knowledge in these various professions.

Sternberg's work into the nature of tacit knowledge is particularly noteworthy (e.g. Sternberg et al., 1993; Sternberg et al., 2000; Sternberg & Grigorenko, 2001a; Sternberg & Wagner, 1993; Wagner & Sternberg, 1985; Wagner & Sternberg, 1986; Wagner & Sternberg, 1987) because it provides a framework and a sound methodological basis from which tacit knowledge can be studied. These studies have resulted in the development of inventories specifically aimed at furthering our understanding of tacit knowledge across a range of professions.

#### **4.3.1 Tacit Knowledge Within The Research on Practical Intelligence**

Sternberg's work involves using tacit knowledge as a construct and measure to promote a form of intelligence he called practical intelligence. The idea of practical intelligence can be inferred from Neisser et al's (1996) definition of intelligence as the ability to adapt effectively to the environment and to learn from experience. This definition reflects a practical perspective on intelligence that is similar to Sternberg's

(1982) definition of intelligence as an adaptive behaviour aimed at a certain objective. Sternberg's triarchic theory of intelligence, of which practical intelligence forms a part, evolved as a result of a broader conceptualization of intelligence (Frederiksen, 1986), that in the beginning was dominated by the proponents of a single construct of general intelligence (often denoted by the symbol *g*). Proponents of practical intelligence based their arguments on the inability of the general intelligence model to account for aspects of intelligence other than those that are academic in nature (Frederiksen, 1986; Neisser, 1976). However, Sternberg's proposition on practical intelligence, which attempted to discount the role of *g* in real-world situations, drew strong criticisms from the proponents of *g* (e.g. Barrett & Depinet, 1991; Eysenck, 1982; Jensen, 1993; Ree & Earles, 1993).

In general, there are two camps in the theory of intelligence: those who believe in a single construct of general intelligence, and those who believe in many different forms of intelligence. A branch in the study of intelligence is concerned with analyzing factors that influence performance in work (e.g. Bereiter & Scardamalia, 1992; Ceci & Liker, 1986; Lave et al., 1984; Patel et al., 1999). Within the context of such research, the notion of general and practical intelligence has dominated the literature. General intelligence has been claimed to be the best predictor of performance and learning (Ree et al., 1994; Schmidt & Hunter, 1998). It was also claimed to provide a valuable selection technique (Ree & Earles, 1992) to identify individuals who can continually learn and adapt to unpredictable and changing environments (Snow & Snell, 1993). Eysenck (1982) for instance claimed that besides conspicuously predicting academic intelligence, intelligence quotient (IQ)

tests are also able to predict certain aspects of non-academic intelligence (Eysenck, 1982).

Critics of *g*, however, claim that there is some “overestimation” in the measures of *g* (Wagner & Sternberg, 1985). Ceci & Liker (1986) argue that there is evidence of discrepancies between IQ levels and expertise in everyday affairs that cannot be ignored. They suggest that Eysenck (1982) did not provide enough scientific evidence to prove the relationship between IQ measures and non-academic intelligence (Ceci & Liker, 1986). Sternberg et al. (1993) cite evidence from many research studies that individuals with low IQ scores can exhibit significant intelligence in other areas, and attributes this to the fact that intelligent behaviour involves multiple forms of intelligence (Sternberg & Berg, 1987). Many have claimed that measures of general intelligence actually measure academic intelligence (Neisser, 1976; Sternberg & Wagner, Preface, 1986). As Frederiksen (1986) concluded, the problem with *g* is not in the concept itself but in the limited approach to examining it, especially from the psychometric perspective, where intelligence tests were predominantly academic in nature.

Willis & Schaie (1993) add to this argument by drawing a distinction between the mechanics of intelligence and the pragmatics of intelligence whereby the former is concerned with “basic mental abilities and processes” (p.37) and the latter is concerned with practical cognition in everyday problem-solving. The impact of schooling (which includes other formal education as well) on intelligence has been studied by many researchers. Cole & Scribner (1974) showed the effect of formal schooling on the whole mode of cognition. They contended that formal schooling has



played a crucial role in developing modes of cognition in most individuals but they also stressed that these modes of cognition are mostly, if not entirely, dedicated to success at school. Nevertheless, the modes of cognition that have been developed to meet the need of academic success are not sufficient for many real-world challenges, which require the development of specific styles of cognition catering to the practicality of daily life (Ceci & Liker, 1986). Formal problem solving can be understood just from its structures and mental representations, but practical problem solving, which comprises most of these real-world challenges, is more complex in that it incorporates environmental factors, as well as the problem-solvers' motivation (Scribner, 1986). Additionally, the various everyday practical problems require solutions over and above those produced by competence in basic abilities, to include a different combination of cognitive abilities and processes (Willis & Schaie, 1993).

A mode of cognition that is associated with practicality is situated cognition. Situated cognition is concerned with the understanding of human knowledge and problem solving capability through daily practice in certain contextualized settings (Clancey, 1997). The situated cognition perspective provides an answer to questions raised in controlled 'laboratory' research on cognition through a variety of studies that have showed substantial differences in cognitive capabilities in individuals between the natural and laboratory setting. Situated cognition added the "here and now" (Leonard & Sensiper, 1998; p.113) dimension to practical cognition. The concept of alternative modes of cognition such as situated cognition has resulted in the redirection from conventional models of intelligence to practical intelligence in the endeavour to understand better the predictors of practical, everyday performance (Frederiksen, 1986). In addition, this provides a demarcation of practical intelligence from the

various intelligences, and in particular, general or academic intelligence as the construct represented by practical intelligence is different from the construct in the other forms of intelligence (Ceci & Liker, 1986). It also adds a practical/theoretical distinction of thinking to previous dichotomous schemes for organizing cognitive phenomena, such as Freud's (1900) primary/secondary distinction, Levy-Bruhl's (1910) logical/allogical and Vygotsky's (1962) spontaneous/scientific concept (cited in Scribner, 1986).

The preceding debate has certain implications for the current research, since this research is developed within Sternberg's conception of tacit knowledge. Despite the above arguments made for practical intelligence, it still receives fierce criticisms from the proponents of *g*. The debate will rage on with more criticisms and rebuttals (see Gottfredson, 2003; Gottfredson, 2003b; Sternberg, 2003). However, the main theme of the debate is whether differences in tacit knowledge reflect mostly differences in practical intelligence, or differences in *g*, as claimed by Gottfredson (2003b). Since the current research is only concerned with understanding the underlying factors that influence the content and level of tacit knowledge, the above debate is outside the scope of this research.

Sternberg never actually discounted the influence of *g* in predicting job performance; what he suggests is that practical intelligence predicts job performance over and above that predicted by *g* (Sternberg & Grigorenko, 2001a). In this sense, practical intelligence acts as a value-added factor, albeit substantial, to *g*. Furthermore, since *g* is a rather stable trait and genetically-influenced, its interest to managerial development is rather limited compared with tacit knowledge, which is developed

through a manager's experience. Secondly, intelligence is related to intelligent people, who comprise a minority of the population, but most research involving real-world occupational settings would encompass the 'normal' majority of the population in order to generalize findings. Third, the concern of this research is with the measurement of tacit knowledge. Gottfredson (2003) claimed that crystallized intelligence tests, such as the Vocabulary and Comprehension subtests of the Wechsler Intelligence Scale for Children (WISC), Wechsler Adult Intelligence Scale (WAIS), and Stanford Binet IQ tests do actually measure tacit knowledge. However, the issue here is in using these IQ tests in managerial settings. IQ tests would be perceived as rather intrusive by managers who have been working for many years and this would make it difficult to administer the test to them, compared to the job related scenarios used in tacit knowledge inventories developed by Wagner & Sternberg (see Sternberg et al., 2000).

#### **4.3.2 Tacit Knowledge in the Study on Expertise**

It is common to find research on tacit knowledge, practical intelligence and cognition in the domains of expertise (e.g. Bereiter & Scardamalia, 1992; Ceci & Liker, 1986; Patel et al., 1999). Puckett et al. (1993) in citing Rybash et al. (1986) suggest, "...cognition is encapsulated within domains of expertise" (p9). Thus, expert-novice comparison (e.g. Bereiter & Scardamalia, 1992; Ceci & Liker, 1986; Salthouse, 1996; Sternberg & Grigorenko, 2001a) is one of the most common approaches utilized by researchers in investigating everyday cognition. Willis & Schaie (1993) however argued that expert-novice comparison measures skills and knowledge that are not representative of problems faced in adults' daily lives and instead suggested the use

of the Instrumental Activities of Daily Living (IADLs) which they (citing Fillenbaum, 1985 and Lawton & Brody, 1969) claimed represent a “more common universe of daily activities” (p.34). However, the domains measured in the IADLs including housekeeping, shopping, food preparation, medications, and telephone usage, although obviously relevant for day-to-day living are not as focused as the expert-novice approach, which measures specialized knowledge related to the professions in work situations.

Previous studies into expertise have looked into differences in tacit knowledge between experts and novices in various fields (e.g. Klemp & McClelland, 1986; Tan & Libby, 1997; Williams, 1991) and many of these researchers found that the differences between experts and novices are in the nature and organization of their knowledge (Wagner et al., 1999). Experts are usually consulted for their skills, domain-specific conceptual understandings, strategies and experience, which are very well developed within their area (Chi et al., 1988). Tacit knowledge is said to be highly developed in the minds of experts, often automated and operating at a preconscious level (Bereiter & Scardamalia, 1992). Use of tacit knowledge is largely dependent on the patterns of circumstances and these patterns are ambiguous causing errors in application in some people (Patel et al., 1999). Experts are better at fitting knowledge into these patterns than novices (Cimino, 1999). Then, using their large accumulated knowledge base, these experts can attend to their task intuitively (Perkins, 1995). Puckett et al. (1993) argues that domains of expertise consist of knowledge that has become “automatized”. Experts’ knowledge is assessed by parallel processing, as compared to the serial (effortful) processing used by non-experts (Simon, 1973). Thus, automatization transforms the processing of

information from a serial mode to a parallel mode. This transformation occurs through practice and experience (Anderson, 1983; Shiffrin & Schneider, 1977) creating what is called by Puckett et al. (1993) citing Rybash et al. (1986) the “domains of everyday expertise” (p.9).

#### **4.3.3 Measurement of Tacit Knowledge in Work Settings**

Despite the well documented acknowledgement of the value of managing knowledge to organizations and individuals (Abell, 2001; Davenport & Prusak, 1998; Drucker, 1993; Quinn, 1992; Reich, 1991; Sternberg, et al., 1995) especially the importance of tacit knowledge for competitiveness and survival (Baumard, 1999; Choo, 1998; Grant 1996; Hall 1993; Lubit, 2001; Prahalad & Hamel 1990; Zucker & Darby, 1998) not much has been done to study it empirically and much less to actually identify and measure it (Busch & Richards, 2000). Perhaps the single factor that mostly hinders further study on tacit knowledge is that it is not easily articulated (Cooper & Sawaf, 1996; Forsythe et al. 1998; Morgan, 1986). The idea of measuring tacit knowledge depends very much on how a person views its explicability. Only those that view tacit knowledge as explicable, albeit difficult (e.g. Collins, 2001; Janik, 1988; Nonaka, 1994; Wagner & Sternberg, 1985), may hold that it is measurable. Such a view can be supported by writings of pioneers in tacit knowledge such as Polanyi (1966), Neisser (1976) and Schön (1983) who never considered tacit knowledge as inarticulable, but only as difficult to articulate.

#### **4.3.3.1 Approaches for Eliciting Tacit Knowledge**

There has been scepticism over the idea of measuring tacit knowledge, arising from the acknowledged difficulty of articulating it. Tacit knowledge researchers agree that direct inquisition of respondents on the perception they have of their tacit knowledge will not work (Forsythe, et al., 1998). Instead, special techniques and scrupulous designing of instruments are needed. Several methods have been proposed and used to elicit this *non-expressed phenomenon*. Among the methods that dominate the tacit knowledge literature are the Sense Making Technique (Dervin, 1983), Critical Incident Technique (Flanagan, 1954), Situational Judgment Tests (Motowidlo et al., 1990), Grammatical Memorisation Tasks (Reber, 1989), Mental Scanning (Reed et al., 1983), and E-mail sifting software (Lattig, 1999). These six approaches are discussed in greater detail in Appendix D.

#### **4.3.3.2 Measuring Tacit Knowledge**

The above elicitation techniques permit researchers to analyse tacit knowledge better. Within the professions, several researchers have dedicated their effort using the various elicitation techniques to develop standardized measures of tacit knowledge. These include tacit knowledge measures for managers and executives (Wagner & Sternberg, 1985), school principals (Sternberg & Grigorenko, 2001a), military leadership (Forsythe et al., 1998; Horvath et al., 1999), salespersons (Wagner et al., 1999) and school superintendents (Nestor-Baker & Hoy, 2001). Other variant measures such as the Situational Judgment Inventory (Motowidlo et al., 1990) and crystallized measures of intelligence have also been claimed to measure tacit knowledge. However, Sternberg's approach to the measure of tacit knowledge is

considered the most practical for application within the professions (Busch & Richards, 2000).

#### **4.3.3.3 Construction of the Tacit Knowledge Inventory**

The construction of tacit knowledge assessments is laborious and complex (Horvath et al., 1999). The idea of an inventory is to produce a standard assessment tool to help researchers undertake further research on tacit knowledge without having to repeat the process of eliciting tacit knowledge again.

Wagner & Sternberg (1985) describe their approach in developing the tacit knowledge inventory as follows. First, they interviewed experienced and highly successful persons (managers, in their case) by asking them to describe work-related situations/incidents, which they had experienced and had handled either particularly well or poorly (Wagner & Sternberg, 1985), incidents that can influence a task's success or failure (Nestor-Baker & Hoy, 2001) allowing identification of competencies required by a particular job. Flanagan's (1954) critical incident technique and McClelland's (1976) work on managerial job competency formed the basis for elicitation of these incidents and identification of work-related situations to use as scenarios (Forsythe et al., 1998).

These successful persons or subject-matter experts were also asked about their responses to the incidents. Wagner & Sternberg then carefully identified these incidents to determine which of the responses were based on knowledge that was

tacit in nature and learned from personal experience, not which could be formally acquired (Sternberg & Grigorenko, 2001a). Key responses were then identified through item discrimination procedures.

They then assembled these scenarios, with each scenario associated with alternative possible responses for dealing with that problem. The situations simulate specific incidents in the workplace, incidents that require use of tacit knowledge to solve (Sternberg & Grigorenko, 2001a). Acting as observable indicators of tacit knowledge, these incidents can help mitigate the problems of articulating tacit knowledge in the respondents. The methodology does not require that individuals articulate their decision processes; it only requires that they rate possible actions to scenarios. The measures developed using this method define tacit knowledge unique to a particular domain and are used to investigate tacit knowledge within that particular domain.

#### **4.3.3.4 Scoring the Inventory**

In a tacit-knowledge test, each question presents a problem followed by a set of options. The test is administered to individuals within a particular domain with varying levels of experience. The options are either to choose the best and worst alternatives from among a few options or to rate on a Likert scale the quality or appropriateness of several potential responses to the situation (Sternberg & Grigorenko, 2001a). The responses to the options are strongly dependent on the respondent's own interpretation of the problem; interpretation that relies upon knowledge that is tacit and gained through experience (Forsythe et al., 1998).



However, determining the “correct” answer to the questions in a tacit-knowledge test is problematic as what constitutes a correct action to be taken over a particular incident is debatable (ibid.). A solution to this is to administer the test using a technique applied by cognitive psychologists in studying differences in performance in experts and novices (Wagner & Sternberg, 1985), called the expert-novice comparison. The tacit knowledge test scores of the subjects under study are compared to expert profiles identified within a particular domain. The response to each problem in the test is scored against the averaged profile of a nominated expert/successful group. Statistical procedures are then used to discriminate response items that differentiate individuals of different levels of experience. These selected response items will be the relevant response item for that particular test. As most research on tacit knowledge in the professions has been to study the predictive power of tacit knowledge on job performance, the next obvious step is to examine the association of tacit knowledge with various performance measures.

The steps in the tacit knowledge test described above show the focus in tacit knowledge studies on identifying the knowledge that distinguishes experienced individuals in a domain from those that are less experienced, and further, on showing that this knowledge is correlated with job performance within experiential level.

An important premise of the tacit knowledge test is to measure what the respondents know will work and not what they will do, because what they will actually do depends on many other factors. It will depend on the surrounding environmental conditions and the problem-solver’s motivation (Scribner, 1986); his/her attitudes and beliefs (Baltes & Baltes, 1986); and retention ability (Cimino, 1999).

The knowledge that respondents apply in answering the scenario would have been formed through their interaction with various factors and circumstances. All these factors accumulate through a person's daily life to form his/her unique experiences and will influence the response to the problem posed.

#### **4.3.3.5 Tacit Knowledge Inventory for Managers**

Wagner & Sternberg, (1985) described tacit knowledge as having particular importance for managerial success and break it down into three categories;

1. managing self: maximising self performance and productivity,
2. managing others: working with, and directing others,
3. managing career: establishing and enhancing self reputation

These three categories became the core feature in the development of the Tacit Knowledge Inventory for Managers (TKIM<sup>2</sup>) (Forsythe et al., 1998). It is meant to measure knowledge acquired through managerial experience and is made up of a sequence of scenarios. For every possible solution option available, respondents are to choose a rating from a Likert Scale of 1 to 7. Empirical research has shown that the TKIM was able to predict success in managers (Wagner, Raashotte & Sternberg cited in Sternberg et al., 1993). However, using the TKIM in other domains such as the military has shown some evidence of cultural assumption in the content of inventory items (Powell, 1988). In other words, some adaptations are required for the use of TKIM in other professional areas besides management.

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<sup>2</sup> The latest version of the TKIM was published in the book *Practical Intelligence in Everyday Life* (Sternberg et al., 2000).

Managing self, others and careers defines the scope of tacit knowledge based on the content of a situation. Wagner (1987) extended the scope of tacit knowledge to include also the context of a situation, local (short-range) or global (long-range) and the orientation, whether idealistic or pragmatic. This allows the tacit knowledge framework to be constructed on a three-dimensional basis as illustrated in Figure 4.1.

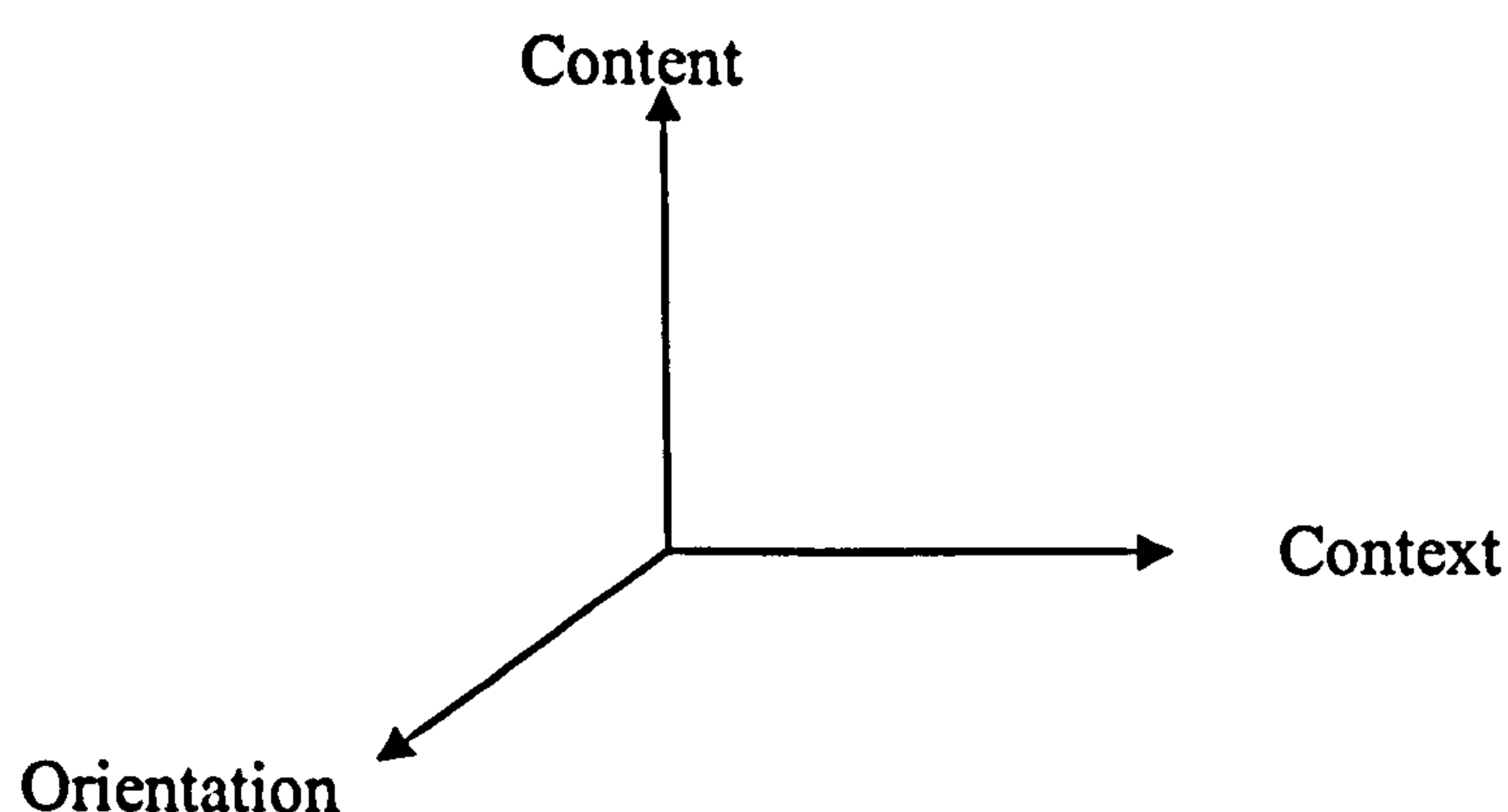


Figure 4.1: Three-dimensional framework of tacit knowledge (Adapted from Wagner, 1987).

The scenarios depicted in the TKIM will elicit different responses from different individuals. Theoretically, experts are expected to respond differently from novices due to the content and organization of their tacit knowledge (Wagner et al., 1999). In previous studies, researchers have focused on the differences in the response to the scenarios between novices and experts and correlated these differences to measures of job performance to see if a significant relationship exists between the two measures. The current research will make use of the same measure of expert-novice differences but will correlate it to aspects of individual differences in an attempt to explain the variances between the two groups and to establish the nature of the relationship necessary for success in managerial professions.

## **4.4 Individual Differences in Tacit Knowledge in the Professions**

### **4.4.1 The Source of Tacit Knowledge**

The characteristics discussed so far and the general consensus within the literature leave no doubt that tacit knowledge derives from experience (Baumard, 1999; Forsythe et al., 1998; Nonaka, 1994; Patel et al., 1999; Sternberg & Wagner, 1993; Wagner, 1987) and analogical reasoning which forms intuitions and instincts (Hatsopoulos & Hatsopoulos, 1999). When faced with the need to decide intuitively in new and unpredictable situations, making analogical inference to a known body of knowledge may help. For instance, a business manager may refer to his trained knowledge in engineering to help him make instinctive decisions. Yet, both of them concurred that “trial-and-error experience has been the biggest source of tacit knowledge” (ibid, p.150). Trial-and-error can have positive and negative consequences, and by experiencing it an individual’s intuition can be finely tuned for a better probability of success in future use. This leaves little question of the source of tacit knowledge being anything else but an individual’s personalized and practised experience.

### **4.4.2 Differences in the Level and Content of Tacit Knowledge**

In Wagner and Sternberg’s (1985) study of the role of tacit knowledge in groups of business managers, psychologists and bank managers, it became clear that there were significant variations in the level and content of tacit knowledge within the groups. These variations are believed to exist because individuals go through their experiences differently, and at different points in time and context. They also found a strong relationship between levels of tacit knowledge and measures of job

performance. In Wagner et al.'s (1999) study of tacit knowledge in the sales profession, a particularly notable finding was that there were significant differences between expert salespeople and novices. Furthermore, experience and sales performance were found to be correlated to differences in tacit knowledge in the experts' sample. The researchers concluded that the level and content of tacit knowledge is crucial for a successful career in sales.

Nestor-Baker (1999) investigated the content and quantity of tacit knowledge in public school superintendents. She found that there are differences in the amount and category of tacit knowledge between successful and typical superintendents. However, she did not conduct further analysis on factors that may contribute to these variations. Other studies have followed a similar approach in examining differences in tacit knowledge between expert and novice (Murphy & Wright, 1984; Patel et al., 1999; Tan & Libby, 1997) or successful and typical groups (Klemp & McClelland, 1986; Nestor-Baker, 1999; Wagner & Sternberg, 1987; Williams, 1991) and most have identified differences in tacit knowledge between them.

The general focus of the research discussed above was to show the importance of tacit knowledge and to link differences in levels and content of tacit knowledge to career success. Wagner & Sternberg (1985) underscored the importance of investigating variations in tacit knowledge levels and content in their statement:

"Differences in tacit knowledge were consequential for career performance in professional and managerial career pursuits" (p.452)

Despite several researchers claiming experience as the main contributor or source of tacit knowledge (Sternberg & Wagner, 1993; Wagner, 1987), few have empirically analysed the relationship between them to explain differences in tacit knowledge. The next section will discuss possible sources that can explain these differences.

#### **4.4.3 Uncovering the Source of Differences in Tacit Knowledge**

Ulmer, Jr. (1999) described, from the military context, vivid examples of leaders that displayed evidence of tacit knowledge possession that distinguished them from other leaders. He claimed that he sharpened his leadership abilities by watching exemplary personalities throughout 37 years in the US Army. Practising the skills he acquired in real-life action, he employed unique leadership techniques yet he could not explain how he devised them. Acknowledging how priceless was the “feel” that he had developed, he believed it enabled him to predict the consequences of his decisions and policies for others. Analysing other military leaders, he contended that some can sense and read signs better than others, signalling individual differences in tacit knowledge. Uncovering the source for these differences is therefore very important for the development of individuals with increased capacity for an “integrated, adroit thinking” (ibid, p.70).

Spaeth Jr. (1999), on the other hand, describes as something mystifying the way lawyers utilized tacit knowledge in practice. He claimed that he was at a loss to explain why some lawyers choose to practise hardball, whereas others do not or that some choose to disclose an intended crime, whereas others will not. He attributed this phenomenon to an individual’s conception of how he/she should practise law but, nevertheless, this indicates the existence of individual differences in the level and

content of a lawyer's tacit knowledge. The issue was mystifying to him because he tried to look at how the lawyers *intended to use* their tacit knowledge, which obviously may be influenced by many other variables such as the motivation of the lawyer, the situation and context and other environmental factors. Instead, if the focus had been on the differences in the tacit knowledge lawyers had acquired, then it may have been possible to obtain a clearer perspective of differences among lawyers in the profession. This could then lead to the discovery of the sources of the differences in tacit knowledge. One feature of the present study is that it aimed to investigate the source of differences in the levels of tacit knowledge, not how people intended to use it.

These differences can be traced to several factors. Nonaka (1994) argues that the generation and accumulation of tacit knowledge is determined by the 'variety' of an individual's experience and the individual's commitment and involvement in the 'context' of the situation (pp.21-22). But there may be antecedents to learning, with the learning process itself representing the major source of differences between tacit knowledge accumulated by different people. As an example, two managers may be equally motivated and experienced in their pursuit for career success. One, however, may be more successful than the other because he/she has attained a higher level of tacit knowledge necessary for success in the job context by being a better learner. A lot of literature, as will be discussed next, points toward differences in learning, either explicitly or implicitly, as the source of differences in the level and content of tacit knowledge. Experience alone, these writers contend, despite exhibiting prominence in relation to tacit knowledge, would not suffice. A person's aptitude to learn may be yet another differentiating factor (Leithwood & Steinbach, 1995;

Wagner & Sternberg 1987). The next section will look in more detail at how differences in learning occurred between individuals.

#### **4.4.4 Different Ways of Learning from Experience and Acquiring Tacit Knowledge**

Many authors have argued that the concept of tacit knowledge and the term “learning from experience” are inseparable (Baumard, 1999; Choo, 1998; Neisser et al., 1996; Nonaka, 1994; Nonaka & Takeuchi, 1995; Patel et al., 1999; Sternberg & Grigorenko, 2001a; Wagner, 1987; Wagner & Sternberg, 1987). The learning process has been highlighted as one important reason why some people are less adept at acquiring knowledge from experience than others and an important part of that process is the learning environment. Sternberg & Grigorenko (2001a) have suggested that informal or implicit learning environments, compared with formal ones, do not adequately support the knowledge acquisition process for some individuals. In such environments, learners have to rely on their own capability to acquire knowledge from experience. Sternberg (1988) also alludes to this as he argues that formal learning environments support knowledge acquisition by facilitating the process of selective encoding, selective combination and selective comparison, which are arguably essential features of the learning process for many people. Informal learning environments often fail to provide these features, and this may be one important factor accounting for the “explicit recognition of individual variation in the ability to learn from experience...” (Reuber et al., 1990; p.267).

In addition to the context of the learning environment, individual differences in preferred ways of organizing and processing information and experience are likely to



have a profound effect on the acquisition of tacit knowledge. Exploring this relationship further will benefit researchers in understanding the construct of tacit knowledge, especially in its acquisition, and would help management trainers to conceive the “unteachable” tacit knowledge. This will be discussed in more detail in the next chapter.

Three main notions can be deduced from the arguments made so far. Firstly, a major source of tacit knowledge is experience. Secondly, there exist differences between individuals in the level and content of tacit knowledge acquired. Thirdly, differences in the level and content of tacit knowledge can largely be attributed to the different ways in which people learn from experience. This may be affected by both the context of the learning environment and by differences in the way individuals prefer to engage in the learning process. We will now explore issues around the question posed by Colonia-Willner (1998) as she raised important areas for future research in the field, “...why do some experts (e.g., managers) learn more from their experience than do others” (p.56).

Hedlund et al’s (2001) work can be seen as an attempt to answer this question. They looked into the process of tacit knowledge acquisition from the perspective of three interacting components: selective encoding, selective combination and selective comparison. This knowledge-acquisition model is derived from the componential sub-theory of Sternberg’s (1985) triarchic theory of human intelligence. It is designed to enhance our understanding of the acquisition of all forms of knowledge and is not unique to tacit knowledge. In dealing with a situation, an individual will first identify and make sense of relevant information necessary for understanding the

issue. Next, he/she needs to integrate all the relevant information into a comprehensive cognitive structure. The final step in this process is to relate and compare this newly formed information to relevant prior knowledge. Hedlund et al., (2001) contended that individuals differ in their ability to learn from experience by virtue of their ability to perform the above processes in dealing with real-world, everyday, practical problems.

It is the contention of the present study that within the knowledge-acquisition model described above, more prevalent elements affecting the variability in acquisition of tacit knowledge lie in individuals' traits; their pre-established cognitive patterns that filter incoming information uniquely to an individual (Baumard, 1999). For example, the selective encoding and selective combination processes clearly involve the processing of information by an individual. It has been known for some time now that individuals differ in the way they perceive, conceptualise, organise and process information and these differences depend on several attributes unique to the individual, referred to by Messick (1976) as cognitive styles.

The above evidence is consistent with an earlier argument presented in Chapter 3 on Sternberg et al's (2000) model of knowledge acquisition pathways. There, it was argued that the reason why one individual might fail to acquire particular knowledge is the limitation of experience itself, and the fact that rarely do individuals go through entirely the same experience. Where individuals do go through very similar experiences, the issue is then not with some individuals failing to acquire the knowledge, but rather that individuals learn from their experiences in different ways, leading to differences in the level and content of tacit knowledge. This is the area

where the present study will make the most contribution, adding to what is currently a very limited understanding of tacit knowledge acquisition (Hedlund et al., 2001; Wagner & Sternberg, 1985; Sternberg et al., 1993; Sternberg & Wagner, 1993).

#### **4.5 Conclusion**

The present research asserts that investigating the relationship between the different ways people learn from their experiences, and how this impacts on variations in the level of their accumulated tacit knowledge will make a significant contribution to the field. Recognizing the importance of differences in the level of tacit knowledge to career success, the study focuses on identifying causes for these differences, leading to the overarching research question of the study “What factors differentiate the way some individuals learn from experience compared with others?” The study adopts the common approach of using the expert-novice perspective to focus on differences between groups as well as differences within groups. A major deviation from previous research in the field, however, is that the current study is aimed at searching for the cause of differences in the level of tacit knowledge, rather than merely predicting performance.

This chapter builds on from Chapter 3 which concluded that most effective learning by managers takes place in informal settings and this was linked to a form of knowledge closely associated to experts and successful people, tacit knowledge. This chapter then follows on from that conclusion to investigate the nature of tacit knowledge in greater detail. The present research, following Sternberg & Horvath (1999), will take the definition of tacit knowledge to be ‘knowledge that is grounded in personal experience, and is procedural rather than declarative in structure’.

Possible reasons behind claims that experts and successful people tend to display higher levels of tacit knowledge compared to novices were also investigated. A major finding was that people tend to learn in different ways from their experiences as a result of their pre-established cognitive patterns, which influence the way they perceive, conceptualise, organise and process information. Unique attributes of an individual may account for these differences and this may contribute to the variations in tacit knowledge between different people. Such consistent individual differences in preferred ways of organizing and processing information and experience are encompassed in the notion of styles (Messick, 1976).

The next chapter will explore this relationship in greater detail and look at the possibility that individual differences in learning styles may account for differences in levels of accumulated managerial tacit knowledge acquired through experiential learning.

## **CHAPTER 5**

### **FACTORS ACCOUNTING FOR DIFFERENCES IN THE ACQUISITION OF TACIT KNOWLEDGE**

#### **5.1 Introduction**

The relationship between learning styles, an individual difference construct, and tacit knowledge was established in Chapter 3. The present chapter will look at this relationship in more detail. However, it will first of all begin by looking at the broader picture of the various individual difference factors in the acquisition of tacit knowledge. As previously discussed, this study will investigate acquisition of tacit knowledge from the learning perspective. In order to do this, it is necessary to perceive tacit knowledge as a learning outcome. Evidence and arguments in previous chapters provide support for viewing the knowledge from this perspective. This is conceived by referring once again to Sternberg & Wagner's (1986) claim that tacit knowledge is a product of learning that affects performance in real-world settings. This chapter explores the possibility that individual differences in learning styles may account for differences in levels of accumulated managerial tacit knowledge acquired through experiential learning.

#### **5.2 Individual Differences in the Acquisition of Tacit Knowledge**

A range of individual differences, such as intelligence, cognitive controls, cognitive styles, learning styles, personality, and prior knowledge, can impact on learning outcomes (Jonassen & Grabowski, 1993). Earlier studies have explored the relationship of several of these variables to tacit knowledge. The first, intelligence

has long been viewed as having a strong relationship to knowledge. Newell (1982) for instance, points out that two persons may attain different levels of utility from a knowledge embedded in a representation due to differences in their mental processing ability. However, the relationship between mental ability and tacit knowledge is not supported by the findings of the following empirical studies.

In their landmark empirical study of the role of tacit knowledge in real-world pursuits, Wagner & Sternberg (1985) tested the relationship between tacit knowledge and intelligence to probe the possibility that measures of tacit knowledge might actually be measuring verbal intelligence. Tacit knowledge was measured using a tacit knowledge questionnaire that they developed for this research and verbal intelligence was measured using a standard verbal reasoning test: the Verbal Reasoning subtest of the Differential Aptitude Tests (Form T; Bennett et al., 1974). From the results, they concluded that there is no relationship between tacit knowledge and verbal intelligence. Wagner (1985, 1987) in his doctoral dissertation also found that tacit knowledge scales do not correlate with verbal reasoning ability. Other research produced similar findings: Kerr (1991) found no significant relationship between tacit knowledge scores and a measure of verbal ability in a laboratory study using undergraduate student subjects, while Jagmin et al. (1989 cited in Kerr, 1991) obtained a similar finding for a group of experienced business managers. One exception is in the research done on tacit knowledge for military leadership (Forsythe et al., 1998). In that research, tacit knowledge was found to correlate to the Concept Mastery Test of intelligence. The authors, however, attribute this relationship to the known relationship between intelligence and leadership.

Sternberg & Grigorenko (2001a) provide some insight into the poor relationship between measures of tacit knowledge and measures of mental ability. In explaining people's differences in performance, they argued that measures of abilities only partly account for the differences, leaving much of the differences unexplained. Besides that, tacit knowledge that is used to solve practical problems differs in nature from formal knowledge, knowledge used to solve academic problems and measured using measures of mental abilities. Table 5.1 illustrates the distinction between the two types of problems. Furthermore, tacit knowledge being a form of practical intelligence differs from academic intelligence in that "in academic intelligence, the relevant knowledge is of content and rules, and is formal and out in the open" whereas "in practical intelligence...the relevant knowledge is of norms, and the knowledge is informal and often tacit" (Sternberg & Wagner, 1993: p.2). As such, tacit knowledge measures would obviously not correlate to conventional measures of ability which is mostly focused on "academic" or formal knowledge.

**Table 5.1: Academic problems versus practical problems**

Academic Problems	Practical problems
Formulated by other people	Formulated by the problem solver
Well-defined	Ill-defined
Comes with all the information needed to solve them	Problem solver must find the necessary information himself/herself
Possess only a single correct answer	Possesses multiple acceptable solutions
Dislodged from ordinary experience	Embedded in personal experience
Of little or no intrinsic interest to the problem solver	Demands motivation and involvement of the problem solver

Source: Sternberg & Wagner (1993)

In uncovering the sources of variability in level of tacit knowledge in managers, it is hoped that training providers responsible for the development of managers and executives can be better equipped to help individuals enhance their level and content of tacit knowledge nearer to that of successful managers. However, if the source of differences is genetically rooted in such things as intelligence, it would be of little use for improving management development initiatives. The same can be said of other individual traits such as cognitive controls and cognitive styles. All are believed to be stable individual traits that would not lend themselves easily to developmental opportunities. Consequently, their utility in management development initiative is rather limited, despite their being widely recognised as highly significant in understanding human characteristics. Certain measures of mental ability (those involving crystallized intelligence tests), despite being claimed to measure tacit knowledge (Gottfredson, 2003), are also perceived to be rather intrusive when used in managerial settings with experienced managers. This makes mental ability tests a less viable option when compared with tests using job related scenarios such as those used in tacit knowledge inventories.

Personality measures are also viewed as problematic in dealing with tacit knowledge. Tests conducted by Wagner and Sternberg (1990) involving tacit knowledge revealed near non-significant correlations with personality measures including the California Psychological Inventory, the Myers-Briggs Type Indicator, and the Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B). They found that TK scores generally exhibited nonsignificant correlations except in the Social Presence factor of the California Psychological Inventory and the Control Expressed factor of the FIRO-B, which mildly correlated with TK scores at 0.29 and 0.25 respectively. One



reason for this may be due to the scale of constructs covered by personality measures.

As Jonassen & Grabowski (1993) point out:

“Personality is perhaps the broadest dimension of individual differences, subsuming to a large degree, most of the other dimensions” (p.303)

One example of this claim can be found in Miller’s (1988, cited in Jonassen & Grabowski, 1993) model of personality which comprises three domains: cognitive, affective and conative. Jonassen & Grabowski (1993) point out that the cognitive domain of Miller’s model consists of an analytic-holistic dimension: the underlying principle of many cognitive styles. Furnham et al., (1999) also draws readers’ attention to previous research that found considerable inter-correlation between personality variables and learning styles and concluded that learning styles are a subset of personality.

If mental ability and personality measures correlate poorly to tacit knowledge measures, this would obviously discount the role of the two variables to explain the variability in the level of tacit knowledge. What, then, is the better variable to explicate the differences in tacit knowledge? Tacit knowledge, being closely associated with personal experience, will depend on the nature of the individual for its acquisition and this will depend to a great extent on a person’s preferred way of learning. Furthermore, as all tacit knowledge is a subset of procedural knowledge (Sternberg & Grigorenko, 2001a), it is therefore unconsciously formed with automatic learning outside our field of consciousness (Reber & Lewis, 1977; Bereiter & Scardamalia, 1992). Being automatic and outside the field of consciousness, tacit knowledge acquisition will depend greatly on a person’s preferred way of learning.

People will usually learn, especially without formal instruction, in their preferred mode of learning, expressed in the notion of style. It follows, therefore, that differences in tacit knowledge among individuals can perhaps be understood by considering the learning style construct. This view is supported by Sternberg & Grigorenko (2001b) who acknowledged that the styles construct lies "...at the interface between abilities, on the one hand, and personality, on the other" (p.2).

The preceding discussions lead to the proposition that differences in learning style will result in differences in learning outcome, and consequently in the level of accumulated tacit knowledge.

### **5.3 Experiential Learning and its Relationship to Tacit Knowledge in the Professions**

The influential psychologist, Carl Rogers (1961) stated that:

"Experience is, for me, the highest authority. The touchstone of validity is my own experience. No other person's ideas, and none of my own ideas, are as authoritative as my experience. It is to experience that I must return again and again, to discover a closer approximation to truth as it is in the process of becoming in me" (pp. 23-24).

Such was the weight placed upon experience, and learning from experience became a focal point of many theorists and researchers. Experiential learning as a discipline attracts interest in wide-ranging fields, from farming to workplace training and development.

Weil & McGill (1989) categorize experiential learning into four different 'villages' as in the following quote:

"...we discern four emphases for experiential learning.

Village One is concerned particularly with assessing and accrediting learning from life and work experience as the basis for creating new routes into higher education, employment and training opportunities, and professional bodies.

Village Two focuses on experiential learning as the basis for bringing about change in the structures, purposes and curricula of post-secondary education.

Village Three emphasizes experiential learning as the basis for group consciousness raising, community action and social change.

Village Four is concerned with personal growth and development and experiential learning approaches that increase self-awareness and group effectiveness" (p.3).

As the current research is focused in the professions, it can be grouped into Village One. Among the various works on experiential learning, the ones most relevant to the current research in investigating tacit knowledge are those that examine experiential learning as a learning process.

### **5.3.1 Learning Model within Experiential Learning**

Within experiential learning, learning is described as a process by which a learner reflects upon his/her experience, which results in new insights. One notable researcher in the field of learning and learning styles is David Kolb, who developed the Experiential Learning Theory (ELT) which is perhaps the most developed and

well-researched model of experiential learning (Kolb, 1984). Kolb et al. (1999) claimed that his theory is called “experiential learning” to emphasize:

“the central role that experience plays in the learning process, an emphasis that distinguishes ELT from other learning theories” and “to differentiate ELT both from cognitive learning theories, which tend to emphasize cognition over affect, and behavioral learning theories that deny any role for subjective experience in the learning process” (p.2).

This theory is influential in explaining aspects of individual differences in modes of adaptation and adjustment in learning. The theory is the product of the integration of the Lewinian model of action research, Dewey’s model of learning, and Piaget’s model of cognitive development. In this theory, experiential learning is defined as:

“...the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience” (Kolb, 1984; p.41)

From the experiential learning perspective, there is an assumption that experience needs to be acted upon, in order for learning to take place. Wight (1970) cited in Ekpenyong (1999) suggests that people seldom learn from their experience unless the experience is examined as a means of providing meaning as the individual sees it. Through the process of examination, understanding, insights and discoveries are made to add value to the particular experience as well as other prior experiences. These are then integrated into the person’s “...system of constructs which he imposes on the world, through which he views, perceives, categorises, evaluates and seeks experience” (pp.234-282)

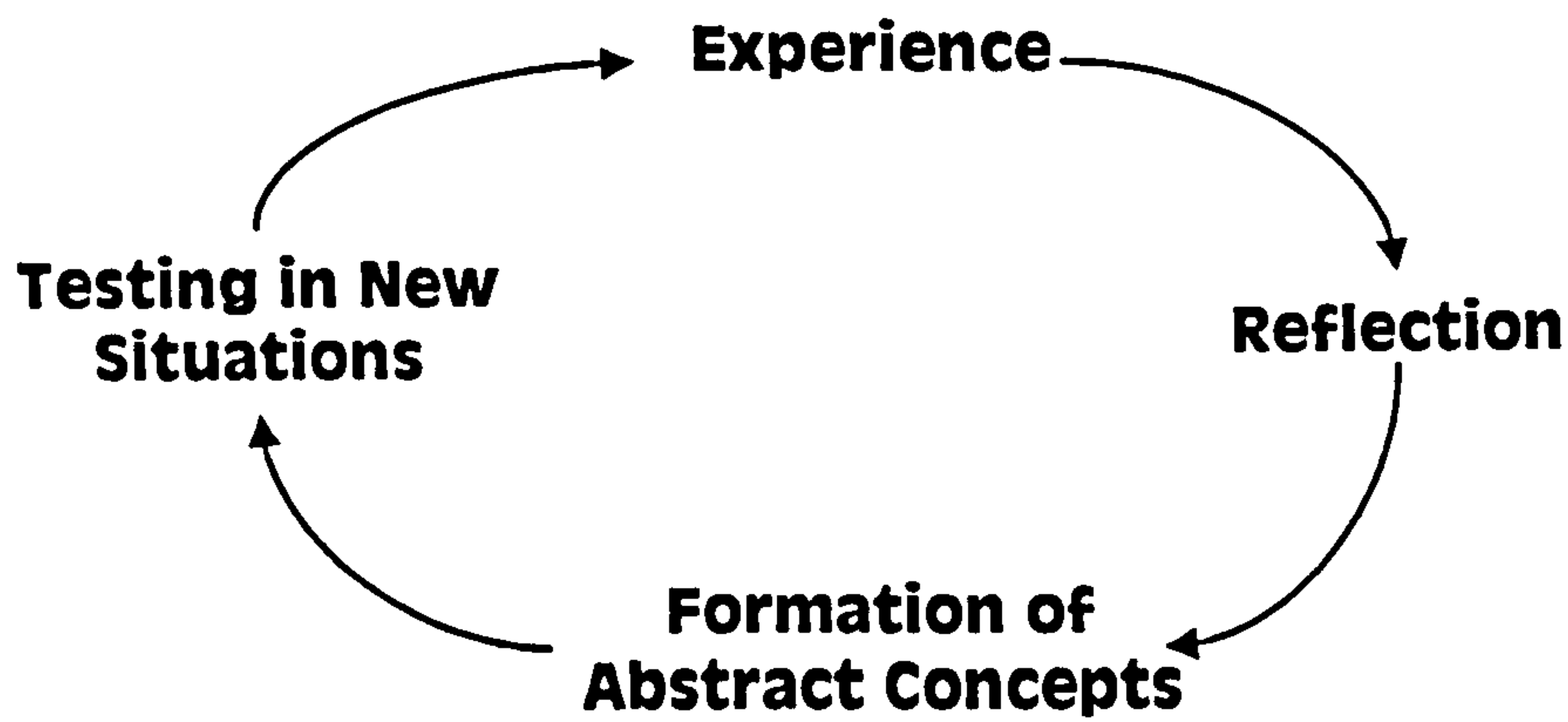


Figure 5.1: Kolb's Learning Cycle (Source: Kolb, 1984).

Kolb's four stage model of learning from experience (Figure 5.1) is based on such a process (Kolb & Fry, 1975). The process starts with an experience, where learners acquire information by immediate concrete experience from full involvement, without bias, in the new experience. This is followed by reflection. Here, the experiential data are reflectively observed, organized and examined from different perspectives. The reflection is then assimilated into a theory, in which learners develop generalizations that help them internalize and integrate their observations into sound theories or principles. Finally, these new or reformulated theories are tested in new, more complex situations. This process produces a recurring cycle as new information enters the now modified concrete experience phase.

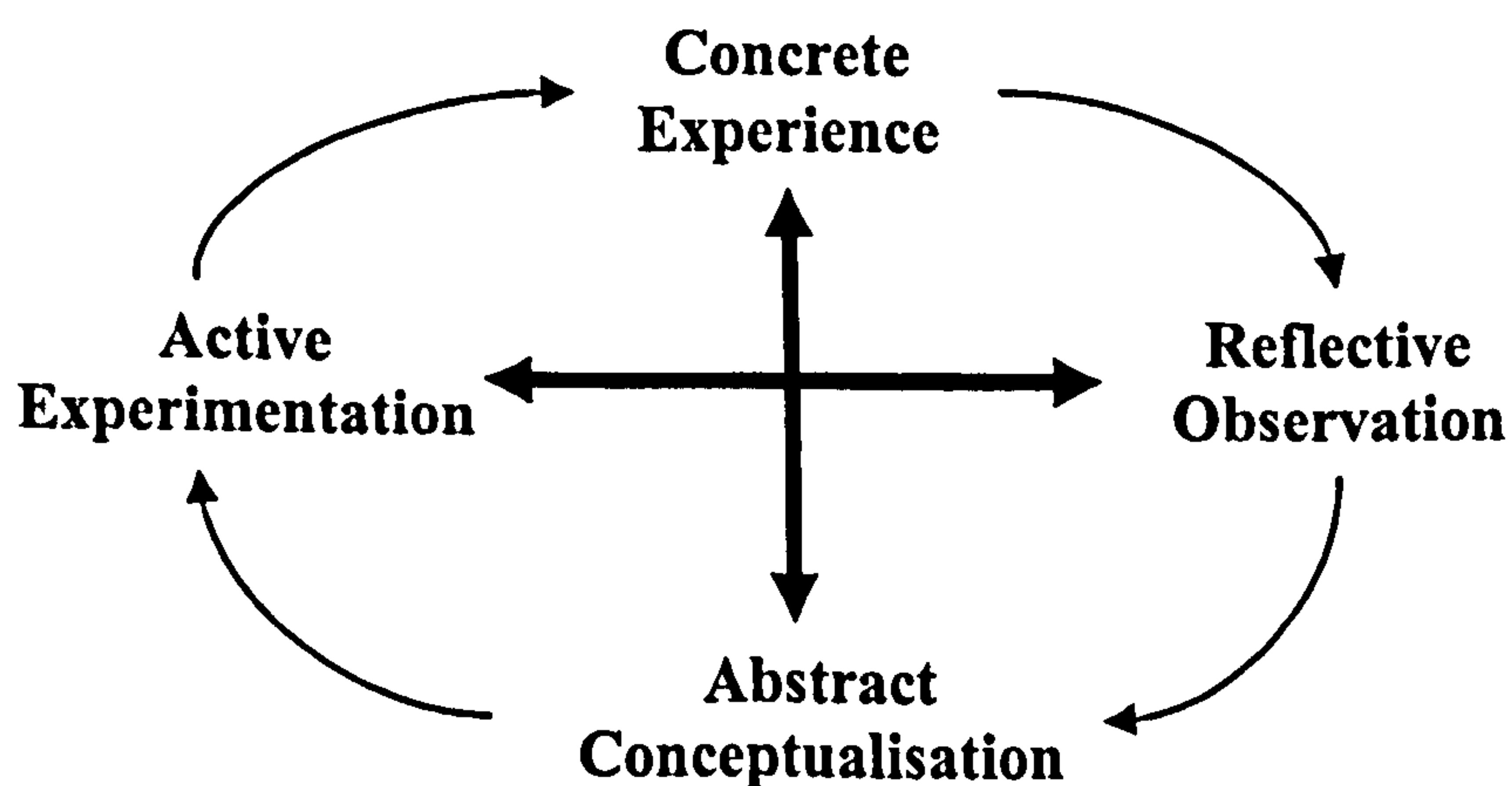


Figure 5.2: The two dimensions of Kolb's Model (Adapted from Kolb et al., 1999).

The concept of the four-stage learning process was then developed further into two orthogonal dimensions of learning. Using statistical intercorrelations, the polar extremes of concrete-abstract and active-reflective dimensions of cognitive growth were formed. The concrete-abstract dimension (also called the prehension/ perceiving dimension) represents how one prefers to perceive the environment or grasp experiences in the world. The concrete-abstract dimension involves direct experience with emphasis on felt or intuitive qualities. This is in contrast to the grasping of experience through conceptual interpretation and symbolic representation (both analytical and linear). The active-reflective dimension (also called the transformation/ processing dimension) represents how one prefers to process or transform incoming information (Kolb, 1984), whether through internal reflection or by manipulating or changing the information and its environment.

The model represents a four-stage cycle of learning from concrete experience (CE) leading to reflective observation (RO) on that experience followed by the development of theory through abstract conceptualization (AC) (Figure 5.2). The theory is then tested through active experimentation (AE) which leads to new concrete experiences, and so the cycle continues. Kolb (1984) also suggested that individuals are likely to have particular preferences for engaging with each of these four learning modes.

Possession of all four different abilities indicated by the four poles of the model was argued by Kolb and Fry (1975) to be critical for effective learning from experience.

Not everyone, however, is strong in all four modes and, in fact, most people tend to develop particular strengths in one or two of these. Recognition of this led to the development of the concept of learning styles to explain these phenomena. The two distinct dimensions of Concrete Experience-Abstract Conceptualization and Reflective Observation-Active Experimentation are orthogonal and form four quadrants that lead to different learning styles (Kolb, 1984). Divergers combine the learning steps of concrete experience (CE) and reflective observation (RO). Assimilators combine the steps of reflective observation (RO) and abstract conceptualization (AC) (Figure 5.3). Convergors combine the steps of abstract conceptualization (AC) and active experimentation (AE). Accommodators combine the learning steps of active experimentation (AE) and concrete experience (CE). Table 5.2 describes the characteristics of the four types of learner.

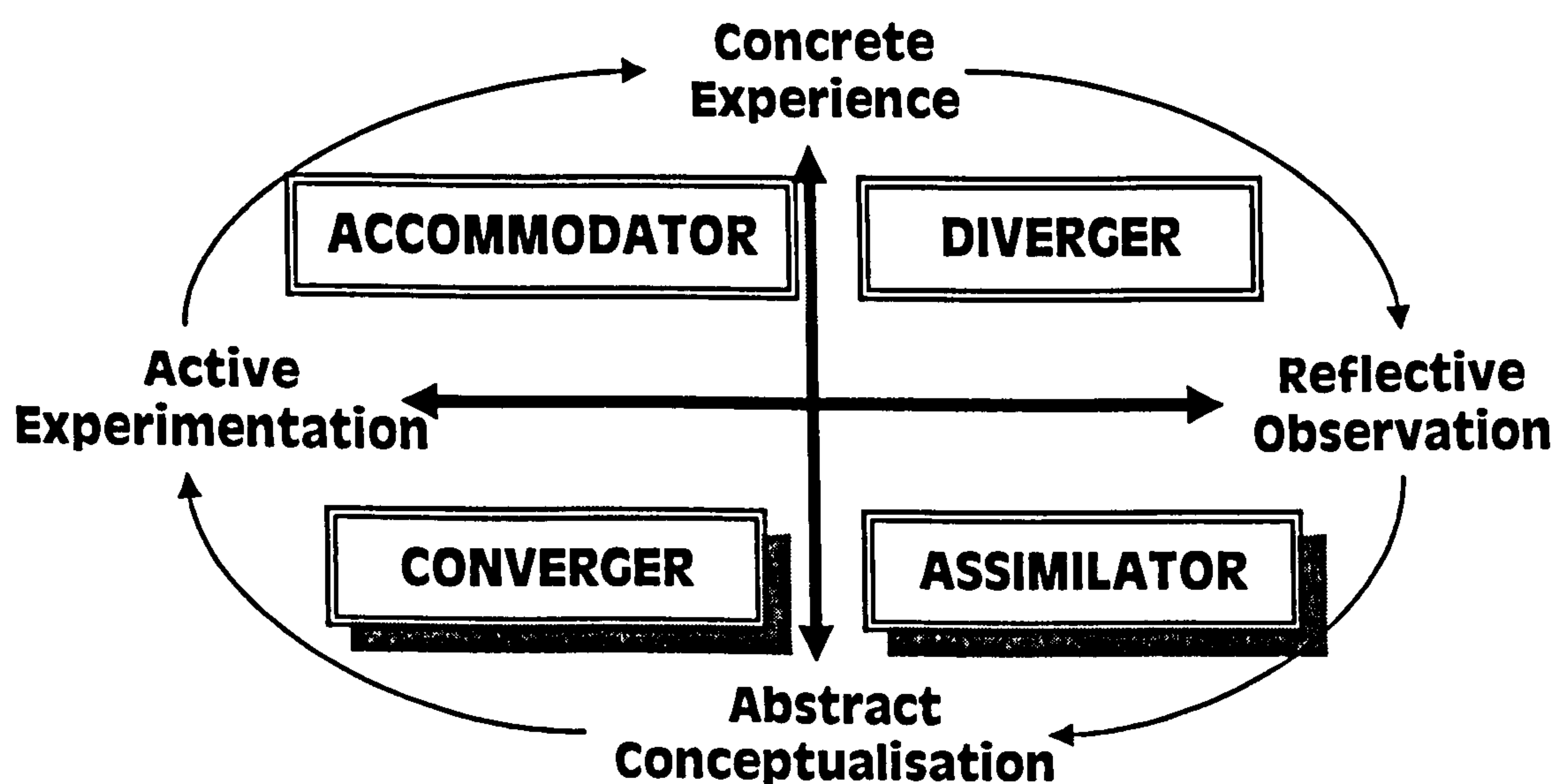


Figure 5.3: Kolb's Learning Styles (Adapted from Kolb et al., 1999).

**Table 5.2: Characteristics of the four learning styles**

	Dominant Learning Ability	Characteristics
Converger	Abstract Conceptualization and Active Experimentation	<ul style="list-style-type: none"> <li>• good at finding practical uses for ideas and theories</li> <li>• have ability to find solutions to solve problems</li> <li>• prefer technical over social tasks/problems</li> </ul>
Diverger	Concrete Experience and Reflective Observation	<ul style="list-style-type: none"> <li>• good at generating ideas and seeing things from different perspectives</li> <li>• have broad cultural interests and like to gather information</li> <li>• interested in people</li> <li>• tend to be imaginative and emotional</li> </ul>
Assimilator	Abstract Conceptualization and Reflective Observation	<ul style="list-style-type: none"> <li>• strong ability to create theoretical models</li> <li>• excel in inductive reasoning</li> <li>• concerned with abstract concepts rather than people</li> <li>• best at understanding a wide range of information and putting into concise, logical form</li> <li>• less focused on people and more interested in ideas and abstract concepts</li> <li>• logical soundness rather than practical value</li> </ul>
Accommodator	Concrete Experience and Active Experimentation	<ul style="list-style-type: none"> <li>• ability to learn from primarily “hands-on” experience</li> <li>• enjoy carrying out plans</li> <li>• involve themselves in new and challenging experiences</li> <li>• act on “gut” feelings</li> </ul>



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Accommodator  
(cont.)

rather than on logical  
analysis

- rely more heavily on people for information than on their own technical analysis to solve problems
- greatest strength is doing things
- perform well when required to react to immediate circumstances

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Adapted from Tennant (1997) and Kolb et al. (1999)

#### 5.4 The Style Construct

Various dimensions and theories of styles exist. However, style constructs that are of interest to the present study are those that are related to experience. This, as argued earlier, is by virtue of the proximity of tacit knowledge acquisition to experience.

The concept of style is used as a construct in psychology and is used for studying individual differences in learning and behaviour (Riding & Rayner, 1998). Several researchers have explored the role of style in affecting learning outcomes (Zhang, 2001). For Sternberg & Grigorenko (2001a), their interest in the notion of styles existed, in part, as an attempt to fill the gap left by conventional ability tests in accounting for people's differences in performance.

Allport (1937) has been reported to be the first person to use the notion of style (e.g. Riding & Rayner, 1998; Sternberg & Grigorenko, 2001a). Style is believed to constitute a preference to do things, irrespective of their ability to do it (Zhang, 2001)

and there appears to be a general consensus for this view. However, differences exist in the literature as to whether style is stable and consistent or whether it is modifiable in an individual. Sternberg & Grigorenko (2001a) believe that styles are habitual, “consistent over long periods of time and across many areas of activity” (p.2). Zhang (2001) on the other hand, believes that styles can change with situations, time and demands and therefore, it is possible to provide avenues for change to match needs or effectiveness. According to Armstrong (2006) these conflicts of views possibly arise because researchers use the terms cognitive style and learning style interchangeably when they are in fact different.

Armstrong (1999) revealed 54 different dimensions along which the terms cognitive/learning style had been differentiated, and recently extended this list to well over 70. To bring a semblance of order to the conceptual confusion arising from this plethora of definitions and operationalisations of the constructs, Armstrong & Priola (2001) delineated cognitive style from learning style by drawing on the work of previous authors (e.g. Curry, 1983; Riding & Cheema, 1991). Armstrong (2006) later elaborated on the work of Curry (1983; 2000) as follows:

“Curry (1983; 2000) proposed a heuristic model to organize the theory, resembling layers of an onion in which she placed individual difference constructs. In the outer layer she places what has been labelled ‘Instructional Preference’ which refers to the individual’s choice of environment in which to learn. She believes this to be the least stable and the most easily influenced level of measurement in the learning styles area. An example of a learning style model which would fit sensibly into this layer is the Dunn, Dunn & Price (1984) model which defines learning style in terms of individual student reactions to twenty three elements of instructional environments. The second layer, labelled ‘Information Processing Style’, is regarded as an individual’s approach to assimilating information and due to its relative de-coupling from the environment is believed to be more stable than the outer layer, though it can still be modified to a degree by learning

strategies. *Learning Styles* would be managed within this middle layer, a suitable measure being the Learning Style Inventory (Kolb, 1984). The inner layer of the model is labelled 'Cognitive Personality Style', defined as an individual's approach to adapting and assimilating information, which does not interact directly with the environment and is believed to be a relatively permanent personality dimension. Measures which Curry suggests would measure Cognitive Style at this innermost level would be Witkin et al's (1962) "Embedded Figures Test", Kagan's (1965) "Matching Familiar Figures Test" and Myer's (1962) "Myers-Briggs Type Indicator".

Of these, Kolb's (1984) Learning Styles Inventory which was derived from his earlier experiential learning theory described above was chosen to inform the present research because it is firmly rooted in experiential learning theory which is at the heart of the present research. According to Kolb & Kolb (2005a), the July 2005 update of the experiential learning theory bibliography includes 1876 entries. A previous analysis of the 1004 entries in the 1999 bibliography (Kolb & Kolb, 2005b) shows 207 studies in management, 430 in education, 104 in information science, 101 in psychology, 72 in medicine, 63 in nursing, 22 in accounting and 5 in law. Approximately 55% of this research appeared in refereed journal articles, 20% in doctoral dissertations, 10% in books and 15% in other venues such as conference proceedings.

#### **5.4.1 The Learning Styles Inventory (LSI)**

The Learning Styles Inventory (LSI) consists of learning situations that are presented in twelve statements and respondents are forced to rank-order four sentence endings that correspond to the four learning styles. Kolb et al. (1999) describes the development of the Learning Styles Inventory, noting that it was first developed in 1971, and first published in 1976 (Kolb, 1976). The major criticism of this inventory

at that time concerned the internal consistency of the scales, and the scales' test-retest reliability. These criticisms led to the development of the second version of LSI, the LSI-II in 1986 (Smith & Kolb, 1986). Internal consistency of the scales was reported to be improved, but critics continued to report problems with test-retest reliability. The most recent version, the LSI-III, was released in 1999 and it was stated that "randomizing the order of the LSI-II items have resulted in dramatic improvements in its test-retest reliability" (Kolb et al., 1999; p.6).

#### **5.4.2 Criticisms Against Kolb's Experiential Learning**

Being one of the more popular models on experiential learning, Kolb's theory was also extensively scrutinized. Kayes (2002) divided the criticisms into two areas: empirical validation of the theory and the theoretical limitations of its instrument. The empirical issues usually centre on the psychometric properties of the Learning Style Inventory (LSI). Sewell (1986) cited in De Ciantis & Kirton (1996) for instance, revealed a lack of internal reliability in the LSI with the  $\alpha$  coefficients ranging from a low of .34 for "Concrete Experience" and up to .70 for "Abstract Conceptualisation". Similar concerns have been expressed with regard to construct validity, reliability, and stability (Atkinson, 1989; Marshall & Merritt, 1985). Later versions of the LSI (the LSI-II), however, have since been claimed to have better psychometric properties (Yahya, 1998), especially test-retest reliability (the LSI-III) (Kolb et al., 1999). Two comprehensive reviews of the literature on this theory by Hickcox (1991) and Iliff (1994) have shown that there is either full or partial support for the theory in 78% and 88% of the publications respectively.

Criticisms of the theoretical limitations of Kolb's model emerged in the 1990s (Kayes, 2002) and were more diverse than the psychometric criticisms. Among the issues raised were that Kolb had accidentally conflated style, level and process – three unrelated cognitive elements, into the experiential learning process (De Ciantis & Kirton, 1996) and that Kolb's theory divorces people from the social, historical and cultural aspects of self, thinking and action (Holman et al., 1997). Smith (2001), insisting that the relationship between learning and knowledge is problematic, claimed that Kolb had not given enough attention to the nature of knowledge that emerged from experiential learning. However, despite the critics, Beard and Wilson (2002) stress that within management education, Kolb's theory is "extremely influential" and "is rarely seen as problematic" (p.37).

## **5.5 Research Hypotheses**

In the next chapter, a discussion of the diversity of methods available to conduct research will be presented. In that chapter it will be argued that different research methods must be employed on different research questions, based on the best method available for a particular research question. Based on this principle and referring back to the research questions outlined in Chapter 1, the first two research questions, which are exploratory in nature would be best answered from a qualitative perspective. This will be addressed in Chapter 8. The remaining research questions, listed below, are more concerned with confirming relationships and this is best approached by using a quantitative method. Several testable hypotheses were derived from the following research questions:

- Is there a relationship between learning styles and managerial tacit knowledge?
- Does general experience, and experience within a managerial context contribute in different ways to the acquisition of managerial tacit knowledge?
- What relationship exists between the different learning modes/abilities and the levels of managerial tacit knowledge?

This section will discuss the development of research hypotheses arising from these research questions. The following arguments, based on the review of the literature made so far, present the reasoning behind the development of each hypothesis.

The underlying premise of the present research, as with previous research involving expert-novice groups of people, is that the level (and content) of tacit knowledge differs between the two groups. Several previous studies have confirmed this finding within the same professional context (e.g. Klemp & McClelland, 1986; Nestor-Baker, 1999; Patel et al., 1999; Tan & Libby, 1997; Williams, 1991). It is therefore hypothesized that there will be significant differences in the levels of managerial tacit knowledge between the two groups of novice and expert managers

*Hypothesis 1: Expert managers will have accumulated significantly higher levels of managerial tacit knowledge than other groups of employees within a related work context.*

The role of experience in the acquisition of tacit knowledge has been widely acknowledged within the literature on tacit knowledge. However, previous studies have revealed mixed results on the relationship between length of experience and tacit knowledge (Colonia-Willner, 1998; Wagner, 1987; Wagner & Sternberg, 1985).

It has been argued that learning from experience results in a form of knowledge that is tacit in nature (Nonaka & Takeuchi, 1995; Sternberg & Wagner, 1986). If learning from experience should lead to the accumulation of tacit knowledge, it follows therefore that the greater the length of experience a person has, the more the opportunity they have to learn from it, resulting in a higher level of tacit knowledge acquired. This gives rise to the following hypothesis:

*Hypothesis 2: There is a significant relationship between the length of general experience and the level of accumulated managerial tacit knowledge (LAMTK).*

In preceding discussions it has been argued that the acquisition of tacit knowledge depends on learning from experience. It has also been argued that learning styles affect ways of learning from experience. Furthermore, it was claimed that tacit knowledge acquisition is not supported by direct instruction (Sternberg et al., 2000) and therefore it is dependent on the individuals themselves to acquire it. This leads to differences in the level of the accumulated tacit knowledge, as individuals learn from their experiences in different ways. The different ways people learn from their experience are contained in the notion of learning styles. The following hypothesis will establish a link between learning styles and the acquisition of managerial tacit knowledge.

*Hypothesis 3: There is a significant relationship between learning styles and LAMTK.*

According to Kolb (1984), learning is concerned with the production of knowledge, a view that is endorsed by Jarvis (1987) who believes that Kolb has successfully demonstrated an intimate relationship between the two terms. It was previously

argued that not only is tacit knowledge an important product of experiential learning, but that variations are known to exist within and between groups of managers in terms of the content and level of accumulated tacit knowledge, even though they may engage in similar experiences. Two reasons are given for this.

Firstly, tacit knowledge is likely to be context-dependent (Choo, 1998; Sternberg & Grigorenko, 2001a) which means that within the professions, an individual's work environment may have a significant influence on accumulated tacit knowledge. Wagner (1987) addressed the context of the situation in his research by adding local (short-range) and global (long-range) to the scope of tacit knowledge he was investigating. In a similar move, this study will control for differences in context by differentiating between time spent performing managerial functions compared with non-managerial functions. In the present study, this is done by differentiating between those who have spent most of their recent working career performing duties in a predominantly managerial context from those who have spent most of their recent careers performing functions in a context that is relatively less managerial in nature. The latter include professionals such as engineers or accountants who are in the early stages of a transition into the field of management (refer to Appendix E for the method of differentiating between predominantly managerial and non-managerial work). This leads to a fourth hypothesis:

*Hypothesis 4: Subjects working in a predominantly managerial context will have a higher LAMTK than those employees who perform functions in a context that is relatively less managerial.*

A high tacit knowledge score on the TKIM occurs when a small difference is observed in the scores made by respondents compared against scores of an expert



profile. This is referred to here as having a higher LAMTK. Variations in LAMTK may also derive from the fact that people are influenced by their dominant learning style when learning from experience (Kolb, 1984) and this will determine the level of effectiveness of their learning. The degree to which a person's style is matched with the context of their work environment is clearly an important factor<sup>1</sup>, which will probably impinge on the level of managerial tacit knowledge acquired. Nulty and Barret (1996) contend that "different disciplines occupy differing epistemological positions, and that they traditionally adopt a particular mode of discourse or educational process" (p.334). Kolb (1999) lends support to this view by stating that "certain learning styles tend to gravitate towards certain career types" (p.13) and gives a range of career patterns and characteristics for each of his four learning styles. For example, the psychology profession is deemed to be consonant with the diverging learning style, mathematics with the assimilating style, engineering with the converging style and management with the accommodating style. The reason given for the latter is that career characteristics associated with management are likely to lead to needs for dealing directly with people, seeking and exploiting opportunities, and influencing and leading others. These characteristics are symptomatic of the accommodating learning style and are of primary concern to this research due to its proposed linkage to the managerial profession. This leads to the fifth hypothesis:

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<sup>1</sup> To avoid problems of 'reverse causation', where those with a good sense of requisite tacit knowledge are selected into management, rather than managerial tacit knowledge being increased by performing managerial functions, a look at the job placement policy has been necessary. In the Malaysian public service, staff recruitment and selection into managerial positions is controlled by the Public Services Department (PSD), which is a central agency located in the Prime Minister's Department. When a position becomes vacant, whether at the federal, state, or local council levels, the PSD will seek to fill the post from the pool of officers available at the time. The functional requirements of the job almost always determine the criteria for selection (Trezzini, 2001). This procedure minimises the possibility that a person is selected into management on the basis of his/her prior levels of managerial tacit knowledge.

*Hypothesis 5: Subjects with accommodating learning styles who work predominantly in a management context will have a higher LAMTK than other subjects.*

Kolb and Fry (1975) argued that the possession of all four different abilities or learning modes (Concrete Experience, Abstract Conceptualization, Reflective Observation and Active Experimentation) indicated by the four poles of Kolb's (1984) model is critical for effective learning from experience. Later writings by Kolb (2000) also proposed newer research directions to look at the ability aspect of his Experiential Learning Theory, whereby an individual's ability to adapt to different learning styles in different circumstances is investigated. Unfortunately, there has been a dearth of studies in this area due to limitations imposed by the ipsative nature of the Learning Styles Inventory. The use of a normative version of the LSI adopted in this research, however, permits such an analysis. It is therefore hypothesised that:

*Hypothesis 6: Subjects with higher scores on all four learning abilities/modes of Kolb's (1984) model will possess a higher LAMTK than other subjects who scored low on all four points of the experiential learning model.*

In previous chapters, it has been argued that learning strategies would be more prevalent in formal learning as opposed to informal learning environments. One measure of learning strategy, the Learning Strategies Questionnaire (Warr & Downing, 2000) is used to measure declarative-knowledge acquisition and it taps learning strategies grouped into a three factor structure including 'mental learning strategies', 'behavioural learning strategies' and 'self-regulatory strategies'. The focus of the theory of learning strategies leans towards declarative knowledge, rather than tacit knowledge. This gives rise to the seventh hypothesis:

*Hypothesis 7: There will be no significant relationship between measures of learning strategies and LAMTK.*

## **5.6 Conclusion**

Throughout the literature review presented in this and the last chapter, a main theme that emerged is the question of why some managers appear to learn more from their experience than do others. It was proposed in this chapter that the style construct, or more precisely, learning styles can perhaps provide one explanation of why some people learn from their experiences more effectively than others.

An increasing amount of literature is now linking various forms of learning styles to tacit knowledge (e.g. Armstrong & Mahmud (under review); Hempen, 2002; Mahmud et al., 2004; Meyer, 2003). The field of management development has made huge strides to embrace the informal on-the-job forms of learning to enrich its repertoire of techniques beyond those offered through formal institutionalized training format. The style construct, it is argued, can offer the field an avenue to understand better the learning that takes place in professional contexts by linking it to a form of knowledge mostly associated with successful people and experts - 'tacit knowledge'. The next chapter will present discussions on the methods selected to answer the research questions developed in Chapter 1 and the research hypotheses outlined above.

## **CHAPTER 6**

### **RESEARCH METHODOLOGY**

#### **6.1 Introduction**

The broad aim of the present study is to examine the acquisition of managerial tacit knowledge from the learning perspective, and specifically the role of learning styles in relation to the levels of managerial tacit knowledge. Based on the research questions developed in the first chapter, a two-fold strategy was used to achieve this aim: exploratory, where the learning patterns associated with the acquisition of managerial tacit knowledge were investigated and confirmatory, where the exact relationship between learning styles and levels of managerial tacit knowledge was established.

The framework for the design of this research was anchored within the philosophical deliberations between the opposing cultures of inquiry - the quantitatively and the qualitatively inclined research traditions. This resulted in the employment of mixed method techniques to conduct the research. Further deliberations on various mixed method options were made before deciding the best approach to answer each of the five research questions.

#### **6.2 Cultures of Inquiry**

Research traditions within management and its sub-specialisms such as management learning and development do not escape from the fundamental debate between positivism and phenomenology (Easterby-Smith & Thorpe, 1997). Researchers'

philosophical stance for many years has been divided along these two paradigms of a quantitatively oriented and a qualitatively oriented inquiry culture. This bipolar division of research categorization draws from works such as those of Bryman (1984) and Guba and Lincoln (1982).

Similar to what Haas (1992) called epistemic communities, members of a culture of inquiry generally share a way of knowing, patterns of reasoning, and values. In the field of philosophy, the terms ontology and epistemology are used in studying how people come to know the world. Ontology is concerned with the nature of existence. It describes the reality a person holds to exist, the “filters through which we see and experience the world” (Allison & Pomeroy, 2000, p.92). This philosophical position or ontological commitment includes assertions and presuppositions about the existence of entities, substances, or beings (Kemerling, 2003).

Epistemology, coming from the Greek word *epistêmê*, meaning knowledge, is concerned with the theory of knowledge (Swartz, 1991). It has to do with how knowledge can be held about the world. Kemerling (2003) states that although the study on the theory of knowledge is traceable to the work of Plato in *Theaetetus*, Western Philosophy is mostly influenced by the works of Descartes (1596-1690) and Locke (1632-1704) as a debate between rationalism and empiricism. Rationalists believed that knowledge should be derived through reason (*a priori*) in order to attain knowledge on a firm foundation. Empiricists, on the other hand, hold that truth should be discovered through sense perception (*a posteriori*) to obtain significant information about the world.

Epistemological assumptions held by a researcher precede the choice of method adopted for a research. Grounding a research within a particular epistemology can reveal the nature of “truth” made in the research findings. This “truth” is inherent to the belief the researcher held about the “world” (Johnson & Duberley, 2000). Furthermore, any evidence provided by a research is bounded by the conditions and limitations of that particular epistemology (Venzin et al., 1998) and its acceptance as “usable knowledge” by the respective field (e.g. Fischer 1995; Lindblom & Cohen, 1979). In extreme cases, researchers within one epistemological position may view the position held by others as unintelligible (St. Pierre, 2000). In terms of research design, epistemology can help researchers in (Baldacchino, 2002):

- detecting researchable topics
- identifying research subjects and their role in the research
- selecting appropriate methods
- setting up the goals of the research and
- determining the manner in which the results are accepted.

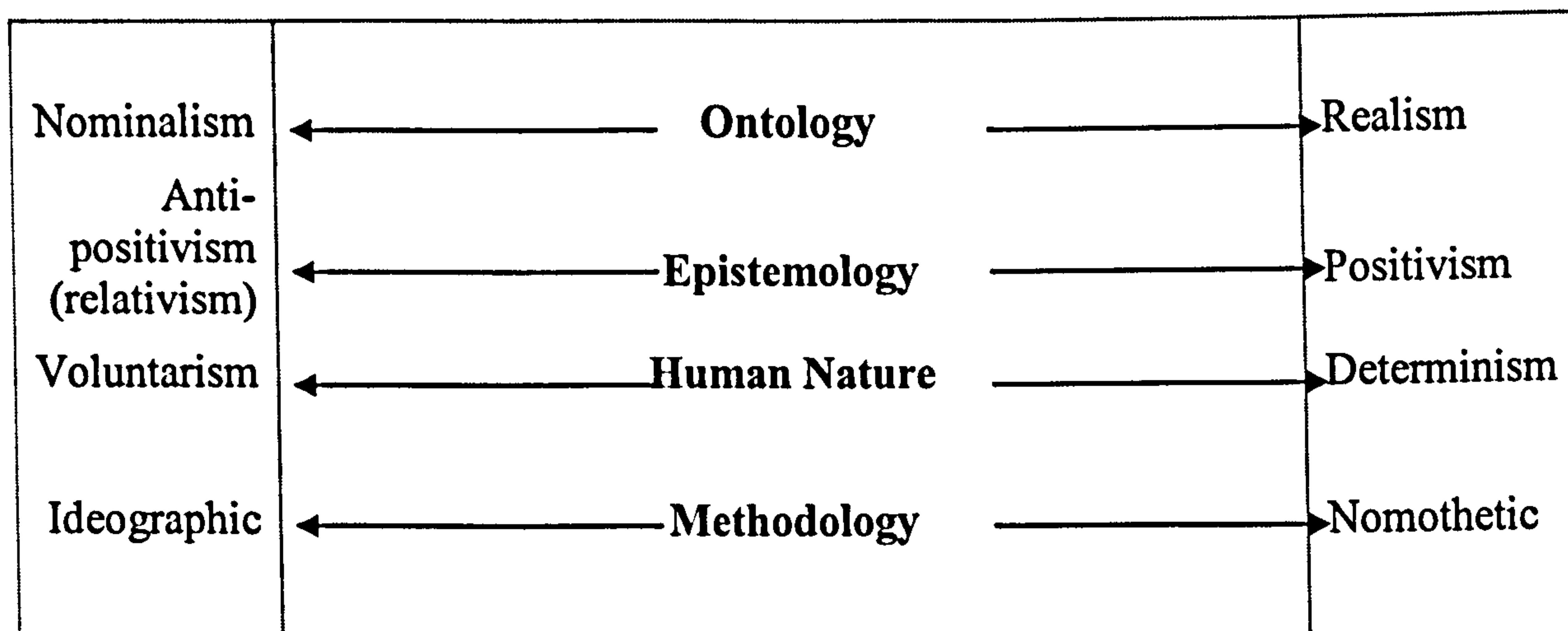
Methodology or theory about ways to study the social world is concerned with two main issues: methods that can be legitimately used to discover or produce knowledge and the legitimacy of the knowledge produced by using the specified methods (Livesey, 2003). It is not uncommon to find literature using the terms methodology and method interchangeably. However, Bryman (1984) differentiates methodology and method as belonging to different levels of analysis. Methodology is linked to epistemological position and is considered as a philosophical issue. Methods and techniques, on the other hand, relate to ways of gathering data involving the technicalities of data collection and are concerned with the actual tools used to conduct research.

Burrell and Morgan (1979) probably laid the foundation for the dichotomous view of social research when they described the extreme ontological, epistemological and methodological views that one could hold. At the ontological level, Burrell and Morgan suggest that the extremes at which 'true' rests are between it being the objective reality that can be found or truth being merely created by individual cognition and socially transmitted. Typically called realism versus subjectivism/nominalism, these ontological paradigms lead to extremes at the epistemological level between the view that universal laws on knowledge of the social world can be proved or disproved (objective) and the view that knowledge is subjectively held by individuals. Another name commonly used to describe these two epistemological positions is positivism and relativism. At the methodological level, Burrell and Morgan hold that the extremes are between positivist/nomothetic and interpretivist/ideographic.

Aligning the above extremities in philosophical stance along the ontological, epistemological and methodological levels results in a bipolar view as depicted by Remenyi (et al., 1998) in Figure 6.1. On one pole is what Burrell and Morgan called the sociological positivist and objectivist point of view while at the other end lies the subjectivist point of view. The objectivist pole is characterized by a realist ontology, positivist epistemology and positivist methodology (Hammersley, 1998). The subjectivist pole, on the other hand, possesses a nominalist ontology, anti-positivist epistemology and interpretivist methodology. The tendency to categorize discordance of ideas on worldviews in a bipolar fashion can actually be traced back

to the earliest of epistemological debates between the rationalists and the empiricists over the source of human knowledge (Kemerling, 2003).

Figure 6.1: Factors represented as polarities across a continuum



Source: Adapted from Remenyi et al., 1998, p.103

Bryman (1984) took a different perspective by drawing a line distinguishing between the diverse philosophical paradigms on method/technique grounds. He reclassified the commonly used groupings of positivism and interpretivism into a classification of quantitative and qualitative research methodologies. This draws from what the traditional linkage of positivism to quantitative methods of data analysis and interpretivism to qualitative methods of data analysis. Such a classification based on methods does provide some sense of the positional stance taken by the respective epistemological paradigms, but it is not intended to create a mutually exclusive classification for the whole range of ontological and epistemological positions available.

Bryman's quantitative-oriented inquiry culture will include Burrell and Morgan's (1979) sociological positivist and objectivist point of views. The ontological



assumption of a positivist in social science is that the structure of the social world is concrete (real). It exists on the outside and affects all people in the same way. Furthermore, the same type of people will react in the same way to this phenomenon. The epistemological assumption looks at the relationship between the researcher and what is being researched. The researcher is assumed to be independent of what is being researched and his/her role is to observe and measure social structures and the effects of changes in social structures (Remenyi et al., 1998).

For a long time, positivism has been the dominant epistemology in management and organizational research and is concerned with the establishment of universal paradigms (Jabri & Pounder, 2001). Young (1990) narrates its history beginning with the shift in the mode of reasoning within the natural sciences during the Scientific Revolution in the sixteenth and seventeenth centuries. Labelled as Positivism, this scientific reasoning migrated to human sciences at the end of the nineteenth century as evidenced in the principles of Taylorism and Fordism.

The basic tenets of positivism lie in empiricism. Jeffrey and Reed (2003) noted that positivism holds that the purpose of science is to study what is observable and measurable in order to describe the phenomena that can be experienced. Objectivity is paramount to positivists. Therefore, it is researchers' responsibility to eliminate their own bias in conducting research. Furthermore, subjective matters such as emotions and thoughts are seen as illegitimate topics for scientific research.

The qualitatively oriented inquiry culture encompasses the subjectivist point of view. In social research, this inquiry culture comes in the form of phenomenology,

postmodernism, hermeneutics, and feminism for example. This inquiry culture has very different and often opposing, ontological and epistemological assumptions from those of positivism, leading to it being labelled as “anti-science” (Turner, 1991, p.590). In contrast to the belief system of positivists, those within this culture of inquiry believe that people are not passive entities and they make up or construct their own social world. Research, to them, is not meant to understand events but is instead to understand peoples’ interpretation of those events. Also called “anti-positivists”, this group views the social world as essentially relativistic and attempts to understand it by comprehending the standpoint of the people who are directly involved with the phenomena under study (Burrell & Morgan, 1979, p. 5). Rejecting measurement, they use discovery instead and interact with the group under study. Examples of this can be found in work as early as the 1920s by pioneers in the field such as Bateson and Malinowski who introduced Ethnography as a fieldwork method whereby a researcher entered a foreign setting to study a different society and culture. The discussion presented here on the grouping of philosophical positions along research methods or techniques has implications to newer approaches in conducting research such as in mixed-method research.

The relative merits of the two cultures of inquiry have often been debated, with each claiming superiority over the other. The quantitative-oriented inquiry culture, especially positivism and its more current version, logical positivism, has been widely criticised. Being perhaps the most predominant epistemology, it invites a lot of attention, to the extent that much of the negative comment even seems unfair (Ruddock & Hopkins, 1985). However, the nature of some of the criticisms mirrors

the need to justify the existence of newer qualitative approaches as noted by Allison and Pomeroy (2000):

“Qualitative researchers are more likely to struggle for legitimacy than quantitative researchers” (p.93)

Criticisms revolve around the lack of relevance of these traditional approaches (Mintzberg, 1973) and the inability of positivism to account for the complexities of social phenomena (Bryman, 1984). Positivists counter their critics by asserting that the rival group are “non-scientific” (Eisenhart & Towne, 2003, p.31), have no way to verify their truth statements (Denzin & Lincoln, 2000), and lack a rigorous framework such as those of quantitative methods, a claim Boyatzis (1998) denounces as an incorrect impression of the interpretivist tradition.

The debate over superiority, relevance and validity between the two cultures of inquiry, dubbed the ‘paradigm wars’ seems endless (Miles & Huberman, 1994) and will probably continue in the future. However, an increasing number of researchers are becoming more aware that it is quite unlikely that either paradigm can claim dominance, since each has its own limitations and flaws. Despite both paradigms claiming validity over the other, the concept of validity itself is a social construct defined by the respective groups of researchers. Dewey (1938 cited in Willower, 1994) provides a plausible definition of validity. It involves providing “warranted assertions” in support of a researcher’s convictions (Thayer-Bacon, 2002, p.98). To those in the positivist camp, this points towards the evidence or arguments that support the universality or generalizability of assertions they made. This is often

implied in the precise use of quantitative techniques with tight controls on the research conducted.

On the other hand, the interpretivists are more concerned with 'local relevance'. Validity, to this group refers to accurate evidence and convincing arguments that can explain a complex social situation. Schein (1996), therefore points out that neither group should have the delusion that their paradigm is more valid than the other. Many researchers today acknowledge this fact. Taking advantage of all "valid" methods, researchers are suggesting the use of a variety of methods to obtain corroborating evidence (McGrath et al., 1982). Morgan (1998) echoed the same sentiment by suggesting the integration of both quantitative and qualitative approaches, utilizing the strength of one method to strengthen the other to achieve complementary results. Evidence from recent literature shows that an increasing number of researchers are adopting mixed method research by combining quantitative and qualitative techniques to address complex social and psychological phenomena (Evans & Hardy, 2002).

### **6.3 Mixed-method Research**

Easterby-Smith and Thorpe (1997) in evaluating the research traditions in management learning concluded that various methodological approaches have been adopted, despite most research still being inclined towards either the quantitative or qualitative paradigms with some attempting a more contemporary design such as the action research. According to Morgan (1998) among the earliest works that experimented with mixed-method approach were those by Campbell and Fiske (1959) and Webb et al. (1966). Despite these early efforts, most researchers still have

the tendency to stick to the dominant research practice in their area (Scandura & Williams, 2000). However, such rigidity was counter-productive, as evidenced in the comments by Midgley and McKinlay, quoted below. According to Midgley (1979);

“To become obsessed with a method for its own sake and try to use it where it is unsuitable is thoroughly unscientific” (p.103)

McKinlay (1992) adds that a researcher’s disposition towards a certain approach at the expense or to the exclusion of the other is

“...destructively parochial and results in often incomplete or even inaccurate explanations...” (p.111)

The basic philosophy behind the mixed-method approach is that the weakness of one method will be compensated by the strength of the other method (Morgan, 1998). Mixed-method permits the collection of multi-layered and multi-dimensional data from different perspectives that is crucial to the understanding of complex phenomena (Clarke & Yaros, 1988). However, mixing methods would have implications over philosophical issues and researchers are divided on the necessity to deal with this philosophical question. The first group chooses to ignore philosophical issues by regarding it as irrelevant, making no difference in practice except merely to “satisfy our highest ontological or theological aspirations” (Garrison, 1999, p.319).

The second group, on the other hand, believes in the relevance of philosophical paradigms to research. This is obvious in Morgan’s (1998) advice that basic paradigmatic assumptions need not be violated in pursuing mixed quantitative and qualitative methods for different but well coordinated purposes within the same

overall research project. However, this group found it problematic to synchronize the use of mixed methods with philosophical positioning. Many within this group adopted a mixture of both quantitative (positivist) and qualitative (interpretivist) philosophical positions to justify the use of mixed methods. However, it has been argued that in conducting research, holding different and conflicting paradigms will be problematic (Sale et al., 2002). The difficulty is exacerbated by the adoption of Triangulation in mixed method research. Triangulation requires the answering of the same research question or problem using multiple methods. This puts a demand on researchers not only to hold multiple philosophical paradigms but to hold them *simultaneously*.

Triangulation is an outgrowth of the mixed-method research. It takes a variety of forms, including theory triangulation, investigator triangulation and method triangulation. Theory triangulation involves the use of multiple propositions from competing theories, whereas investigator triangulation incorporates research teams with diverse perspectives and areas of expertise. When more than one research method or data gathering technique is used in research, this is called Method Triangulation. Pioneered by Denzin (1978) its primary aim is to validate research findings across methods to present a more complete account of social reality, and to reduce bias and validity threats (Bryman, 1988; Webb et al., 1966). The fundamental requirement of method triangulation is that the methods used must study the same phenomena (Denzin, 1970; Webb et al., 1966). This is done by cross-validating results on the same research question (Morgan, 1998) to observe convergence resulting in increased research validity (Kopinak, 1999).

Method Triangulation's requirement to use different methods on the same research question raises several pertinent issues. It would be easier to conceive triangulation within the same culture of inquiry rather than across different cultures of inquiry. For instance, Foster (1997) suggests for triangulation to use qualitative and quantitative research methods in a manner true to their underlying assumptions. These assumptions would entail the philosophical paradigms associated with both qualitative and quantitative methods. Furthermore, as methods are tied to different philosophical paradigms, there exists the possibility of obtaining unrelated or even conflicting findings (Morgan, 1998). In order to account for and comprehend the conflicting findings, the researcher will have to hold different world-views based on the two cultures of inquiry. The main question is whether it is possible for a person to hold two or more different philosophical paradigms, either simultaneously or not.

Nagle and Mitchell (1991) are sceptical about the ability of a researcher to hold conflicting world-views at the same time. Several reasons can be given for doubting a person's ability to hold two conflicting paradigms. It can be argued that any one person, based on his or her exposure, experience, training, and values will most likely be entrenched in one philosophical paradigm. A philosophical paradigm is akin to a belief system; holding one would exclude others (Harris, 1995). There are also other implications that would support this argument such as language-in-use and the issue of "warranted knowledge" (Johnson & Duberley, 2000). Most researchers and scientists are usually associated with a particular epistemic community or discourse coalition (Haas, 1992; Hajer, 1993). Within this grouping, they are bounded by the language-in-use (McKenzie, 2003), that is, the language researchers and scientists use in communicating their work. Philosophical paradigms and

positioning also play an important role in these groups. Therefore, it can be argued that by holding diverging paradigms a researcher might face a dilemma in deciding in what language to express their views. In addition, this discourse community also defines what constitutes “warranted knowledge”. Peers within this community form an influential group that determines the worthiness of any research effort (Remenyi et al., 2002). Within these communities, epistemological foundation plays a crucial part in determining warranted knowledge, which explains why so many positivists and interpretivists reject each other’s research findings (Anfara Jr. et al., 2002). The idea of a person conducting research and holding two philosophical positions is thus not too practical. This has implications for triangulation.

If the proposition above is true, it implies that one person can only hold a single paradigmatic position. The effect on triangulation can be observed from Midgley’s (1979) description of the concept using the metaphor of slicing a Swiss roll from different angles. A vertical cut reveals spirals; a horizontal cut reveals stripes. The otherwise contradictory findings, according to her, will be found to be true and valid after the slicing angle of the knife is understood. However, it can be argued that a person rooted in a particular paradigmatic position combined with its associated method (the one cutting with a certain angle) will most likely be able to comprehend findings made from the perspective of his or her culture of inquiry and be more sympathetic towards it. That same person would most probably have difficulty understanding and explaining the finding(s) made using the other method(s) as he or she does not subscribe to the other philosophy. Therefore, the value of Method Triangulation on the same research question by the same researcher is debatable. Instead, a better approach would be to conduct Method Triangulation in combination



with Investigator Triangulation. Then, different investigators each with their respective paradigms would use their respective methods and techniques to investigate the same research question. Only after findings are made can the two groups collaborate to find patterns in the results.

However, many situations call for a single researcher to carry out an inquiry. In this case, there are two conditions to observe. The first is that the researcher never actually 'changes positions' with respect to paradigmatic positions but merely appreciates the relevance of each in a certain context. Drawing from assertions made earlier, a person's philosophical paradigm is built from their life experiences over a period of time and he or she will usually be entrenched within one form or the other. To use methods associated with the other paradigm, a researcher needs to be sympathetic to the other philosophical position and appreciate its relevance to the research question concerned. Moreover, it will require conscious effort so that he or she will understand that the findings made are based on a totally different platform. Even then, caution should be exercised as controversy is still attached to the combination of both cultures of inquiry. Remenyi (et al., 2002) provides an excellent example for illustration with regard to content analysis. Content analysis is an evidence analysis technique linked to the qualitative school. Despite that, a positivist is more likely to use it for analysing qualitative evidence than an interpretivist, who will more likely use a comparable technique such as hermeneutic or linguistic analysis. The more deeply rooted a person is in a particular paradigm, the more difficult it will be to appreciate others' world-views. The present author proposes that such a suggestion is only viable if he or she holds a lesser degree of extremism on the subjectivist-objectivist continuum.

Referring back to the bipolar model of philosophical positions by Burrell and Morgan, it can be argued that Burrell and Morgan did not propose an 'extreme only' philosophical position. What Burrell and Morgan proposed was a positional choice along a subjectivist–objectivist continuum (Remenyi et al., 1998) as evidenced from their own description on the emergence of “intermediate points of view” in philosophical paradigms (Burrell & Morgan, 1979, p.8). These intermediate points bring the connotation of philosophical paradigms that hold a lesser degree of subjectivity or objectivity.

Softening an extremely objectivist or subjectivist view of the world is a first step towards appreciating the methods affiliated to the other group. The next step is to overcome the tendency to confuse philosophical issues with methods (Johnson & Duberley, 2000). This confusion is the result of the age-old attempts to synchronize philosophical positioning to methods. As mentioned earlier, Bryman (1984) observes the need to separate between philosophical issues (i.e. ontology, epistemology and methodology) and the technicalities of methods or techniques for data gathering and analysis. Machlup (1963 cited in Liebhafsky, 1985) even lamented the misuse of the terms methodology and methods:

“Methodology...is actually a branch of the philosophy of logic ...Those who use the word methodology to mean method or technique do not understand that the same method may be justified on very different methodological grounds and that from the same methodological position one may defend very different methods of research (p.204).”

By demarcating the two, researchers will be more tolerant to the views of the other paradigms and therefore would be more open to the methods traditionally associated

with their 'rivals', leading to a better acceptance of mixed method research. This is a logical step to take because irrespective of whether a person is positivistically or interpretivistically inclined, evidence from research does not come in a quantitative-only or a qualitative-only form, but both.

The second condition to apply when a single researcher carries out an inquiry is to approach a single research question from one methodological viewpoint. The reason, as mentioned earlier, is that a person can only hold a particular philosophical position at any one time. Even if he or she were to 'change positions' it would only be possible in relation to a different problem/phenomenon. What this research would propose is for different methods to be employed on different research questions based on the best method available for a particular research question. This proposal is made based on the suggestion for understanding a phenomenon by Allison and Pomeroy (2000) that despite the diversity in 'ways of knowing' there still are appropriate ways of knowing a particular phenomenon. Therefore, different research approaches "...are required in order to understand different aspects of different phenomena" (p.95). Trow (1957 cited in Bryman, 1984) says;

"...the problem under investigation properly dictates the methods of investigation (p.33)"

Hackman (1992 cited in Sankaran, 2001) echoed the same sentiment:

"The research question should drive the methodology... How often do we do the opposite? We take as a given whatever methodology we are comfortable with or skilled in using and then adjust our research questions to fit. And how many opportunities for learning we let pass by doing that".

Bryman (1984) sums up the debate by saying that no one technique is inherently superior to its alternatives and that a technique is more useful in some contexts than others.

#### 6.4 Choice of Method

Evans and Hardy (2002) cited Greene et al's (1989) article proposing several designs of mixed method research using both quantitative and qualitative techniques, including from triangulation, complementarity, development, initiation, and expansion. Triangulation and complementarity involve using both methods to understand the same phenomenon. Paradigmatic issues, however, plagued this approach as argued above. Development, as its name suggests, takes into account the findings of the first method to strengthen further the design of the second method. In initiation, both methods are used to discover inconsistencies and contradictions and are useful in redesigning the research framework. Expansion, on the other hand, uses different methods for different inquiry components in order to extend the breadth and range of inquiry. This design is most appropriate to the aim of the current research. Applying different methods to different research questions, this research aimed not just to investigate the possible linkage between learning styles and levels of managerial tacit knowledge but also to observe the broader picture with respect to learning involved in the acquisition of managerial tacit knowledge.

Following from the arguments presented earlier, the researcher examined each research question in an effort to find the most appropriate method (Tashakkori & Teddlie, 1998). The first and second research questions display the need for rich, in-

depth information concerning how managers 'learn' the managerial tacit knowledge that they possess. The problem posed is quite broad and the phenomenon being explored is rather tacit, requiring deep probing into the respondents. Fitting these research questions best is a qualitative technique. It permits inquiry into the experiences from the respondent's perspective and preserving the social context necessary to understand the phenomena (Silverman, 2000).

At least one example of tacit knowledge was elicited from each respondent. Once elicited, further detailed exploration was carried out in order to understand the learning associated with the tacit knowledge. The specific aims were to find out:

- i) If the learning involved in the acquisition of tacit knowledge comes from experience or from formal sources,
- ii) To what extent the respondents make conscious attempts to use their experience to help them tackle practical problems on a daily basis and
- iii) Whether they make a conscious effort to learn from those experiences

To attain this, an in-depth interview protocol based on a combination of the Sense-Making Technique (Dervin, 1983; 1992) and Critical Incident Technique (Flanagan, 1954) was used. The same combination was used in previous research by Nestor-Baker and Hoy (2001) on school superintendents. Both methods are well-known qualitative data gathering techniques that have been proven useful in elucidating the complex nature of variables under investigation in the current research.

The essence of the remaining research questions centred on the same core: investigating relationships. A correlation study using quantitative methods is most

appropriate, as the main purpose of this research is to understand a specific phenomenon, the influence of learning styles on the level of managerial tacit knowledge. A straightforward test correlating measures of learning styles and tacit knowledge enabled the researcher to look at the relationship between the two.

Earlier, it was argued that considering paradigmatic concerns, it is necessary to ground the research's philosophical foundation in accordance with the researcher's background. Following this, the current research was therefore positioned within the positivistic school of thought. Two more issues then had to be addressed before proceeding further in applying mixed methods. These were the primacy and order of the two methods. One model, the Priority Sequence Model (Morgan, 1998; Morse, 1991) addresses both issues. It contains certain rules that many researchers believe must be observed to refine further the mixed method framework. Based on the notion that integration of methods is prone to complications, the model proposes the following two steps. Firstly, it is necessary to identify which of the two will be the principal method and which will be the complementary or supplementary method. Secondly, a sequencing decision is required as to which will be the preliminary and which will be the follow-up method. It is claimed that these steps are able to alleviate the problem of analysing the combination of data in a coherent manner (Morse, 1991) and counter the threat of contradictory findings.

The priority aspect of the Priority Sequence Model bears relevance to the current research with reference to the philosophical deliberations made earlier. In this respect, the quantitative approach was given priority as the principal research method

by virtue of positivism being the dominant paradigm held by the researcher. As to the sequence of the methods, the situation in the current research did not necessitate a decision on this point. Because the methods were linked to different research questions, they were therefore independent of each other and the obvious sequence to follow was the order of the research questions themselves. This view is partly supported by the presence of evidence (e.g. Rocco et al., 2003; Stange et al., 1994) that quantitative and qualitative techniques can be used either sequentially or concurrently.

## **6.5 Conclusion**

In conclusion, the present research was conducted using a cross-sectional, mixed-method study incorporating both qualitative interview and survey data analyses. The in-depth interview explored the nature of learning associated with managerial tacit knowledge. This was followed by a survey to confirm the various relationships predicted in the research questions. This decision came as a result of philosophical deliberations that formed the framework for methodology selection for the present research. One main point made was that the choice of method should not supersede the probing of research questions, as this would otherwise impede the scope and breadth of the latter. Both methods addressed research questions separately, based on the best method for each research question. They were conducted on a concurrent basis with both yielding separate findings. The conclusion chapter will integrate findings of both methods in the hope of establishing a comprehensive pattern of learning associated with LAMTK.

## **CHAPTER 7**

### **RESEARCH DESIGN**

#### **7.1 Introduction**

In the discussions on methodology in the last chapter, it was concluded the best way to approach the study is by choosing the best method for each of the research questions. This chapter will present the research design, research instrumentation, and the procedures used in conducting the present study. It will be structured according to the two respective components of the research: qualitative and quantitative.

#### **7.2 The Qualitative Phase of the Study**

The purpose of this phase was to answer the first two research questions, concerning learning patterns associated with possession of managerial tacit knowledge. The main inquiry instrument used in this phase was the semi-structured in-depth interview. In order, as a first step, to elicit examples of managerial tacit knowledge from participants, techniques used by Nestor-Baker and Hoy (2001) were adopted, involving a combination of the Critical Incident Technique (Flanagan, 1954) and the Sense-making Technique (Dervin, 1983; 1992). Although several features of the method used here followed Nestor-Baker and Hoys' example, this research was not, however, concerned with capturing all forms of managerial tacit knowledge, but merely with eliciting some examples of it. The main focus was on investigating the learning patterns associated with the acquisition of managerial tacit knowledge.



In view of the complexity of the variables under investigation and to facilitate the analysis of data, several contextual elements were controlled. The first concerned the research participants. Selected participants were those with working experience as managers within the same organization. This was to ensure that research participants would have been exposed to the intricacies of managerial work, while controlling the context and environmental surroundings in which managerial tacit knowledge acquisition took place. The next element to be controlled was the type of managerial tacit knowledge to be elicited, in order to keep the research manageable. As stated previously, three types of tacit knowledge are important for a successful managerial career: managing career, managing self and managing others (Wagner & Sternberg, 1985). For this reason, the current research was limited to these three types of tacit knowledge.

### **7.3 Research Instruments for the Qualitative Phase**

#### **7.3.1 Interview Protocol**

An interview protocol was used as a basis to guide all the interviews. It was largely based on the protocol developed by Nestor-Baker and Hoy (2001). Changes were made to accommodate the requirements of the current research by including protocols to locate learning patterns associated with the accumulation of managerial tacit knowledge. Three forms of questions, namely key questions, supplementary questions and probing questions, constituted the bulk of the protocol. The protocol began with an introduction to the research, followed by some background questions.

Then, key questions were listed. These were aimed at eliciting critical incidents that the participants had experienced.

The first key question was aimed as an icebreaker and to get the participants into the mood to talk. It also helped to orient the participants to the main theme of the interview. For example, a question on managing others:

- How important to you is the interaction with your peers, subordinates and superiors in your daily work? Please elaborate this further.

This question is then followed by questions specifically using critical incident to extract at least one incident that had left an impact on the participants. Again, using managing others as example:

- Can you recall any incident with any of them that, as far as you are concerned, was important to you in terms of teaching you how to deal with others in your position as a manager?

All the respondents managed to come up with at least one incident. However, the researcher had prepared beforehand, a copy of scenarios (managing self, others, and career) from the Tacit Knowledge Inventory for Managers (TKIM) as a contingency measure, in case they did not come up with any incident of their own. Should the need arise, the scenarios could be used to extract incidents of managerial tacit knowledge from the participants.

Nestor-Baker and Hoy (2001) explained how tacit knowledge is identified from explicit statements and inferences made by interviewees. The researcher first looks for goals or end-states which participants sought to achieve in dealing with the incident. These can be uncovered by asking supplementary questions. For each goal, the researcher then seeks the knowledge that was used to act on it. This represents knowledge about how to do something. It is procedural in nature and is a key characteristic of tacit knowledge.

Further probing was then performed in the present study to understand the forms of learning associated with the knowledge exhibited by the participants. Examples of questions used for this purpose are; “How do you come to know about this?”, “Where do you learn that technique?” and “Could you tell how you would teach this to your subordinate or mentee?”

## **7.4 Research Procedures for the Qualitative Phase**

### **7.4.1 Participant Selection**

The selection of research participants was limited to a single organization for contextual reasons, as explained above. INTAN, an acronym for the National Institute for Public Administration of Malaysia was chosen for the study. Reasons for making this choice were as follows:

- Daily managerial activity in INTAN is typical of a public sector agency in Malaysia, making it a valid choice for the current research

- INTAN is a typical Malaysian public sector organization in terms of size and personnel mixture and it also has an adequate number of members in managerial positions
- The researcher, being a member of the organization, has experience of working there, which helped in obtaining permission to conduct the research from top management. It also facilitated obtaining support and participation from its members
- The choice of INTAN helped to meet time and travel constraints during the fieldwork, bearing in mind that the research also involved a survey, and finally
- It helped to integrate the findings of the qualitative and the quantitative phases of the research, because the quantitative phase was also done at INTAN. This contributed towards a coherent conclusion being drawn from the research.

At the time of the fieldwork, INTAN had more than 400 employees, of whom 106 were at the management level. A review of INTAN'S personnel inventory indicated that there were 1 Director, 2 Deputy Directors, 7 Regional Campus Heads, 7 Programme Heads, 40 Senior Project Coordinators and the rest Project Coordinators. After obtaining permission from the management of INTAN to conduct research, potential participants were approached, beginning with the most senior position downwards. The process stopped after twenty-three persons had agreed to participate. This number was considered sufficient and manageable for in-depth interviews within the fieldwork period. However, by the end of the fieldwork, 9 participants had dropped out for various reasons leaving a total of fourteen people fully interviewed. The fourteen participants ranged in age from thirty-eight to fifty-four. One of the participants was a Regional Campus Head, another one a

Programme Head, while the rest held the positions of Senior Project Coordinator and Project Coordinator. Profiles of the fourteen participants are shown in Table 7.1.

**Table 7.1: Profile of interview participants**

	Job Title	Gender	Age	Years in INTAN	Years in Public Service
Participant 1	HP	F	54	15	25
Participant 2	RCH	M	53	12	23
Participant 3	SPC	M	52	8	22
Participant 4	SPC	M	46	9	17
Participant 5	SPC	M	48	13	19
Participant 6	SPC	M	47	8	19
Participant 7	SPC	M	47	7	20
Participant 8	SPC	M	48	15	23
Participant 9	SPC	M	52	7	24
Participant 10	SPC	M	46	8	16
Participant 11	SPC	F	44	10	13
Participant 12	SPC	M	43	9	12
Participant 13	SPC	F	55	19	25
Participant 14	PC	M	39	10	12

Note: HP = Head of Programme; RCH = Regional Campus Head; SPC = Senior Project Coordinator; PC = Project Coordinator

#### 7.4.2 The Interview Sessions

Appointments were made for a separate one-to-one interview with each participant. At the time of arranging the appointments, a brief was given to the participants, giving a general outline of the research. This was intended to capture the participant's interest. It also contained statements of confidentiality with regard to the recording of the interview sessions. All the interviews were conducted between July 2003 and October 2003. They ranged in duration from half an hour to two and a

half hours. The interviews followed the participant's pace and some of the interviews finished within the same day, whereas others were spread over a period of two days.

Interviews were conducted at the participant's own office so they did not feel detached from their working environment and to put them more at ease. The researcher began by asking the participants if they had any questions about the interview, the research, or the brief that was handed to them earlier. Permission was then requested for the interview to be tape-recorded. Response varied from those that did not mind at all, to those that said they felt uncomfortable at the thought of being tape-recorded. However, the latter group insisted that the recorder need not be turned off, despite being offered this opportunity by the researcher. This is probably because the participants knew the researcher as a former colleague. Both English and Malay were used in the interviews, depending on the preference of each participant. Six of the participants spoke in English while the remainder chose Malay.

## **7.5 Analysis of the Qualitative Data**

The interview sessions were transcribed verbatim. This was a laborious process, taking a substantial amount of time. A copy of the transcription was e-mailed to the respective participants for their endorsement. Ten participants accepted the transcripts in full, whereas four participants made alterations, additions or omissions; one rather significantly whereas the other three made only small changes. For example, Participant 5 changed some parts he described as 'misconstrued perception' on the researcher's part and suggested that he had not meant to imply that his former

boss was an incapable manager but merely that difference in styles was the reason to blame for their fallout. Other amendments involved minor corrections such as filling in gaps in the transcription caused by inaudible recording. Two volunteers checked the transcripts produced for validity purposes. Copies of the transcripts along with the tape recordings were given to the volunteers, who were told to check approximately ten percent of the transcripts. These procedures were followed rigorously to ensure the suitability of the data for analysis.

Data obtained from the interview transcripts were then analysed. First, instances of managerial tacit knowledge were captured by adopting the technique used by Nestor-Baker and Hoy (2001). They used what they called “if-then-because” statements (p.96) to code instances of tacit knowledge. According to them, the “if” in the “if-then-because” statement represents the antecedent condition, the “then” represents the action(s) taken in response to the “if” and the “because” represents the reason for the action. They claimed that using this framework to code responses by the participants could uncover solution processes (Leithwood & Steinbach, 1995), schemata for performing certain actions. Since solution processes display a procedural disposition, the knowledge on which the action was based is arguably tacit in nature.

One problem discovered with the interview process was that there were cases where the researcher omitted to follow-up with further probing on instances of tacit knowledge expressed by the participant during the interview. Only after analysing the transcripts did it occur to the researcher that the participant was expressing

procedural knowledge. As a result, the researcher contacted seven of the participants again by telephone, to further probe the learning associated with the managerial tacit knowledge that was uncovered during the analysis.

While Nestor-Baker and Hoy's interview sessions stopped after as many tacit knowledge instances as possible had been gleaned, the current research went further to probe the associated learning paths. This situation represents a gap in the interview procedure that needed to be bridged. Sense-making techniques (Dervin, 1983) were used to meet this need. Cooper and Sawaf (1996) argued strongly for sense making, saying that it permits deep probing; therefore providing access to understand learning that is associated with proceduralized behaviours.

## **7.6 The Quantitative Phase of the Study**

The quantitative phase of this research was operationalized through a field survey with the aim of answering the other three research questions framed earlier. The three research questions were further developed into seven hypotheses, revolving around the relationship between learning styles, learning strategies and levels of managerial tacit knowledge. This section will present the process of developing the questionnaire and the procedures involved in administering it.

The development process was guided by the goal of designing a questionnaire simple enough to encourage targeted respondents' participation, yet complete enough to collect data of sufficient accuracy and detail to address the hypotheses developed. The design of the questionnaire consisted of a demographic section that included



several control variables, and measures of the dependent variable and independent variables.

### **7.6.1 Demographic Information**

A variety of demographic characteristics were captured in this section. These include background information in the following order:

- gender
- age
- current department's name
- service classification (nineteen in total in the Malaysian public sector including Engineering, Medical and Police)
- scheme of service
- job grade
- highest level of education
- field of study
- a table listing a respondents' last five job titles, whether those jobs involve performing mainly managerial or non-managerial functions and the periods in those positions
- number of subordinates under supervision and
- if the respondent had ever been awarded a Service Excellence Award.

Based on previous research findings on the correlates of managerial tacit knowledge, some of these demographic variables, which exhibited significant correlations with such knowledge, were designated as control variables. It was expected that the current research would exhibit results consistent with previous research with respect to these variables.

From Table 7.2, no single variable consistently shows significant correlations to tacit knowledge. However, three of the variables- management experience, management level and level of education displayed satisfactory correlations to tacit knowledge and were selected as control variables. Salary, despite showing strong correlations, was not selected, as it is quite irrelevant with respect to public sector. Within the public sector and especially the Malaysian public sector, salary is a function of length of service and rank. Middle managers varied little in their salary as all were governed by the same salary scheme and structure. This is in contrast to those in the business sectors whereby salary is a form of reward for successful employees (e.g. Hitt et al., 1994; Kubo & Saka, 2002).

The domain-specific nature of tacit knowledge tests has been stressed by its authors as an important characteristic of the instrument (Wagner, 1987; Wagner & Sternberg, 1985) and has been proven in several studies (e.g. Powell, 1988). This pattern should be obvious from the service classification variable in the current research, which depicts the different service sectors in the Malaysian public service from administrators to lawyers and military personnel. For this reason, service classification was also taken as a control variable. The nineteen service classes come in five major service groups, namely, Management/administration, Technical (e.g. Engineering, Science, and Information system), Security (Military, Police), Services (Transport, Medical, Education) and Social.

**Table 7.2: Managerial tacit knowledge correlates**

Variable	Correlation with tacit knowledge	<i>N</i>	Notes
Gender	0.05 <sup>i</sup>	157	
Age	-0.22 <sup>b</sup>	80	
	0.12 <sup>d</sup>	50	
	Not significant <sup>e</sup>	n.r.	
	0.28 <sup>i</sup> **	157	
Education	0.41 <sup>c</sup> ***	54	Schooling beyond high school
	0.37 <sup>e</sup> ***	n.r.	Higher education (years)
	0.41 <sup>h</sup> **	48	Business education
	-0.11 <sup>h</sup>	48	Attended college
	0.15 <sup>i</sup>	157	
Salary	0.46 <sup>c</sup> **	54	
	0.21 <sup>d</sup>	48	
	0.39 <sup>e</sup> ***	n.r.	Compensation
	0.48 <sup>g</sup> *	22	Percent salary increase
	-0.17 <sup>i</sup> *	157	
Job Level	-0.27 <sup>a</sup>	54	Academic rank
	0.14 <sup>c</sup>	54	Level of job title
	0.36 <sup>e</sup> ***	n.r.	Level of position
	0.21 <sup>j</sup>	51	Military rank - Platoon Leader
	0.44 <sup>j</sup> *	42	Military rank - Company Commander
	0.41 <sup>j</sup> *	37	Military rank - Battalion Commander
Management experience	-0.41 <sup>a</sup> **	54	Percent time in administration
	-0.19 <sup>b</sup> *	79	Percent time in administration
	0.21 <sup>c</sup>	54	
	0.30 <sup>d</sup> *	49	
	Not significant <sup>e</sup>	n.r.	
	0.05 <sup>i</sup>	157	Years managing at 'that' bank
Employees supervised	0.10 <sup>c</sup>	54	
	0.04 <sup>i</sup>	157	Employees supervised directly
Number of different departments	0.35 <sup>e</sup> ***	n.r.	Companies worked for

Adapted from Gottfredson (2003)

Notes: 1. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

2. n.r. = not reported.

3. Criterion-related measure of performance is included to show examples of other research besides those by the Sternberg group indicating predictive ability of the TKIM

<sup>a</sup> Wagner & Sternberg (1985); sample involved Academic psychologists

<sup>b</sup> Wagner (1987); sample involved Academic psychologists

<sup>c</sup> Wagner and Sternberg (1985); sample involved Business managers

<sup>d</sup> Wagner (1987); sample involved Business managers

<sup>e</sup> Sternberg et al. (2000); sample involved three levels of managers

<sup>f</sup> Wagner and Sternberg (1990); sample involved managers in leadership training

<sup>g</sup> Wagner and Sternberg (1985); sample involved Bank managers

<sup>h</sup> Wagner et al. (1999); sample involved salespeople

<sup>i</sup> Colonia-Willner (1998); sample involved Brazilian Bank managers

<sup>j</sup> Hedlund, Sternberg, & Psotka (2001); sample involved military leadership

Background information of particular importance that was sought from the respondents included their last five job titles, classified into whether those jobs involved performing mainly managerial or non-managerial functions. Appendix E details the process of classifying these two groups of respondents. This information, together with other data collected through Question 9 of the demographic section, provided data for testing three hypotheses. The first was hypothesis 3, concerning the context-dependency of tacit knowledge. This question was also designed to tackle hypotheses 1 by inquiring into the length of time each position was held by the respondents. Another hypothesis addressed by this question was hypothesis 4, which suggested that levels of managerial tacit knowledge would be higher in subjects with an accommodating learning style that matched with the performance of predominantly managerial functions. Question 10 asked respondents if they had ever been awarded the Service Excellence Award in the last three years. This question was specifically asked to differentiate those among the respondents who were defined as “successful” or expert. Profiles of experts were needed to cater for the

unique scoring system of the Tacit Knowledge Inventory for Managers (TKIM), which is discussed further below.

### **7.6.2 Levels of Accumulated Managerial Tacit Knowledge (LAMTK)**

The dependent variable for this research was the level of managerial tacit knowledge accumulated by the managers. An adapted version of Wagner and Sternberg's instrument, the Tacit Knowledge Inventory for Managers (TKIM) (Sternberg et al., 2000) was used for this purpose. The scope of this research was confined to the levels of managerial tacit knowledge of which the content was predetermined in the TKIM. Wagner and Sternberg (1985) developed the Tacit Knowledge Inventory for Managers (TKIM) by using the critical incident technique. According to Forsythe et al. (1998) the inventory focuses on three core categories of *managing self* (maximizing self-performance and productivity), *managing others* (working with, and directing others), and *managing career* (establishing and enhancing self-reputation). It defines the scope of tacit knowledge based on the content of a situation. Even though it can be argued that this content is minimal compared to the entire spectrum of managerial tacit knowledge available in a manager's repertoire, it was sufficient for the purposes of the present research. This is because the objective of the present research was not to examine the whole list of managerial tacit knowledge but to sample aspects of managerial tacit knowledge and to focus on the learning associated with its acquisition.

Nine scenarios are depicted in the TKIM, designed to elicit different responses from different individuals. Theoretically, experts are expected to respond differently from novices, due to the content and organization of their tacit knowledge (Wagner et al.,

1999). The majority of previous studies have focused on differences between the responses to the scenarios made by novices and experts. Such differences were correlated with measures of job performance to determine whether or not a significant relationship exists. The present study, however, was concerned with establishing whether or not differences between expert and novice groups measured using the TKIM are associated to individual differences in learning styles and the context of managerial experience.

Scoring on the TKIM is made by reference to expert prototypes, also referred to as expert-novice comparison, whereby the tacit knowledge test scores of the subjects under study were compared to the mean scores of the identified experts (the detailed explanation on scoring the TKIM is presented in Appendix G). The identification of experts in this study deviated slightly from previous ones. Previous studies of tacit knowledge in the professions have identified experts as those who are senior, highly successful and very experienced managers, often irrespective of the management context (e.g. Kerr, 1991; Klemp and McClelland, 1986; Wagner and Sternberg, 1987; Williams, 1991). The present study argued that managerial tacit knowledge is context-specific and has a certain life span (Argyris, 1999). Tacit knowledge, which brought success to individuals within a given context, may not be a suitable indicator of expert management in different contexts. In this study, therefore, management experts were considered to be those who stood out as highly successful within the same work context as the subjects being studied (i.e. within the Malaysian Public Sector). The criterion for identifying such experts was whether they had received the Service Excellence Award for management in the past three years.

Candidates for this award are chosen from among all Malaysian Public Sector management employees, based on their annual appraisal, achievements and superior's recommendation. The annual Service Excellence Award is a requirement for every Malaysian public sector department. A central committee from candidates' departments decides who should be put forward for this award, based on candidates' annual appraisals. Candidates undergo a rigorous selection process and the number of awards never exceeds five percent of the population under the purview of each awarding committee.

Sternberg et al., (2000) dedicated an entire chapter in their book to explaining the construction of their tacit knowledge measures. Within this, they discussed the validity mechanisms they applied in the development of the inventories. These include the content, substantive, structural, generalizability, external and consequential aspects of validity.

Table 7.3 shows Cronbach's alpha coefficient ranging from a low of 0.68 (Wagner & Sternberg, 1985) to a high of 0.85 (Colonia-Willner, 1998). On average, the validity measures are fairly satisfactory, with Sternberg et al., (2000) showing evidence of validity measures that averaged around 0.3, although Gottfredson pointed out a couple of studies showing mixed outcomes in predicting success using the tacit knowledge measure (Table 7.3).

**Table 7.3: Reliability and validity of managerial tacit knowledge**

Publication/ Report	<i>N</i>	Alpha reliability	Job outcome criteria	<i>N</i> -weighted <i>r</i> 's for criteria and TK*
Wagner & Sternberg (1985)	54	0.68	Level of company prestige, salary, job title; <i>N</i> of employees supervised	0.26
	29	n.r.	% salary increase, rated performance in personnel, new business, policy, and overall	0.42
Wagner (1987)	64	0.79	Level of company prestige, salary	0.13
Wagner & Sternberg (1990)	45	n.r.	2 small-group management simulations	0.61
Williams & Sternberg (undated)	n.r.	n.r.	Level of position, compensation, age-controlled compensation, satisfaction	0.34
Colonia-Willner (1998)	157	0.85	Salary, <i>N</i> of people supervised, rated performance, composite index	0.06
Hedlund et al. (1998)	368	n.r.	3 peer and 3 supervisor ratings of leadership	0.02
	163	n.r.	3 subordinate, 3 peer, and 3 supervisor ratings of leadership	-0.09
	31	n.r.	3 subordinate and 3 peer ratings of leadership	0.13

Source: Gottfredson, (2003a)

n.r. = data not reported

\* Gottfredson used Pearson's *r* corrected for sample size to report correlation between tacit knowledge with job outcome criteria.

The demographic variables gender, age, service classification, job grade (level), level of education, managerial experience, and number of subordinates were included as independent variables. As mentioned above, service classification, job level, level of education and managerial experience also doubled as control variables. The other independent variables were learning styles and learning strategies.



### 7.6.3 Learning Styles

The role of learning style in the acquisition of managerial tacit knowledge was the main theme and interest of the current research. In the previous chapter, based on evidence from the literature, it was argued that the acquisition of tacit knowledge is correlated to a person's preferred way of learning. Relating this evidence to the claim that tacit knowledge is acquired from experience, a further proposition was developed, that the concept of learning styles can be associated to a person's level of accumulated tacit knowledge. Kolb's (1984) experiential learning theory provides a suitable framework to test this proposition. Its associated measure, the Learning Style Inventory (LSI) was developed to measure a person's propensity for a certain style in learning from experience.

The LSI consists of twelve statements representing learning situations. Respondents are asked for each to rank-order four sentence endings that correspond to four learning styles. Kolb et al., (1999) describe the development of the LSI, which was first developed in 1971, and first published in 1976. This first version of this inventory was criticised for the low internal consistency of the scales, and their test-retest reliability. These criticisms led to the development of the second version of the LSI (Smith & Kolb, 1986) where internal consistency of the scale was reported to have been improved, but critics continued to report problems with test-retest reliability. This was finally resolved with the release of the most recent version, the LSI-III, when Kolb et al. (1999) reported:

“...randomising the order of the LSI-II items has resulted in dramatic improvements in its test-retest reliability” (p.6)

The LSI is based on ipsative scales. Ipsative scales were designed to counter problems in the use of normative measures such as social desirability and faking (Bowen et al., 2002). Socially desirable response involve an overly positive self-description (Paulhus, 2002) and this happens because respondents are able to see through the intention of the questions presented (Rosse et al., 1998). Faking, on the other hand, was described by Paulhus (1991) as the tendency for “self-presentation tailored to an audience” (p.21).

A major justification for the use of ipsative scale in the LSI is the need to maximize differences within the measure (Geiger et al., 1993). Kolb’s underlying Experiential Learning Theory explains individuals’ relative abilities to learn (also called modes of learning) along the dimensions of CE (feeling), RO (watching), AC (thinking) and AE (doing) (De Ciantis & Kirton, 1996). Most individuals possess the ability to learn, albeit at different levels, on each of these dimensions. However, the LSI’s main intention is to measure an individual’s preference in learning style. Therefore style constructs are derived from the ability dimensions by combining two distinct ability dimensions into a style. To observe a dominant style in a person an ipsative measure will then be the most appropriate scaling technique.

However, criticisms of some of the previous studies using the LSI have been levelled at the deficiency and limitations of ipsative measures. Many different researchers have recognized the difference between ipsative and normative measures (e.g. Bowen et al., 2002; Gordon, 1976; Johnson et al., 1988; Cornwell & Dunlap, 1994; Clemens, 1966; Gorsuch, 1974; Tenopyr, 1988). Ipsative measures produce ordinal data (Baron, 1996) and this limits the nature of the methods of study that may be

used to determine an instrument's validity and compare it with other instruments (Bartram, 1996). Estimating the reliability of ipsative measures was also shown to be problematic (Tenopyr, 1988).

Previous researchers have often proceeded to correlate ipsative scores with normative data. This is known to be controversial (Higgs, 2001). Correlational studies using ipsative measures with other categorical variables would require each cell to have a minimum of 5 observations per cell for a chi-square test, thereby necessitating large sample sizes (Norusis, 1994). Furthermore, there have been studies showing that correlational analysis using ipsative measures including correlation-based procedures such as factor analysis are prone to errors (e.g. Cornwell et al., 1991; Dunlap & Cornwell, 1994; Hicks, 1970; Johnson et al., 1988).

Attempts to create and study a normative form of the LSI were first undertaken by Romero et al. (1992) and Geiger et al. (1993). Geiger et al. (1993) converted the 12 items (with 4 endings) on the LSI into an independent, randomly ordered 48 item questionnaire. Each item was scored on a 7-point Likert scale of "*not like me - very much like me*". However, taking into account that by changing the structure of the LSI, its psychometric properties would also change, statistical procedures were used to compare the ipsative and normative forms of the LSI that revealed strong support for the same learning style preferences theorised by Kolb in both measures. Consistent and strong reliabilities for the randomised normative version were also noted consistent with Kolb's assertion that the latest version of the inventory, the LSI-III, gained considerable reliability by "randomising the order of the LSI-II items" (Kolb et al., 1999; p.6). Despite Geiger's inability to find any bipolar

dimensions in the normative version, this however can be explained by the fact that bipolarity is known to be conflated by ipsative measures (Baron, 1996) that produce negative correlations. Geiger also found strong support for the four separate learning abilities theorized by Kolb and the Experiential Learning Model.

The above findings provide support that a normative version of the LSI, besides providing “richer” data, by allowing the strength of preference for each style to be observed, also does not compromise the psychometric properties underlying Kolb’s Experiential Learning Theory. Additionally, a normative version would permit the collection of both elements of experiential learning: style and ability. Therefore, due to the nature of the present study, a normative version of the LSI was adopted (the detailed explanation on scoring the normative LSI is presented in Appendix H). To add to previous findings, this study performed psychometric analysis on the normative version of the LSI to observe if it supports the theorized Experiential Learning Model.

#### **7.6.4 Learning Strategies**

The last of the independent variables is learning strategy, developed from Warr & Downing’s (2000) Learning Strategies Questionnaire. The instrument was originally developed from Warr and Allan’s (1998) version, which was designed to measure learning strategies defined as a three-factor structure. The structure comprised mental learning strategies, behavioural learning strategies and self-regulatory strategies. Learning strategies was used in the present study to test for the independence of learning styles in predicting tacit knowledge. Learning strategies is associated with declarative-knowledge acquisition, and is therefore not expected to be correlated

with levels of managerial tacit knowledge. Warr & Downing's (2000) learning strategy items, originally based on a Likert scale of 0 to 4, were administered as a 7-point scale in the present study, for reasons of consistency.

### **7.7 Further Development of the Questionnaire and its Reliability and Validity Characteristics**

Once the main components were identified and combined, the questionnaire underwent several phases of further development, which included translating it, and assessing its reliability and validity. Translation was done in two separate stages, first by peers followed by a validation process by a professional translator. The strategy for establishing reliability and validity for the research questionnaire was three-pronged. The first stage was to examine literature for evidence of reliability and validity for the three main components of the questionnaire, namely the Tacit Knowledge Inventory for Managers, the normative version of the Learning Style Inventory and the Learning Strategies Questionnaire. However, because all three questionnaires are relatively new, published evidence of reliability and validity is very limited.

The second strategy was to make use of statistical tests on data from the pilot study and the final survey. Two distinct groups, management experts and representatives of target audiences did the review of items, as the third strategy of instrument validation. Management experts, different from the experts defined for the purpose of scoring the TKIM, were chosen from senior civil servants with vast experience in the Malaysian public sector. On the other hand, representatives of target audiences that

were used for the review of items were taken from the pilot study group (discussed below).

### **7.7.1 The Translation Process**

The official language in Malaysia, where the survey was administered, is Malay. However, English is considered as a second language and is an essential medium, especially since Malaysia is a multi-ethnic nation comprising three major races each with their own distinct language. Despite the existence of evidence that surveys in Malaysia can be conducted in English (e.g. Chan & Pearson, 2002; Le & Koh, 2002) the questionnaire was nevertheless translated, in case the need for the Malay language should arise.

Using what is called the “back-translation” technique, the first translation from the original version in English to Malay was performed while the researcher was in England preparing for the field study. Thirty Malaysians, mostly university students, were approached to volunteer to help with the project. Translation followed by back-translation is claimed to establish translation equivalence (Douglas & Craig, 1983). Of eleven translations received, only six were complete, useful and received on time. Sentence-by-sentence the six translations were reviewed to find the best translation for each of the questions. This procedure resulted in a single translated version of the questionnaire in Malay. It was later re-translated to English to fulfil the requirement of the back-translation process. Another thirty colleagues in the public sector were approached to participate in this second translation session, which took place in Malaysia. Nine responses were received complete and within the specified time period. The return rates for both sessions were considered satisfactory, considering

the length of the questionnaire and the limited time given. Adjustments and changes were made to the Malay version of the questionnaire taking into account the back-translated version. The final stage in the translation process involved sending the translated version and a copy of the original English questionnaire to a professional translator qualified in English-Malay translation.

### **7.7.2 Validity and Reliability**

Apart from reviewing literature on evidence of reliability and validity among the three components of the questionnaire, the researcher also conducted statistical analysis on the pilot data as well as the actual fieldwork data. Considering the fact that one of the questionnaire components, the TKIM, was constructed with the business context in mind, additional measures were deemed necessary to check its reliability and validity for use in a different cultural setting (Malaysia) and context (Public Sector).

Reliability measures of the constructed questionnaire were obtained through a pilot study described below. The main questionnaire attribute of interest is its internal consistency. Internal consistency refers to the homogeneity of a measure in terms of how the items of an instrument group together into units or factors. This was assessed by calculating Cronbach's alpha (Cronbach, 1951 cited in Li, 2003) reliability coefficients for the three components of the questionnaire.

For the construct validity of the questionnaire, which refers to the extent to which an instrument measures the intended theoretical construct, the researcher relied upon each component's previously reported results. The questionnaire items were

reviewed in order to assess its content validity. The objective of the review, in addition to further refining the instrument was to look for ambiguously worded questions, unclear formatting and appropriateness of questions for use in the Malaysian public sector context. Five senior civil servants with extensive experience in the public sector were personally approached to form the expert review group. Only two responded in time to permit amendments to questionnaire. The first was a retired civil servant with extensive experience working in several different departments throughout the country. The last position held by this reviewer was as a Deputy Director of a federal department. The second expert reviewer was an expert in management development who had more than seventeen years of working experience in developing public sector managers. The second group chosen to review the items was chosen from representatives of the targeted group for this study. This representation was obtained from the same group that was involved in the pilot study. Therefore, questionnaires distributed for the pilot study were attached with several 'comments' pages. Participants were requested in the instructions to review each item in the questionnaire. They then made written comments on the attached pages. Both groups of reviewers were asked to complete the questionnaire and note any ambiguities or other problems in the instrument.

Ambiguous items, most of which were due to the quality of translation of terms, were re-worded for more acceptable phrasing. One main comment given by the reviewers was that Malaysian culture is relatively negative towards completing questionnaires. This issue was raised in relation to the length of the questionnaire which, according to one of the expert reviewers, should not exceed a 'psychological barrier' of ten pages long. Expert reviewers focused their attention mostly on the



contents of the TKIM and the repetitive nature of the LSI. They proposed that several items in the LSI should be dropped, but the researcher decided against doing this in the interest of preserving the well-documented psychometric properties of the LSI scale.

Both expert reviewers proposed that the first scenario of TKIM be dropped. They claimed that it was unrelated to the public sector and they believed that respondents would have problems answering it and more importantly, they would not refer to their experience but would more likely answer it by conjecture. Excluding a scenario from the TKIM raised concern that it might alter the properties of the measure. However, there has been an example in the past of research that excluded a scenario from the inventory (Menkes, 2002). It was proposed, therefore, that the inventory be subjected to factor analytic assessment prior to further analysis. This is reported in Chapter 9.

The expert reviewers also expressed concern that the content of managerial tacit knowledge depicted in the TKIM was insufficient to reflect the immense range of skills and knowledge managers actually used. However, as mentioned earlier, the intention of the present research was not to examine the whole spectrum of managerial tacit knowledge but only to sample aspects of managerial tacit knowledge and to use it to understand the learning associated with its acquisition. The demographic section was also scrutinized in detail. Many suggestions were made to fine-tune the sections on criteria for determining success and sections that distinguished between managers that predominantly perform managerial functions and those that do not. A final suggestion made by the expert reviewers was to

exclude salary from the list, since it was not considered a determinant factor in the public sector.

The TKIM component of the questionnaire was put to another test. It involved having a group of independent referees to identify each scenario as managing self, task or others. The independent referees were first given the definitions of managing others, self and task. These were then compared to the definition of each scenario provided by its authors to observe the degree of similarity. Twelve people, all managers within the Malaysian public sector, responded to e-mail correspondence requesting participation as independent referees. The results are shown in Table 7.4 below:

**Table 7.4: Number of independent referees correctly identifying respective scenarios**

Scenario	Number of correct identifications
1	5
2	8
3	6
4	10
5	5
6	6
7	8
8	7
9	9

Note: The TKIM used here is based on the 9 scenario version.

### 7.7.3 Pre-Testing of Questionnaire

All portions of the survey instrument were administered to a group of 29 INTAN training course participants as the pilot study group. This was done during the second

week of the fieldwork, beginning on 14 July 2003. The purpose of the pre-test was threefold:

- 1) to test 'respondent load' - how long would a respondent be expected to spend in completing each questionnaire?
- 2) to evaluate the appropriateness, formatting and clarity of the questions asked on the survey instrument and
- 3) to perform internal consistency tests

An attachment was added at the end of the questionnaire used for the pilot test. It was intended for two purposes. The first, was to record the time taken by each person to complete the questionnaire. For this purpose, two boxes marked 'Time Start' and 'Time End' were drawn on the attachment. The second purpose was to solicit written comments from the respondents regarding any item that they either did not understand or needed further clarification on. An instruction for this was placed below the boxes.

#### **7.7.4 Major Findings of Pilot Test**

##### *Respondent's Load*

Table 7.5 below shows the time taken for the twenty-nine respondents in the pilot study to complete the survey. Nine completed the task in less than one hour. The shortest reported time was 35 minutes. However, this respondent had made many mistakes and left blank three scenarios (30 questions) from the tacit knowledge inventory for managers, citing them as irrelevant. The other eight that managed to complete the questionnaire within the hour also made a number of mistakes, or did not complete the entire twelve pages of the questionnaire. Two did not complete all forty-eight responses for the Learning Style Inventory, saying that it contained too

many repetitions. Some provided a string of the same response to a large number of questions. Respondents who took between one to two hours showed better accuracy and commitment to the survey. Two out of the four respondents who completed the survey in more than two hours said that they took more than three breaks in the process because the questions needed a lot of ‘thinking’.

**Table 7.5: Reported Time to Complete Survey**

Response Time	<i>n</i>
1 hour or less	9
1 to 2 hours	16
More than 2 hours	4
<b>Total</b>	<b>29</b>

#### *Clarity/Appropriateness*

Of the twenty-nine respondents, eighteen commented on the length of the questionnaire, saying that it is too long to maintain focus. Ten complained of the repetition of questions, specifically in Parts C (learning styles) and D (learning strategies). Another ten said that they were not sure whether some of their current or previous assignments were predominantly managerial or non-managerial (Part A – Demographic). Six comments were received on the irrelevance of Scenario 1 of the TKIM (Part B), suggesting that it was not appropriate for the public sector.

#### *Reliability*

Before any computation could be performed on the questionnaires, an expert (successful) panel had to be identified among the group. Of the 29 participants in the pilot study, four met the requirement as experts against whom the typical sample scores would be compared. The remaining 25 represented the typical respondents.

The following table summarizes the internal consistency reliability assessment using Cronbach's alpha for the questionnaire.

**Table 7.6: Internal consistency reliability estimates for the three inventories**

Scales	<i>N</i> (cases)	$\alpha$ - coefficient
TKIM	22	0.77
– Task	22	0.70
– Self*	-	-
– Others	22	0.83
LSI – CE	24	0.70
– AC	25	0.78
– AE	23	0.76
– RO	25	0.67
LSQ – Mental Strategy	24	0.83
– Behavioural Strategy	24	0.88
– Self-Efficacy Strategy	24	0.74

Note: \* $\alpha$  not computed due to too few cases.

Except only for the RO subscale of the LSI, the high alpha coefficients demonstrate high levels of internal consistency, considering that coefficients above .70 are generally regarded as indicating acceptable levels of internal consistency (Anastasi, 1988).

## 7.8 Development of Final Questionnaires

Taking into account all the comments and suggestions given by the expert and peer reviewers, the questionnaire underwent some changes. These included dropping Scenario 1 from the TKIM, modifying several instructions given in the questionnaire, enhancing the explanation to distinguish between predominantly managerial and

non-managerial positions, selecting representative questions for learning strategy from the LSQ and preparing an electronic version of the questionnaire<sup>1</sup>. The electronic version came after it was noted that a lot of training courses in INTAN were done in a compact mode and ran from the morning till evening. Respondents would then not have enough time to complete the paper-based questionnaire. By using an electronic version of the questionnaire, respondents could still answer the survey, even after they returned to work, and could submit the form by e-mail. Therefore, the questionnaires now appeared not just in two languages, but also in a printed and Microsoft Word Form format, to allow respondents to answer at their own pace. With these changes, the questionnaire now seemed feasible for the fieldwork.

## **7.9 Research Procedures for the Quantitative Phase**

### **7.9.1 Research Sites**

There were seven separate research sites, namely, in the branches of INTAN distributed throughout the country, including two in East Malaysia. However, management development programmes for middle and higher level public sector managers are usually concentrated in the main campus.

### **7.9.2 Population and Samples**

The targeted population from which information or data was sought for this research was public sector managers attending management development programmes at all

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<sup>1</sup> Factor analytic tests were performed later to investigate if modifications have an effect on the psychometric properties the questionnaires' subcomponents.

the seven INTAN branches. The sample frame for the survey was obtained from the list of courses provided in the training booklet. Each unit on the frame was a single training course.

A simple random sampling design was chosen. From the name list of each course, the first respondent's name was taken at random, followed by every alternate name on the name list. This was done regardless of the number of participants in each training course, as the researcher was only interested in sampling the attendees as a whole. The targeted sample size was 400 persons.

There are, however, limitations with the framing choice taken for this research. A number of training courses within the scope of the target population were not covered, because they were too short in duration to give sufficient time for the respondents to complete the questionnaire. Programmes shorter than a week in duration were not selected, for this reason. These included talks, seminars, workshops, and many compact courses, designed to accommodate the majority of managers who cannot leave their work for long periods. The deficiency was overcome by extending the data collection period to the maximum possible within the time frame of this research. The initial planned period of four months of data collection was supposed to end by October 2003 but this was extended to February 2004. Further approval from INTAN'S management was required for this, because the cooperation of the courses' coordinators was needed, since they were requested to handle the administration of the survey for their respective courses. It was also necessary to ensure that they were properly trained to handle the briefing sessions for each course and to answer any questions from the respondents.

### **7.9.3 Level of Analysis**

Tacit knowledge, the main construct for the current research, was drawn from psychology. Within this discipline, tacit knowledge is viewed as attached to the human senses and as such is an individual construct or at least originating from the individual. There are also strong arguments for the view that tacit knowledge can be socially constructed and hence a social attribute. However, the nature of the current research, exploring the association of learning styles with the acquisition of tacit knowledge, called for an analysis at the individual level. Learning style, which was another variable of significant interest in the current research, explains a person's inclination towards a particular style of learning and as such, is a characteristic of an individual. Consistent with the nature of tacit knowledge, this research therefore focused its analysis at the individual level.

### **7.10 Limitations of the Quantitative Phase**

The results of this study might have been affected by several limitations. Firstly, the distance between the university where the researcher was conducting the research and the population studied put a limit on the time for fieldwork. This in turn influenced the selection of population for the study. Ideally, it would have been preferable to sample the entire Malaysian public sector managerial population in each and every department, but with the civil service in excess of 1 million people, the cost and time implications would make this prohibitive. Despite this, the sample selected can still be representative of the larger population of the Malaysian public sector managers because INTAN caters for the entire public service and its policy is



to select participants as widely as possible, to include all states, departments and levels.

The third limitation is in the statistical analyses of data, which were based on measures that have the general limitations of self-report instruments. The three main components of the questionnaire; the TKIM, the normative version of Kolb's original LSI and the LSQ are rather new and as such, evidence of their validity is rather limited. However, most available evidence has demonstrated sufficient reliability and validity (e.g. Geiger et. al., 1993; Kolb et al., 1999; Warr & Downing, 2000) and furthermore the present study will seek to add to this body of evidence.

#### **7.11 Delimitations of the Quantitative Phase**

This study was delimited to a sample of approximately 400 Malaysian public sector managers attending management development programmes at the National Institute of Public Administration (INTAN) between July 7, 2003 and February 29, 2004. Measurement of tacit knowledge was done via the Tacit Knowledge Inventory for Managers (Sternberg et al., 2000), learning styles via the normative version of the Learning Style Inventory (Geiger et. al., 1993) and learning strategies through Warr & Downing's (2000) learning strategy items.

#### **7.12 Fieldwork Procedures of the Quantitative Phase**

Permission was requested to conduct research in INTAN and approval from the management was received before the fieldwork began. INTAN officers at the Project Coordinator and the Senior Project Coordinator levels were responsible for all the

training courses in INTAN. In order to assist the researcher, relevant project coordinators were trained to provide briefings and administer the survey. Briefings, which were done at each classroom where the training courses were conducted, started with a brief introduction to the research and researcher. Other matters covered by the briefing were the guarantee of confidentiality and assurance that the research would be used for academic purposes only. The participants were also informed that their names had been selected at random. Special attention was given to Question 9 of the demographic section, as difficulty with it had been raised during the pilot study. Course participants were advised of the importance of indicating correctly whether the jobs listed were predominantly managerial or non-managerial. They were encouraged to refer to the researcher if in doubt.

The electronic version of the questionnaire proved to be unmanageable. The volume of work in contacting respondents to persuade them to complete and return the forms began to snowball due to poor return rates. Of more than 300 distributed, fewer than 30 were received within two weeks. Discussion with the management of INTAN led to the conclusion that the process was flawed, since it did not offer the researcher control over the data collection. The decision was therefore made to use the printed version of the questionnaire. INTAN was kind enough to charge the researcher only for the cost of paper for photocopies of the questionnaire.

During further briefings following these changes, respondents were asked what language they would prefer to answer the questionnaire in. It emerged that most of them preferred to answer the Malay version of the questionnaire. Therefore, most of the questionnaires, 900 in total, were printed in Malay, and 300 printed in English. A

cover letter was also generated to accompany the printed questionnaire for distribution to the respondents.

### 7.13 Data Collection and Response Rate

The sampling frame comprised 1120 public sector managers attending training courses between July 2003 and February 2004 at the Malaysian National Institute of Public Administration. Both the paper and electronic versions of the questionnaire were returned by 366 subjects. After checking for data entry errors and rectifying mistakes, missing data were analysed. The total number of missing values in the dataset amounted to 301 items (0.57%) out of all possible entries. Of these, 180 (0.34%) missing items were contained in 10 cases. The 10 cases were deemed unusable and were dropped from the dataset. As for the remaining small percentage of missing values (0.23%) left, conventional replacement technique as provided by the statistical software was used.

**Table 7.7: Years of experience for the three sample groups**

Group	N	Range	Mean	Standard Deviation
Novice	113	0.3 – 0.9	0.55	0.1
Typical manager	206	1 – 31.6	9.43	8.5
Expert manager	37	6.2 – 24.6	17.20	5.1

This left 356 usable responses, representing an overall response rate of 31.8%. Of these, 319 (89%) fell into the novice/typical manager group and 37 (11%) fell into the expert group. Of the novice/typical manager group, there were 113 (31.7%) who were classified as novices or trainees, the majority of whom had less than one year of

experience, and 206 (57.9%) who were classified as typical managers, the majority of whom had an average of nine years of experience. Table 7.7 provides descriptive statistics of levels of experience for each of these three groups.

A sample is meant to represent a selected population. However, it is not the sampling design that is representative of the population, but the actual responses received. An issue of debate in sampling literature is whether the responses received are representative of the non-responses. Non-response bias occurs when a substantial number of the sample fail to respond and conclusions made are affected by the missing data (Yu & Cooper, 1983). Many strategies have been employed to counter the problem of non-response, such as improving the questionnaire design, adopting different methods of questionnaire distribution and giving incentives, usually monetary, to respondents (Barsky & Huxley, 1992). The present research strategy was to put a lot of effort into follow-up measures. Every effort was made to ensure that the selected course participants returned their questionnaires before their course ended. After providing a week for them to fill and return the forms, daily reminders were then given in the classroom, besides approaching them on an individual basis. A further four days were given before a replacement candidate was picked up from the next adjacent name on the list. In the event that a training course had ended, contacts were made by telephone or e-mail to reach the prospective respondents.

Next, an analysis of non-response was performed. This test is performed in response to debates on nonresponse error (e.g. Rubin, 1987). It is commonly held that nonresponse error is partially a function of the response rate<sup>2</sup>. Therefore, to check

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<sup>2</sup> However, some have challenged this notion, arguing that their study found little relation between variation in response rates and changes in nonresponse error (e.g. Merkle and Edelman 2002).

whether respondents in the present study were representative of non-respondents, several different courses that had ended were chosen for this test. Non-respondents were identified and defined as those course participants that were sampled but did not return their questionnaire within the desired time frame and had to be replaced by another candidate. With the help of their course coordinators, 60 non-respondents were randomly identified and contacted via e-mails and telephone. They were persuaded to fill their questionnaire or if they had lost it, they were sent an electronic version of the questionnaire. An assortment of reasons was given by non-respondents for not filling the questionnaire, ranging from not having the time during the training course, to it being in their nature never to answer questionnaires. Twenty five people responded after much persuasion. A statistical procedure was conducted to see if there were differences in LAMTK between all the 356 respondents and the 25 persons representing the non-respondents. An independent sample t-test revealed that the mean difference in LAMTK between respondents ( $M = 0.91$ ,  $sd = 0.15$ ,  $n = 356$ ) and non-respondents ( $M = 0.93$ ,  $sd = 0.11$ ,  $n = 22$ ) was not significant ( $t = 0.64$ ,  $p = 0.52$  (2-tailed)). It was concluded, therefore, that data obtained in the present research were representative of the non-respondents as well.

#### **7.14 Data Analysis for the Quantitative Phase of the Study**

Data entry and its coding were planned to be facilitated by use of the electronic version of the questionnaire. This was in anticipation of a huge volume of data from the fieldwork. However, as has been discussed earlier, the poor return rate forced the use of the pen-and-paper version of the questionnaire. This necessitated outsourcing of the data entry process. Training was provided to three data entry personnel and

coding sheets were supplied to them. An error-checking process followed this stage to verify the accuracy of the data entered.

Confirmatory factor analysis was used to analyse the factor structure of the questionnaire components. The results of this test are reported in Chapter 9. Evidence to support the theoretical underpinnings of the questionnaire components in the present research was obtained through this procedure. This was followed by various statistical techniques to test each of the hypotheses outlined earlier. All data analysis was conducted with the Statistical Package for the Social Sciences (version 10; SPSS, Inc., Chicago, IL).

### **7.15 Conclusion**

The overall research design adopted for the present study combined qualitative and quantitative methods in the collection and analysis of data. It is widely recognised that both qualitative and quantitative methods have their own strengths and weaknesses and neither is superior to the other. This 'pragmatist paradigm', according to Waddington (2005), rejects the incommensurate paradigm view and the 'either/or' choice between qualitative and quantitative research methods. The utmost importance was given to the research questions, rather than being constrained by specific disciplinary methodological paradigm.

From the five research questions outlined earlier in the first chapter, the first two were investigated by use of a qualitative method. The ensuing interview data will be analysed in the next chapter. The rest of the research questions were answered quantitatively and the relevant analysis is reported in Chapter 9.

## **CHAPTER 8**

### **QUALITATIVE ANALYSIS AND RESULTS**

#### **8.1 Introduction**

This chapter analyses the data from the interviews with the research participants. It attempts to answer the research question regarding the learning patterns associated with the acquisition of tacit knowledge. It is exploratory in nature and as opposed to the quantitative analysis procedures performed in the next chapter, it is aimed to provide a broader picture in relation to the acquisition of managerial tacit knowledge.

#### **8.2 Analysis Framework**

To approach management development from the learning perspective, it is necessary to delineate the boundary before further discussion. First, as discussed earlier in Chapter 3, the field of management development is replete with literature on learning, predominantly formalized learning. This emphasis was unbalanced and many have argued that more attention should be given towards learning that occurs beyond formalized instructional programmes; the unplanned, non-deliberate learning that takes place on-the-job.

Second, development of managers involves adults and it is therefore necessary to differentiate between the learning of adults and children's school-based learning (Merriam, 2004). Management development should then essentially be linked to

theories of learning involving adults rather than school-based learning. Dwyer (2004) lamented the lack of linkage between the areas of development (including management development) and the principles of adult learning.

Liveright (1968) called adult learners “persons no longer attending school on a regular, full-time basis” (pp.3-4). Jarvis (1987), on the other hand, views adult learning as being tied to its social settings. For Jarvis (1987), adult learning falls into one of three categories: non-learning response, non-reflective response and reflective response. The ability to reflect is, according to Jarvis, the highest order in the hierarchy of adult learning.

Merriam (2001) contended that the literature on adult learning is complex and confusing, being “a mosaic of theories, models, sets of principles, and explanations” (p. 3). However, many researchers view Malcolm Knowles as the pioneer of adult learning, with his concept of andragogy. Knowles (1980; 1990) outlined several characteristics of the adult learner. They are self-directed and autonomous, which means they like to have control over their learning and not have others make the decision for them. Adults also have as a foundation an accumulation of life experiences and knowledge, which they bring into their learning situation and which may influence, either positively or negatively, the way they learn. They are also practical in nature, selecting lessons most useful to them and needing to know the importance of the lessons for them. This characteristic will have an effect on their motivation to learn, as those lessons perceived to be irrelevant would be ignored by



them, whereas those lessons seen as relevant will attract their interest. Adults also tend to be goal oriented and are believed to value earning respect from others.

Merriam (2004) charted the evolution of adult learning theories through three major periods. The early period was marked by efforts to understand adults' learning capabilities, with emphasis given to the study of intelligence, information processing, and memory and cognitive development. This was followed by a period of preoccupation with the notion of andragogy, self-directed learning, and transformational learning. This period marked the delineation of adult learning from school-based learning. More recent trends, according to Merriam, have begun to look at the relationship between spirituality and learning, emotions and learning, and the use of the body as a learning site.

In the light of these theoretical dimensions, the present research will take several leading categories of adult learning, including those that bear relevance to informal, unplanned learning, as the basis from which to analyse the data. Among the selected adult learning principles are self-directed learning (Brockett and Hiemstra, 1991), reflective practice (Schön, 1983), transformational learning (Mezirow, 1994), action learning (Revans, 1982; Weinstein, 1999), and experiential learning (Kolb, 1984). The following sections will briefly introduce each of the learning categories and present several important theories under each category.

### 8.2.1 Self-directed Learning

Self-directed learning (SDL) entails individuals taking responsibility for their own learning. Advocators of SDL argued that it is a primary method for learning in adults (Houle, 1984) and occurs as a “natural part of adult life,” (Merriam and Caffarella, 1999; p.41). It can take place either in the confines of formal educational institutions or out of it; on one’s own or with others’ help (Ellinger, 2004). Several researchers associate SDL with informal and incidental learning (e.g. Cseh et al., 2000; Marsick & Watkins, 2001)

Abbott & Dahmus (1992) defined SDL as "a self-motivated and self-directed process to learn, change, and improve" (p.58). Similarly, Knowles’ (1975) definition of SDL is:

“a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” (p.18).

Candy (1991) argued that the field of SDL is varied, and is used by many authors to refer to various concepts (Brockett, 1994). This inadvertently leads to “a certain conceptual confusion” (Candy, 1991; p.6). In terms of process, Berger (1990) pointed out that SDL follows an unpredictable, non-linear, trial and error process.

Despite its complexity, several researchers have attempted to outline the process used in SDL. One of them is Knowles (1975) who proposed that SDL consists of six

steps: climate setting, determining learning needs, formulating learning goals, getting the resources needed, implementing learning strategies, and evaluating outcomes of learning. Another researcher, Tough (1979) lists thirteen steps in a person's self-planned learning. These include, among others, making a decision on the knowledge and skills to learn, identifying the activities, methods, and resources for learning, setting deadlines or targets, identifying factors that inhibit learning, and enhancing self-motivation for a particular learning episode.

Other theorists within this category, Brockett and Hiemstra (1991), regard self-direction as either an instructional process or a personality characteristic. As a process, it involves the activities of planning, implementing, and evaluating learning.

As a personality characteristic, it is referred to as:

“characteristics of an individual that predispose one toward taking primary responsibility for personal learning endeavors” (Brockett and Hiemstra, 1991, p. 29).

### **8.2.2 Reflective Practice**

The field of reflective practice is rich with contributions from many researchers, and many different theories have been offered. The idea was claimed to be first introduced in 1933 by Dewey who wrote that

“reflective thinking is closely related to critical thinking; it is the turning over of a subject in the mind and giving it serious and consecutive consideration” (p. 3; cited in Ruth-Sahd, 2003).

Another researcher, Habermas (1970) lifted reflective practice beyond the individual level, arguing that it has social and psychological dimensions that may be dialogic.

Researchers and learning theorists in general agreed that reflection refers to the process of examining past and present professional practice critically in order to improve and enhance future practice and knowledge (Hatton & Smith, 1995). Much of the work on reflection attributes the concept to the writings of Donald Schön (1987) who suggested that professional practice is made up of both technical skills and the art of practice. By the latter, he meant that professionals have to solve unique problems, with an uncertain outcome.

Hatton and Smith (1995) defined reflection as a "deliberate thinking about action with a view to its improvement" (p. 40). They divide reflection within specific professional situations into four distinct forms:

- technical examination of current skills and competencies
- analysing performance in a professional role descriptively
- dialogic exploration of alternative ways to solve problems, and
- critical thinking about the effects of one's actions on others with respect to social, political, and cultural forces.

There are several views on the process of reflection. In the view of Cell (1984) and Mezirow (1991), experience happens first and then the learner reflects on it. Others suggested a two-way interaction between reflecting and experiencing. Boud et al. (1985), for example, stated, "...we experience as we reflect, and we reflect as we experience" (p. 18). Schön (1983, 1987) provides a more complex process. He put

forth the idea of learning through experience to help professionals face unique and complex situations in everyday practice. This involves three methods of reflecting: reflection-in-action, reflection-on-action, and reflection-for-action. Reflection-in-action occurs spontaneously in the midst of action. It involves intuitive knowing and the reflection occurs consciously but the learner usually cannot express it explicitly. The learner also reflects in a critical manner, giving rise to the opportunity to experiment with the alternatives available. Reflection-on-action takes place after the event has happened. Also consciously performed, it involves the person returning to re-evaluate and reconsider the options that could have been taken to achieve a better result. Finally, in reflection-for-action, a person decides on the desired outcome from the first two methods and this would guide further action.

Usher (1985, 1989) conceived reflection as comprising two dimensions: surface and deep. Surface reflection occurs in much the same way as in school-based learning where students look at learning as something that needs to be copied. In contrast, deep reflection involves context and is conceptualized as an on-going process. Boud et al. (1985) considered the role of feelings in reflective practice. Emphasizing the importance of having positive feelings in reflecting, the authors conceptualized reflection as a

“...generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations” (p.23).

Mezirow (1990) proposed six levels of reflection:

- Discriminant reflectivity - assessing effectiveness of one's perceptions; identifying reasons for reacting in a certain way and determining interrelationships affecting actions
- Judgmental reflectivity - making judgments about perceptions.
- Conceptual reflectivity - ability to criticise own actions
- Psychic reflectivity - making judgment on other people
- Theoretical reflectivity - making judgments taking into consideration of outside forces
- Affective reflectivity - incorporating feelings in making judgments

### **8.2.3 Transformational Learning**

The third adult learning category to be covered in this chapter, and one which is closely related to reflective practice, is transformational learning. Several theories fall under the category of transformational learning, for example, Freire's emancipatory theory, Mezirow's rational theory and Boyd's Jungian theory. However, the underlying principle behind transformational learning is that the learning undertaken will result in a dramatic and fundamental change in the individual and the way he or she perceives the world (Brown & Posner, 2001). The change could be psychological in terms of reconceptualization of identity, beliefs, values and behaviours, or social, such as in the way a person communicates, thinks systematically and shifts context (Brooks, 2004).

The rationale for the need to transform to such an extent is that all working people today face significant challenges on a scale never before experienced. This requires

the recognition that old ways and habits are no longer effective in answering these new demands. According to Mezirow (1990, 1994) this change in perspective, which develops in all human beings over a long period and results in construction of new meaning structures or frames of reference, comes as a result of a major life incident. Learning through critical reflection will take place when an experience (or incident) conflicts with the person's existing meaning structures (MacDonald et al., 2000).

Mezirow (1994) contends, "Transformative learning is central to what adult education is all about" (p. 226). The change in a person's perspective, which "...provides the context for making meaning" (Mezirow, 1996; p.16) would then contribute to adult development (Gerzon, 1992). Taylor (2000) describes the key concepts underlying transformational learning. Critical incidents or trigger events are experienced by the individual, which constitute the learning experience. Then, as mentioned above, dissonance between long held beliefs or values and the incident will prompt critical reflection resulting in re-examination or re-evaluation. At this stage, feelings overwhelm the person and play a crucial role in eliciting reflection, resulting in affective learning. Relationships and a dialogue process can help to provide support to the learner, which finally brings about change and individual development.

#### 8.2.4 Action Learning

Action learning was the brainchild of Professor Reg Revans and was originally recommended as a management development tool (Smith & O'Neil, 2003). Zuber-Skerritt (2005) provides a definition of action learning as;

“learning from and with each other, from action and concrete experience, as well as taking action as a result of this learning” (p.50).

Revans defined learning attained through engagement in action as the result of learning gained from accepted authorities and learning initiated from the questioning of a person's experience (Smith & O'Neil, 2003). However, emphasis tipped more to learning from accepted authorities than from people's own experience. Action learning, therefore, is designed to redress this imbalance. Throughout the years many variants of action learning have evolved but in general it is a form of learning through experience, “by doing” (ibid; p.63).

Most action learning deals with the post-experience context (McLoughlin, 2004). However, Smith & O'Neil (2003) describe experience as “a very slippery teacher” (p.64) and note that many opportunities for learning from those experiences are missed. Action learning is meant to take full advantage of these experiences by forcing the use of reflection, and insightful inquiries, and by placing the responsibility for implementing solutions on the participants.



It is a process of mutual learning within a small group of people in an organization, called 'Sets' (Miller, 2003). According to Smith & O'Neil (2003), this 'Set' or learning group tackles real organizational problems relevant to the participants' own workplace in real time. They meet at irregular intervals over a fixed programme cycle.

At the meetings, each 'Set' follows a supportive collaborative learning process based on reflection, questioning, conjecture and refutation. Each participant is allowed the opportunity to frame a problem with inputs involving informed questioning from other members. Actions to resolve the problem are then taken by the participant after the meeting. He/she later reflects on the action and then reframes the problem in subsequent meetings (Taylor et al., 2004).

The 'Sets' provide a "safe" (ibid; p.231) environment for participants to engage among themselves. Here the participants formulate new ideas and discover new perspectives (Leitch and Harrison, 1999). This technique acknowledges that any problem brought into a 'Set' by a participant is unique to that person. As such, the participant that brought up the problem is the critical source of information and the ultimate problem solver (Johnson, 1998). The advantages of using action learning are that it helps develop wider problem solving ability (Weinstein, 1999), promotes the development of questioning insight, helps participants to challenge their own assumptions, and brings out feelings of disagreement within the 'Set' (Taylor et al., 2004).

### 8.2.5 Learning from Experience

Although most adult learning theories have experience as their basis, experiential learning theorists give a much more central and prominent position to the role of experience. Experiential learning theorists looked at how to foster learning by observing experience as the starting point and frame of reference. Lindemann (1926), one of the earlier experiential learning theorists, proclaimed, "...the resource of highest value in adult education is the learner's experience" (p.6).

Many researchers have made substantial efforts to understand how adults learn from experience. Several general characteristics of adult learning have been identified. According to McCall et al. (1988), and Smith and Morphey (1994), the trigger for adult learning is the encounter with challenging and difficult tasks. Adults want their experience to be acknowledged as important, valid and influential as a resource for learning (MacDonald et al., 2000). In adults, new information is built on previous knowledge (Caffarella, 1994).

Among those that have developed models to explain how adults reap lessons from experience are Kolb (1984), Cell (1984), Argyris et al. (1985), Juch (1983), and Morris (1994). All of the models revolved around the same theme: experience and reflection. Alan Mumford's work with managers provides some important insight into the nature of adult learning. In one study involving 144 directors in 41 UK-based companies, Mumford (1988) found that the learning came from real work experiences in an unplanned way and it was not fully recognized at the time that it occurred. In another study involving 21 directors in 15 organizations, Mumford

(1996) found four approaches adopted by the participants to learn from experience: the intuitive approach, the incidental approach, the retrospective approach, and the prospective approach. These approaches are briefly described below.

The intuitive approach involved an unconscious process of learning from experience. During interviews, persons with an intuitive approach could detail a variety of different experiences, but never referred to any aspects of learning. Learning came naturally, as far as these learners were concerned and as such there is no need to articulate what and how they learned.

Managers that used the incidental approach, on the other hand, learned after performing a post-mortem on an incident that jolted them. Activities or incidents that provide the spur were usually in the form of mishaps and frustrations, coming out of the ordinary. The person would then mull over what happened in an informal way. Mumford further explained that people using this approach tend to use hindsight to rationalize or justify what happened and would prefer to discuss the matter with someone else in their post-mortem.

In the retrospective approach, the person would look back on something that had happened, which would usually, as in the incidental approach, be mishaps and mistakes. However, people using this approach are more likely to take lessons from it in a more explicit, conscious way. They draw conclusions from the experience after making reviews of the incident. According to Mumford, this approach is more probable in skills-based courses where the person would conduct reviews ending in the acquisition or reinforcement of knowledge, skills and insights.

Finally, the prospective approach, as named by Mumford, entails a person using all of the retrospective elements. However, a marked difference is that besides reviewing what happened, as in the retrospective approach, people using the prospective approach would plan the learning ahead before an experience takes place. Therefore, individuals with this approach would look forward for opportunities to learn. As with the retrospective approach, training courses are believed to provide the most likely setting for this approach.

### 8.3 Analysis of Interviews

The qualitative analysis process is not a stand-alone exercise, as it is tied to the data collection phase (Bogdan and Biklen, 1992). In the case of the present study, this took place during data collection when the researcher made probes during interviews. However, at the present juncture, analysis is performed in a stand-alone mode and is organised into several stages. The first step was to cull tacit instances from the interviews. Instances of tacit knowledge were observed from critical incidents elicited from participants based on an interview protocol obtained from Nestor-Baker (2004; personal communication)<sup>1</sup>. “If-then-because” statements were then constructed from the critical incidents and supplementary questions asked of the participants. Each “if-then-because” statement reflected end states or goals pursued by the participants in dealing with a particular incident. It also contained actions taken to achieve the goals and the reasons explaining the actions. These statements

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<sup>1</sup> Nestor-Baker, N. (NestorBaker@aol.com), 20 February 2004. *Interview protocol with sample probes*. E-mail to Anis Mahmud (A.Mahmud@mgt.hull.ac.uk).

provide a schema for performing the actions, which is claimed to use procedural knowledge that is tacit in nature.

The next step of the analysis is to look at the participants' responses to further probing designed to discover associated learning patterns inherent in the incidents. Some of the probing and additional questions were performed well after the data collection phase had ended. This was usually done through follow-up telephone conversations, as the researcher had already returned to the United Kingdom to resume his Ph.D. studies. Analysis will be presented in this chapter, case by case, followed finally by a summary of an overall picture of learning with respect to the acquisition of managerial tacit knowledge.

The researcher has grouped and analysed together incidents raised in the course of interviewing the 14 participants into samples of managerial tacit knowledge. They are not organised according to the respective participants, because in this phase of the research, differences between the individuals are not the researcher's concern.

#### **8.4 The Critical Incidents**

Literature on tacit knowledge commonly describes it as difficult to articulate and absorb without the individuals realizing it, in other words, hidden from consciousness. Therefore, individuals will not be able to tell how they acquire it directly. Under the present method, participants were not required to identify the knowledge but merely to relate actions they take to handle an incident. These actions

are assumed to be based on tacit knowledge. Probing these actions further will illuminate the learning processes behind the acquisition of such knowledge.

The following extracts represent several incidents raised in the course of the interviews. The first two incidents relate to dealings with subordinates and building trust among employees towards the management.

#### Incident 1:

It's just a normal routine job, selecting participants to attend a course for which I am responsible. I compile the list of all applicants and I shortlist the candidates after consultation with the top management which includes my immediate boss. From here I pass the list on to my staff who will process it including sending out offer letters. Therefore, I asked one of my staff to implement it. Instead, she went to see my superior without my knowledge... going over me, and somehow managed to get the boss to change the list to include names already dropped. I would expect the staff to carry out my orders and if she is not happy, she can always come to see me first to talk it over. Instead, she went to see the boss... I don't know what transpired between them but she most probably must have complained something about me and finally I was ordered to change the decision.

It was given to me as a directive and to avoid complicating the matter further I accepted it from my boss without voicing my displeasure. I told the boss... "If that's the case then I withdraw the original list that I prepared". The thing that bothers me is that even I don't have a say over the selection of candidates... I'm just taking the orders from the top management. I don't know, maybe the old saying "the boss is always right" is still true in this case.

I suppose the overall picture is that if everything goes right, I will do the things the way I think it should be done. So if something goes wrong, then I would have to investigate, analyse and then maybe if needed... change it, get back on track and proceed with other work. Well, the experience may make me more careful, more observant and I may anticipate problems better... I don't know if you can call this intuition, but if I anticipate problems I'll have some alternatives ready.

Well... while it is important to have trust in your staff... on certain sensitive, crucial tasks we cannot take too much risk because ultimately I, the manager, will be responsible and answerable for all work produced by my unit. Although in theory it is important to treat all staff equally and to trust them all equally, in reality there must be one or two staff that we trust more than the rest and we can usually count on this one or two staff. I think many managers will agree with what I'm saying here.

#### Incident 2:

Normally the way I work is quite open, open door policy. It usually depends on the individual but my approach is very open. One of my subordinates comes to see me directly, even bypassing her supervisor, I don't mind. I assume she has her reasons. Her supervisor expressed displeasure at this. He confronted and tried to reprimand her. However, I explained my policy and my reasoning. They can do it to me too, bypass me and see the Director, but after that make sure they return to their immediate superior and explain.

The third incident is one of the most serious issues handled by a participant, again in relation to lower level staff, this time the security guards.

#### Incident 3:

When I first joined the Registrar's Office one of the first things I saw was that the security guards had been making excessive overtime claims. One of them claimed to work for three consecutive days. I called him to see me. Of course he wasn't happy. All the guards were not happy. Furthermore they are not actually under my direct command. My involvement is in making payments to their claims. However, the way claims are made is not proper and it's against rules and regulations. The problem is that their superior always approves their claims.

This incident is controversial and sensitive because it involved the employee's income. I realised that I could not tackle this problem alone. So I discussed this with other managers within the office and together as a management team brought the matter and our proposed solution to the top boss. We acted as a group of management team and I tried not to show too much that I was the one that initiated it. Of course, the security guards also made their representation to the top management. In the end, we managed to agree on the working hours and stay within the rules.

An incident was also recorded involving a participant and his superior. The unit in which the participant works is supposed to provide administrative support to the other units that run training programmes.

**Incident 4:**

Oh... he is a wonderful boss. However, I received input that many people don't like him. The complaints usually come from the programme side. They say they prefer to see me rather than him because he's always not around when they try to meet him. It's not that he is not approachable, but he's not always available. He has many meetings with outsiders and external agencies. He lets us manage our own work. I always brief him on whatever I have done at the end of the day. He likes this because it keeps him informed. In the end, whenever there are problems, he always defends my decisions and me.

In the next two incidents, two participants from the same unit relate their assessment on the relationship between work output and performance appraisal.

**Incident 5:**

I once worked under Sirajuddin. He worked by datelines. Everything went by datelines. Subordinates had a very high stress level (due to this), but in terms of output it was fantastic. Actually, I worked OK under him. The only thing is when he put too much pressure, too much stress (and I delivered) but it was not reflected in the performance report, then I thought it was high time to move (to seek a transfer out of the unit). That means there is too much emphasis put on other things outside of work performance in consideration for reward.

**Incident 6:**

I decided to apply to be transferred out of the unit. Sirajuddin's management style puts too much unnecessary pressure onto the staff and me. He has his own notebook to monitor what work he has given you and when you delivered to him. That is his meter of measurement. In the end, most of the older employees left the unit... In the appraisal form, there is a column for "other tasks performed" and it is one of the last items in the form but for many bosses, it is the most important!

He has the reputation of being the most stringent in giving performance appraisal marks. To him, 70% is already too high. Other bosses are evaluating their employees at around 90%. So when considered for



promotion, we are handicapped. This will ruin me. It will also affect my motivation and morale.

The following incident narrates the experience of a participant who had a colleague promoted to be his immediate boss. He explains the dilemma faced by the unit in adapting to this new environment.

#### Incident 7:

For many years the five of us were colleagues in the same programme. As colleagues there were no barriers between us, we were close friends. One day Dr John was promoted as the programme head. Initially, all of us still tried to work as friends, as one team. Later, problems with senior staff began to come up. The senior staff said that Dr John had changed and tried to keep a distance. Dr John complained that some senior staff were reluctant to take assignments from him and did not treat him accordingly. However, I worked fine with him. I think this has to do with respect. Maybe that's why the PSD (Public Services Department) usually promotes people from outside. The same happens in the private sector. They also take outsiders to fill senior positions.

The anticipation of getting a new superior attracted responses from several participants, who reported varying approaches taken to get to know their new boss.

#### Incident 8:

Every boss brings a reputation with him or her. People can say many things about their experience working under a certain person. But it may not always be true. It can be misleading. Previous reputations can be misleading. I have worked under three different lady bosses before. There's all sort of images said of them... fierce, strict, difficult... But after working with them for a while, I had no complaint, I found it easy dealing with them.

Actually, you need to observe. You get to know your new boss by observing them. You don't need much effort; just observe their style. All bosses need to deliver and in doing so, they have their own style of doing things. For example, all the three woman bosses like details and have a particular writing style. So, I adapt myself to their style. This reduced the amount of reworks.

The next incident was about a participant who was a senior lady manager. She was criticised by her superior for “not knowing how to do her work”. The task involved was the preparation of a Ministerial brief for a proposal to be put up by her department. The incident forced her to compare her experience with all her former bosses, resulting in framing her perception of what subordinates and employees would expect from her as a boss and leader.

#### Incident 9:

Without telling me what he expected from me and how he would like the work to be done, he simply scolded me, saying how could someone like me, despite almost reaching retirement age, still not know how to do my work. First, it was not an ordinary, routine daily kind of task. Secondly, preparing briefs is not even my responsibility; someone else should be doing it.

OK, actually my best memory is my first boss. Of course being new and my first job, he did not assume that I knew much about office work and that helped in him not holding back anything that he thought I needed to learn. He helped me a lot. He called me every morning; asked me what I was doing that day, what I'd done and he always corrected me. At that time I didn't appreciate him because he made me upset. He made me reluctant to come to work because I was thinking I was not good, didn't know how to work. Only later on did I realise that he was a good boss because he helped and taught me to do a lot of things.

The other bosses never taught me anything. I realised that many bosses just assume that their subordinates knew what to do. They are not bothered to help me do my job better. They keep their distance, don't have much rapport with me, don't bother if I am doing well or not, and if anything goes wrong, they get angry and criticize. Subordinates are left out on their own to deal with their problems.

In the next incident, a lady manager analysed the characteristics of some of her previous bosses.

#### Incident 10:

These type of bosses will always want to win and will blame anything wrong on their subordinates without taking the responsibility themselves. I did not argue with him, there's no point. It will only make your life

miserable; you have to play some politics and be clever, don't make things worse.

## **8.5 Culling Tacit Knowledge and Analysing the Associated Learning Patterns**

The above incidents were first rephrased into "if-then-because" statements. Then, since this research is interested in the evidence of learning that contributes to the acquisition of knowledge used in tackling the incidents, this evidence was probed using questions focused towards the "then" portion of the "if-then-because" statements. This is because the "then" portion deals with the action taken by the participants and because as mentioned earlier, it is assumed that this action is based on tacit knowledge. A common probing question asked is "How do they know that (the action taken in "Then") is the right action to take?"

In this section, the incidents identified above are transformed into "if-then-because" statements followed by an analysis of learning instances, performed with respect to the adult learning principles discussed earlier.

**"If-then-because" statement for Incident 1:**

**IF** I need a task done but I anticipate problems from any subordinate

**THEN** I will get it done myself or get another subordinate whom I trust to do it

**BECAUSE** some subordinates might have a personal agenda in doing a particular task and would most probably interfere in the decision I have made. This may undermine my authority, position and control of the unit

Several learning patterns accrued from the “THEN” statement in Incident 1. Schön’s (1987) reflection-on-action is evidenced in the following statement:

This is not the first time it happened to me. This one is the latest episode; I had similar situations before in my career. So it’s not so shocking this time around. I don’t get too upset. It involves normal work, not that I ask her to do something illegal or wrong so I expect her to carry out her duty. Of course, I too would not want to carry out directives that go against procedures, regulations or law.

Here, the participant returned to re-evaluate the past experience. It also involved the participant performing a post-mortem on the incident that jolted him, therefore fitting the incidental approach to learning from experience as proposed by Mumford (1996).

Another statement by the same participant also highlights the incidental approach:

What causes this to happen is maybe some people have been too long in INTAN and they feel they are indispensable or too important such that they lose the sense of respect for their immediate superior, especially if the superior joined the organization after them. Perhaps too it is just the person’s character because not all staff do it... just one or two only. As to whether the incident can be avoided in the first place... I would say no because it is not my decision, I was just taking orders... had it been my decision then maybe I could take her opinion in before selecting the applicants. If I myself don’t have a say, automatically it goes down the line, doesn’t it?

Two of Hatton and Smith’s (1995) four distinct forms of reflection are evidenced in the following statements. The first form of reflection - effect of one’s action on others - can be seen here, where the action taken by one person has upset the system:

This is my personal experience; it’s what I’ll call the “culture” of INTAN - for the lower staff to go over the PTK to see the boss and somewhat being entertained. Definitely, this is not a healthy culture - as far as I am concerned. It upsets the system, and has a bad influence on other staff. I myself never bypass my immediate superior. I also never complain about

my superior to a higher authority. I expect my subordinate to follow the hierarchy, show respect... of course I don't like what happened.

Another form of reflection is demonstrated when the participant gave a descriptive analysis of his performance in a professional role:

It is an important experience to me not because insubordination is something new to me but it tells me not to assume... in the future, I need to gauge the situation better.

By saying that he/she needs to gauge the situation better in the future, the participant acknowledges that he/she lacked the skills needed to handle the incident.

Schön's (1987) reflection-for-action, where the participant used the present incident for future action is evidenced in the following statements:

In the future if I have a similar task I will have it done by another person rather than going to this particular person. Another thing I can also do is that no matter how small the issue is, I will discuss it with the boss first. Still it would not change the fact that once I pass the work to the staff, she will come up with another idea, see the boss and have it changed.

This kind of thing, they happen. I know I need to accept this, to learn to accept this... to force myself to accept this. This episode tells me to expect anything to happen in the future... so that it doesn't come to me as a shock and that if it is a norm within that organization, to accept it.

The above statements showed that reflection-for-action played a part in the participant's decision to perform a task himself or ask someone he trusts to do it in certain situations. Usher's (1989) deep reflection is manifested in statements that

display an on-going learning process with contextual elements playing a significant part:

I don't think I can generalize this incident for the future so much so that it is always at the back of my mind whenever I want to give a task to my staff. It involved personality... any other person will most likely obey my instruction right away. If something like this happens again, of course this incident will come back to mind.

Could I have anticipated this earlier... well, maybe I could... she has previous cases when she disobeyed me but those are little things that I can tolerate.

I can use (whatever is said in) a book or whatever recommended by consultants to guide but the external environment where it happened is very important and the position the boss took is very important. If the boss doesn't support me, then anything that I do, whatever arguments I put up, would not hold water. Ideally, I would call the subordinate in, have a discussion with that person or as some people would say, try to buy in and probably get her participation... her opinion. However, in the present context, this would not work. Because one, the personality, two, the person have been long in that place and is so used to doing things her own way and finally, the support of the environment (boss).

**"If-then-because" statement for Incident 2:**

**IF** I want to develop trust in my subordinates

**THEN** I try not to be too rigid with them such as not to be too concerned with hierarchy

**BECAUSE** the respect most bosses want from their employees should not come from status and position but from the trust we place in them.

The participant came out with the following statements upon further probing on the

**"THEN" statement;**

I worked in many different departments before. It is a culture in our public service that hierarchy must be respected. Bosses always wanted to have tight control over their subordinates. But subordinates usually hate to see their boss. If they eagerly want to see you, there must be something urgent

or very important. Then there is no need for protocol. Most important is we develop trust and by this we inculcate a trustworthy culture.

I noticed that my subordinates seemed to keep their problems, especially personal ones, to themselves... They try to manage it on their own. They only see me if it is very sensitive and important, otherwise they will bring up matters, work related usually, during meetings.

No direct link to any learning patterns can be established from the above statements.

In addition, further probing also failed to elucidate any learning patterns from the participant. However, it is obvious that he had the knowledge to treat his employees in that manner. The knowledge was most probably obtained in an unconscious manner through what is termed by Mumford (1997) as an “osmosis” (p.232) process.

The learning involved is categorized as the intuitive approach.

“If-then-because” statement for Incident 3:

**IF** I want to raise a sensitive issue involving lower employees,

**THEN** I get the whole management team involved,

**BECAUSE** this reduces the possibility that employees see it as my personal agenda.

Probing made on the “THEN” statement resulted in the following response:

The mandor (supervisor) system is obviously not working. Once it is not working, the respect of employees is also lost.

Some people, despite being managers, are weak in carrying out their responsibilities. They would rather follow whatever their subordinates like, just to be popular. Actually, this type of manager lacks confidence to supervise large groups of people. We as managers need to support them. In this case, once other colleagues approached the manager, discussed the problem, its consequences, and provided solutions to solve it, he became quite responsive, despite being negative earlier. A manager can be a lonely job... we too need to work as a group.

In narrating the incident, the participant said, “I realised that I could not tackle this problem alone”. This points to Schön’s (1987) reflection-in-action. The participant reflected in the midst of the incident. Another description of the learning involved in taking the action above is probably the incidental approach. The participant actually looked back at his actions and the learning that occurred was more “by chance” (Mumford, 1997; p.232).

“If-then-because” statement for Incident 4:

**IF** I want to get the backing of my boss,  
**THEN** I must always inform him of decisions/actions I take,  
**BECAUSE** this will make him feel that I am a loyal person and respect him as my superior.

Responses accrued from probing the “THEN” statement:

I listen to people who I am supposed to serve (the customers). It was they who told me about my boss. Although it is not always correct, at least it tells how they feel. Then it is our job to correct things.

It always pays to be on your boss’s side. In fact, even when he makes mistakes, we as subordinates don’t nail him. This shows loyalty and loyalty pays at the end of the day. It is very, very important to show to the boss that we are not hiding anything from him. That is why we must always tell the boss all our actions. Even when nothing much occurs that day, we still go to see him at the end of the day, inform him what happened and what we did that day before going home. Most bosses like subordinates who constantly stay in touch with them.

The participant found difficulty describing how he learned that the action he took worked with his boss. Saying that it had always worked with his previous and present bosses, he displayed an intuitive learning from his own experience.

“If-then-because” statements for Incident 5:



**IF** I want to be considered as excellent,

**THEN** I must actively participate in departmental activities beyond work alone,

**BECAUSE** this makes me part of the team and many superiors like to assess their subordinates on grounds beyond work performance.

Responses accrued from probing the “THEN” statement:

Actually, performance reward is not solely based on work performance, (although) everybody says it (is) based on work performance, of course! Work performance is just part of it. Are you willing to take additional workload? Are you willing to contribute, get involved in activities? In departmental life, we don't just have work. There are also other activities, family days, quality days, parties, celebrations... we have to participate. Without employees' participation the organization can't get moving.

If you just do work alone, (by) itself, it doesn't help. You work very hard; it doesn't mean you are excellent, does it? Take Dr Zahratul and Dr Malik. They made hundreds of speeches for the Director. It took hours and hours just to prepare that, a lot (of) time taken. That makes the difference. In running courses, everybody runs them; so on top of running courses, what makes them different? That (writing speeches) makes them different.

I recommended a young, quite new typist for the Service Excellence Award (despite knowing that employees must serve at least 3 years before they can be nominated). The senior typists, some with more than 20 years experience, were furious about it. But then, there is not much difference in a typist's job. The young typist showed much enthusiasm, accepted whatever work I gave her and was eager to learn. However, the senior typists are full of excuses. They lack drive and don't have much motivation either in work or anything else. Even though senior staff are more knowledgeable, sometimes that knowledge is counter-productive to the organization. They may do their work but take shortcuts and tend to be protective of their non-working hours.

About private and work life, it depends on the individual. Some people take both as the same, others totally separate both. Do I mix private affairs and office life? No, I never mix them. I'm looking at that partly... because of the Western culture. When I was attached to a British company in the UK, I observed, which is something I picked up from them... What is my time... my time, what is office time... office time. (However), if there is a need for additional office work, we do it! No problem. But in my private time, I will decide on my own. Actually two persons influence me, one is Sirajuddin the other is Haji Affendi. You know Haji Affendi. I realize what he says is true. Otherwise, you will be mixing up your personal problem and office...

In narrating the incident, the participant showed displeasure at the evaluation process that placed much emphasis on activities beyond work performance. However, his responses to probing questions indicated that he had begun to accept the fact that performance evaluation may go well beyond work aspects. This clearly indicates two forms of reflection: reflection-on-action and reflection-for-action. Also evident is transformational learning, as the incident has, to a certain degree, changed the participant's perspective on performance evaluation. Another learning pattern that emerged from this participant is the retrospective approach of learning from experience. The participant makes a conscious effort to compare the work of others in his department and comes to the conclusion that performance reward is not solely based on work performance.

**"If-then-because" statements for Incident 6:**

**IF** I want to safeguard my professional career

**THEN** I must leave the unit/department when the superior is not in a good relationship with me

**BECAUSE** it is not worth staying there as I would not be able to change the situation and it will have a negative effect on me personally, psychologically and professionally.

**Responses accrued from probing the "THEN" statement:**

His style of management is not suitable for a training institute like INTAN. As a training institution, INTAN must produce a conducive, friendly and non-stressful working environment. It's not that I cannot stand working there anymore, sometimes when I look at it, it is just not worth it. Our annual appraisal is suffering from low marks whereas all other people in other units and departments are getting much higher marks, despite not working as hard as we do under him. The marks are so important for our promotion and to apply for training courses. Before it had further effect on my career I'd better leave.

The participant displayed a high level of emotion in narrating his experience over this incident. Evident throughout his response to probing made are learning patterns associated with feelings in reflective practice (Boud et al., 1985).

“If-then-because” statement for Incident 7:

**IF** I want to have a good working relationship with a new boss who recently was a colleague

**THEN** I must create a boundary between him and me

**BECAUSE** this will create the right subordinate/superior environment

Responses accrued from probing the “THEN” statement:

I think because we were colleagues, when he became boss, the nature of relationship, the level of respect ... has to change. Some of the colleagues find it hard to change and the new boss find that he needs to change into his new role. It's about boundary, there needs to be a boundary that differentiates our relationship.

Initially, when I first worked in the public service, I stayed away from my boss. In fact, even now I still keep a boundary with my immediate superior. You must create a boundary. With this, I show respect for his/her position. However, the gap is different now from the first time I worked. In those days, I would only see my boss when called. But now it's different; it's easier to go see the boss when there is anything I need to bring up to him/her. Besides being more mature, the environment contributes to this change. For example, the Ministry's environment is not the same as INTAN's environment. The environment in a Ministry is more formal than in INTAN. The outcome is in INTAN we have a more relaxed environment.

It is important to have the gap between the boss and I reduced to get things moving faster. In addition, with reduced gap we get to anticipate the boss better to analyse his thinking... his feeling. I have to develop this on my own, again from my observation... experiencing it. We have to pick it up individually. You cannot teach this to another person.

The participant displayed a combination of both intuitive and incidental learning approaches in learning from experience. The learning is mostly unconscious and the

reflection occurred only as a response from the researcher's probing. This leans towards an intuitive learning approach. In terms of incidental learning, the participant does display a post-mortem kind of analysis on the incident. However, it does not fully meet the incidental learning criteria, as the incident does not really come as a surprise to him.

**"If-then-because" statements for Incident 8:**

**IF** I want to know about my boss

**THEN** I need to observe them myself

**BECAUSE** relying on another person's account can be misleading

**IF** I want to reduce the need for rework on any task

**THEN** I must match my style to my boss's style

**BECAUSE** the final product produced from a unit always has the distinctive feature of the highest person in the unit...the boss.

**Responses accrued from probing the "THEN" statements:**

Observation works but it is not easy. It's more than the eye...looking. When you meet a new boss and you have face-to-face discussions, interact, then you can see. Sometimes, you need to feel it. It involves feeling and judging the situation.

For example, the Director some time ago gave me a task to do. A day later he asked, rather casually, how was the progress. By the third time he asked, he took the task back and gave it to someone else. Then I knew, even when he doesn't sound urgent I'd better be sure how fast he wants it done.

Also with the Director, the first time he asked me to draft a letter; I was wondering how he liked it done. I drafted something and showed it to him. His first response was "This is not the way to write a letter". He pointed out what to change. I did it and sent a second draft to him. He made some more changes. After the third draft, only he signed it. Nowadays he hardly reads my drafts... he just signs them. Therefore, we developed trust and matched in style. Again and again, I always noticed that whenever bosses asked me to redo certain things, it is not so much because there is anything wrong

with it but because he doesn't like it. It's merely style... not quality or mistakes.

Getting to know the boss... it never occurred to me it as being learning involved. Only after talking it out today did I realise the learning involved. It doesn't take place consciously though. As I get more experienced I find that I get to know a new boss faster... getting things delivered the way he wants it faster. Of course, it depends on the frequency of the interaction too.

The response from the participant indicates a clear reference to the use of Boud et al's (1985) feelings in reflection. The participant showed heavy reliance on her feelings to learn from experience. In term of Schön's (1987) terminology, the response displays reflection-on-action where the participant thinks back on the experience she went through in doing the tasks given by her superior. Finally, after probing upon probing, the participant realised that the intention of the researcher was to elucidate learning patterns in her. This made her declare that she had never seen the experience in terms of learning. This displayed an intuitive approach to learning from experience.

**"If-then-because" statement for Incident 9:**

**IF** I want to earn the respect of my subordinates as their superior and leader  
**THEN** I must show complete control and sufficient knowledge of the tasks that I want my subordinates to perform  
**BECAUSE** subordinates, whether they are new or old would always look at the superior for guidance and direction

**Responses accrued from probing the "THEN" statement:**

While working here I found that some bosses don't have that much knowledge to teach me or to guide me. I have to do a lot of things on my own ... the bosses just go away after asking me to do the work ... I then report on what I have done, that's all.

So when the bosses is not able to help you... guide you, then you have to find ways and means to solve it yourself, ways and means of how to look for people who can help you, who have the experience to solve that problem. It is a difficult process because we are told to look to our bosses for help. So when the bosses are not forthcoming, of course we are disappointed.

The above statements displayed one of Hatton and Smith's (1995) forms of reflection; dialogic exploration of alternative ways to solve problems. The participant evaluates the options to take in light of the unfavourable situation facing her. The next two statements, on the other hand, show the participant drawing lessons from the incident that will influence the action she described in the if-then-because statement above.

We have to be careful because we do not know if the boss likes it or not, when we go on our own to seek help from others to solve our problems. But from what I learned, actually most bosses, when they cannot teach you, then they are happy that you are able to work on your own. And a boss that understand the situation, accepts the fact that he can't help you much, will mostly regard you as an independent and reliable worker and will usually reward you for it.

I must always guide and lead my subordinates, ask if they understand the task, provide advice and assistance, no matter if they are young or old. Employees look to the boss for example, as a guide, teacher, or mentor. What I will advise my subordinates is that throughout their career they should expect to meet many different bosses with many different styles and be prepared for it. Some, like my first boss, are very open and helpful. Some will leave you to float or drown on your own. Among those that leave you to float or drown on your own, there are those that will appreciate your initiative and reward you but in the extreme of cases there will be those that will wash their hands and put the blame for any mistakes on you.

"If-then-because" statement for Incident 10:

**IF** I want to keep a pleasant working atmosphere

**THEN** I must always hide negative feelings about my boss

**BECAUSE** most bosses want to be recognised as being a leader, clever and in control

Responses accrued from probing the “THEN” statement:

Whether you like it or you don't like it... you cannot show any emotion that you don't like your boss. You must always give your boss the feelings that you are supporting him that you think that he's the best boss and he is very clever even though he is not very clever. You must show you need him, always try to get his advice because that's what bosses like.

If you don't do this they may get angry and they can get very personal unfortunately. We have to be able to read the boss. Some of them don't like to be criticised, some don't like you to show you are smarter than them. They may feel threatened, then they may take it personally, and they may marginalize or ignore you.

You read about this in books but it's not the same as experiencing them. Because of the feelings involved when you go through the process... having a boss like that and you feel the anger and you feel the frustration, dissatisfaction. Then you begin to handle the situation, control your feelings...

It is important that he (the boss) be nice to you. Because when he is nice to you, you will be happy. And you go home to your family, you will be happy. But if the boss is not nice to you, he treats you very badly, you go home... and you “kick things around”, you take the bad mood into your family.

Of course this is applicable anywhere else. I have worked in six different government agencies and this thing happened in all the places I worked. I picked this up from experience. However, this does not mean a young, junior manager could not have picked this up because this thing does not just happen in work; it also takes place in normal daily life. Except that, different people pick up different things... that's all.

In the above statements, the participant prominently displayed the use of feelings in reflective practice. She relied heavily on her feelings in dealing with her superiors.

This was coupled with learning from experience through the intuitive approach as

evidenced by the participant's focus on handling the situation rather than learning from the incident. The learning took place unconsciously and occurred by chance.

## 8.6 Conclusion

One main theme emerges from the analysis of the learning instances undertaken in this chapter. It appeared that the participants were more concerned with tackling the work-related problems at hand rather than having any concern about learning. What is obvious is that learning did not take place as an explicit intention of the participants. This finding supports statements by Mumford (1995) that the concern for work will usually take priority over learning and by Morris (1994) that "work seems to drive out the awareness of learning" (p.127).

In addition, the findings of this chapter also show evidence for three of the adult learning principles: reflective practice, learning from experience and transformational learning. Furthermore, some forms of adult learning appear more frequently than others. In terms of Hatton and Smith's (1995) four distinct forms of reflection, the findings showed evidence for three of the forms: descriptive analysis of one's performance in a professional role, dialogic exploration of alternative ways to solve problems, and critical thinking about the effects of one's actions on others. The other reflective practices that appeared in the analyses are Usher's (1989) deep reflection, Boud et al's (1985) feelings in reflective practice, and all three forms of Schön's (1987) reflection (reflection-in-action, reflection-on-action, and reflection-for-action). Three of Mumford's (1996) four approaches to learning from experience also emerged in the findings. They are the intuitive approach, the incidental



approach, and the retrospective approach. However, the other forms of adult learning presented earlier were not evidenced from the analyses and this will be discussed next.

The research did not find evidence for self-directed learning, action learning, one of Hatton and Smith's (1995) four forms of reflection (the technical examination of a person's immediate skills and competencies), and the prospective approach in Mumford's (1996) four approaches to learning from experience. No strong evidence of self-directed learning was found from the existence of a process and personal characteristics as defined by Brockett and Hiemstra (1991). In terms of personal characteristics, there was no evidence from the interviews of participants taking personal responsibility for their learning. However, there is indirect evidence of personal responsibility to learn, as shown by one of the statements made by a participant. This is from Incident 1 where the participant stated: "...it tells me not to assume... in the future, I need to gauge the situation better". By saying that in the future he could not assume that subordinates would always obey him and he would need to gauge the situation better, he may have been implying that he realized the need to learn from his experiences in order to be a better manager. However, the evidence is not so strong as to suggest that the participant purposely intended to take personal responsibility for learning from his experience in other situations, as well, in the future. The idea of self-directed learning is that people will take personal responsibility to learn from future events. There is, however, no evidence in the present case to suggest that the participant would take responsibility for his learning from future incidents.

On the other hand, in terms of process, there was also no evidence that the participants proactively planned and anticipated their learning in any of the learning instances. The only anticipation demonstrated was in relation to Incident 1, when the participant stated that he should expect anything (similar) to happen in the future; however, he did not mention any explicit intention to learn from it. This finding supports earlier findings by Spear and Mocker (1984) who found no evidence of pre-planning in self-directed learning experiences. Furthermore, there is no evidence of self-directed learning in the sense that the participants did not see themselves as being learners in the first instance. Any mention of learning only occurred as a result of prompt questions directed at them.

There was also no sign of one of Hatton and Smith's (1995) four forms of reflection. That particular form of reflection, the technical examination of a person's immediate skills and competencies, was not evidenced in any of the statements made by the participants. One of Mumford's (1996) four approaches to learning from experience, the prospective approach, was also not manifested in any of the interviews. Finally, the analysis performed showed no evidence of action learning, that is, learning that took place from and with others. These findings have some implications for our understanding of learning associated with the accumulation of managerial tacit knowledge and this will be discussed in more detail below.

A notable pattern emerged out of the analysis in that the adult learning principles associated with the accumulation of managerial tacit knowledge can be generalized in terms of the participant's intention to learn. Moreover, many researchers have

framed adult learning within the scope of adult education and defined it in terms of learning intent. Verner (1964) for instance, sees adult education as a "...part of a systematic, planned, instructional program for adults" (p. 2) and to Liveright (1968) adult education are "activities with the conscious intention of bringing about changes in information, knowledge, understanding, skills, appreciation, and attitudes; or to identify and solve personal or community problems" (pp.3-4). These definitions view adult learning as a conscious and deliberate process. This view resulted in the proposal of various processes thought to explain adult learning (e.g. Cell, 1984; Kolb, 1984). However, there are others such as Tennant and Pogson (1995) who argued, "...a significant portion of adult learning takes place at an implicit level" (p.57). In addition, Mumford (1994) also suggests that adults learn in an accidental and incidental way. They may use the learning process unconsciously. This is evidenced when the learner is unaware of the learning that took place. Literature evidence discussed earlier in Chapter 3 has shown that this view dominates current thinking in management development.

From the analysis performed, it is clear that the learning patterns displayed by the participants can be categorized in terms of learning intent. In the case of Mumford's (1996) four approaches to learning from experience, the retrospective and the prospective approaches involve a more explicit, conscious way of learning compared to the intuitive and incidental approaches. Transformational learning, by which learning is triggered by critical incidents, may or may not take place deliberately. However, reflective practice would mostly happen only through a deliberate and conscious attempt. The same can be said of self-directed learning, which involves a conscious effort to learn within a small group of people in an organization and action

learning which involves 'learning by doing'; dealing with the post-experience context in a deliberate manner

The results of the analyses provide an answer to the first research question developed in Chapter 1, concerning learning patterns associated with the accumulation of managerial tacit knowledge. They indicate that most of the learning patterns that emerged are those that are not within the conscious and deliberate category. Much of the participants' learning was associated with Mumford's intuitive and incidental approach. Reflection also had a dominant influence throughout the learning instances drawn out from the participants. Although reflective practice including Hatton and Smith's (1995) forms of reflection is conscious and deliberate, learning, however, did not appear to be the explicit intention of the participants. Reflection was done here more for purposes of finding a solution to the problem in the current context. In the final analysis, it can be concluded that the accumulation of managerial tacit knowledge took place in a learning context that was less deliberate, unplanned, with a low degree of consciousness, and appeared to take place while tackling work-related issues and problems.

The findings in this chapter are consonant with secondary findings made earlier in Chapters 3 and 4. In those chapters, it was concluded that formal learning alone is insufficient for the development of managers and therefore, there should be greater recognition of the contribution of informal learning as a significant and valid component in the overall learning process. This argument is based on recent research which suggests managers learn more effectively in informal, on the job settings,

rather than from formal education and development programmes. In those chapters, it was argued that learning from informal means, especially learning from personal experiences on-the-job would lead to the creation of tacit knowledge. This argument is supported by the findings from this chapter. In addition, the present findings also provide a preamble to the next chapter, which looks in more detail at learning that takes place in informal on-the-job settings, by focusing on several relationships that can explain the variations in the levels of accumulated managerial tacit knowledge.

## **CHAPTER 9**

### **QUANTITATIVE DATA ANALYSIS AND RESULTS**

#### **9.1 Introduction**

Having considered the qualitative element of the study in the previous chapter, this chapter is concerned with presenting analyses of quantitative data obtained from the questionnaire survey. It is divided into three parts. First, the psychometric properties of the three major components of the questionnaire are reviewed. This is followed by testing of all the entire hypotheses listed in Chapter 5. Finally, further analysis is performed to answer any questions arising from the hypothesis testing.

#### **9.2 Psychometric Properties of the Research Instruments**

There are three major components of the questionnaire used in the present research; tacit knowledge, which is based on Sternberg et al's (2000) Tacit Knowledge Inventory for Managers, Geiger et al's (1993) normative version of Kolb's Learning Style Inventory and learning strategy, based on Warr & Downing's (2000) Learning Strategies Questionnaire. A major statistical tool to be used in this section is confirmatory factor analysis.

##### **9.2.1 Factor Analysis**

There are generally two types of factor analysis: Exploratory Factor Analysis and Confirmatory Factor Analysis. The principle behind exploratory factor analysis is to find factors that underlie the variables in question. This is done by looking for patterns in the interrelationships between variables observed in their correlation or

covariance matrices. The observed variables are then grouped together according to their correlated patterns into what are called factors. Exploratory factor analysis is mostly performed either to reduce the number of variables or to detect the structure of variables. It suits a situation where a newly constructed questionnaire is being developed. Confirmatory Factor Analysis (Jöreskog and Sörbom, 1993), on the other hand, serves to confirm that the data collected corresponds to an existing espoused theory (Fox, 1997a).

An important purpose of factor analysis is to investigate the existence of multicollinearity (Ibrahim & Wee, 2002) which may threaten interpretations made from correlational studies. Multicollinearity occurs when independent variables in a study or subscales in a measure are too highly correlated among themselves (Hanke & Reitsch, 1994). Generally, correlations of more than 0.8 are considered as the threshold for multicollinearity (Nunnally, 1978) and are observed from the zero-order correlations among variables.

The appropriateness of a dataset for factor analysis can be inspected using two tests: the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test (Kline, 1994). The Bartlett's test of sphericity measures the probability of getting an identity matrix from the correlation matrix. A probability of less than 0.5 is considered a significant sphericity for the test. On the other hand, Kaiser-Meyer-Olkin tests for sampling adequacy. De Vaus (1996) and Field (2000) put a KMO value of above 0.5 as a sufficient criterion to proceed with factor analysis, while Garson (2001b) puts the cut-off slightly higher, at 0.6.

Factor analysis involves placing all variables in a correlation matrix. From the correlation matrix, the amount of variance in the variables accounted for by the factors can be observed from the communality values. The extracted communality of a variable is the percent of variance in a variable explained by the extracted factors. According to Field (2000), extracted factors should explain around fifty per cent or more of any given variable for a satisfactory result. Miles & Huberman (1994), on the other hand, recommended a minimum communality value of 0.4 as generally needed to consider a factor good.

One main method of factor extraction is the latent root criterion, also popularly known by the name of its founder, Kaiser, where factors with eigenvalues greater than one are selected. Another method is to use the scree test proposed by Cattell in 1966, which provides a graph with the eigenvalues of all the factors. The convention is to take the factors up to where the graph starts to flatten. Loadings of variables onto a factor are another important element in the extraction of variables. Higher loadings mean that the variable contributed more towards a factor (Bollen, 1989) and loadings of more than 0.3 are generally accepted as significant (Hair et al., 1998).

Two of the most popular extraction techniques are the Maximum Likelihood (ML) extraction and the Principal Factors (PF) method. According to Fabrigar et al. (1999), ML provides the advantage of providing various measures of goodness-of-fit and the ability to test loadings and correlations of significance between factors whereas PF, on the other hand, has the advantage of having no distributional assumptions. They strongly argue for the use of ML for its flexibility, using it to the normality distribution limit of +/-2 for skewness and 7 for kurtosis. Even at above these levels,



they suggested correctional measures first by transforming the variables, before opting for PF methods. Comrey and Lee (1992) also support the ML method because it eliminates:

“(the) indeterminacies and subjective decisions required by other extraction methods... (and) contained a powerful invariance property” (p.109).

However, in situations where the number of factors was specified a priori, PF methods are usually recommended (Preacher & MacCallum, 2003).

Rotation is performed to avoid variables with high loadings falling into too many different factors in order to facilitate interpretation. Two common types of rotation are oblique and orthogonal rotations. Several authors strongly support oblique rotation over other methods for its assumption of interfactor relationship (Tabachnick & Fidell, 2000) and its ability to produce a better estimate of factors among correlated latent variables (Fabrigar et.al., 1999). Varimax rotation, in contrast, aims to maximise the variations in the variables and is much easier to interpret. Other authors look for simplicity, as with the Promax rotation, which is claimed by Comrey and Lee (1992) to use less computer resources, despite giving results comparable to other rotation methods.

A popular form of confirmatory factory analysis is Structural Equation Modelling (SEM). In SEM, models comprising factor structures are tested against observed (collected) data to see the best fit. It is performed a priori, with the numbers of factors to be extracted already specified with an expected pattern of relationship. This relationship was defined theoretically and its relationship examined in SEM

using matrix equations (Hayduk, 1989). Chin (1998) called SEM a second-generation statistical technique that has an advantage over first-generation methods in the flexibility of interplay between theory and data. Two common computer programmes for SEM are LISREL (Jöreskog and Sörbom, 1993) and AMOS (Analysis of Moments Structure) (Arbuckle, 1997). AMOS provides the advantage of a better user interface and ease of use whereas LISREL, the first SEM programme, has more advanced features. Both LISREL and AMOS evaluate the goodness-of-fit between the specified model and data using maximum likelihood estimates and several fit indexes (Loo, 1999).

The overall fit between models and observed data, also known as the absolute fit, is determined by the chi square value. The probability value derived from the chi square, together with the degree of freedom, will determine if the null hypothesis that the model fits the data is accepted or rejected. A probability value below 0.05 is usually taken by convention to reject the null hypothesis. However, the use of chi-square to test models' goodness-of-fit has been criticised by many scholars as being inflated with an increase in sample size (e.g. Garson, 2001c; Loo, 1999). For this reason, Christine Fox (1997a) proposed that a look at other fit statistics, commonly termed relative fit statistics, is necessary. Researchers usually use a combination of three to four relative fit measurements to evaluate the consistency of each model. AMOS provides more than 20 goodness-of-fit measures but there has been no agreement as to which combination is to be taken. There are generally four fit categories, which include measures of parsimony, measurement based on population discrepancy, minimum sample discrepancy and measures that compare to a baseline

model. It is common, however, to find researchers taking one measure each from the different categories of fit measures.

Among the more popular fit measurements used by researchers are the CMIN to degree of freedom ratio (CMIN/df), the incremental fit index (IFI), goodness-of-fit (GFI), the adjusted goodness-of-fit (AGFI), the non-normed fit index (NNFI), and the root mean square error of approximation (RMSEA). The CMIN/df fit statistic is one of the most common fit measures and is also known as the relative chi square. CMIN is the minimum value of discrepancy and df is the degree of freedom. As mentioned earlier, the chi square value is affected by sample size. Therefore, relative chi square counters this effect by looking at the chi square in relation to the degree of freedom. This fit statistic falls into the minimum sample discrepancy measurement category. On the other hand, RMSEA measures the average unexplained variances and covariances in a model. The Goodness-of-Fit Index (GFI) and Comparative Fit Index (CFI) make comparisons of the model. The GFI compares the fit between the hypothesized model and not having a model at all, while the CFI compares the fit between the hypothesized model and a baseline model which is usually the independence model. The AGFI is similar to the GFI but takes into consideration the degree of freedom. With the GFI, AGFI and CFI, a value of 1 indicates a perfect fit for a model.

There has been no agreement as to the cut-off point for each of the fit measures. Fox (1997a), for instance, proposed that an adequate fit is achieved with a score of above 0.9 for measures of NNFI, IFI, GFI and AGFI while values close to zero are required for RMSEA. Heck & Wolcott (1997) also put values at above 0.9 as providing a

good fit for GFI, AGFI and CFI. There are, however, researchers that consider values of above 0.8 for GFI, AGFI and CFI as acceptable (e.g. Doll & Xia 1994). Browne & Cudeck (1993) discussed the cut-off for RMSEA at length. They proposed a 0.05 cut-off value, although levels at 0.08 are still reasonable. However, they argued that they “would not want to employ a model with an RMSEA > .1” (p.144). Acceptable values for the CMIN/df statistic vary widely among researchers. Yli-Luoma (1996) goes for a limit as high as 5, while more conservative researchers put the limit at 2 (e.g. Wheaton et al., 1977). Loo (1999), after studying Byrne (1989), Carmines & McIver (1981) and Marsh & Hocevar (1985) suggested a maximum value of 3 for CMIN/df. The CFI also addresses fit of data and model with values close to 1 indicating good fit (Bentler, 1990). Cuttance (1987) and Hu & Bentler (1995) suggested a value greater than .90 for the GFI to represent a strong fit. For the purpose of the present research, the statistics chosen are as follows: the absolute fit measure of chi square, degree of freedom and its corresponding probability and the relative (descriptive) fit statistics of CMIN/df at cut-off level below 5, GFI, AGFI and CFI at above 0.9 and RMSEA at below 0.08.

Using AMOS, the researcher performed confirmatory factor analysis to test the fit between the theorised model and the observed data collected. However, for AMOS to perform confirmatory factor analysis, multivariate normality is assumed. A major consequence of violating multivariate normality is that the computed chi-square values are inflated. This may result in the rejection of a model, despite its being correct. Multivariate normality of the observed data was tested using Mardia's coefficient values (Mardia, 1970). If the value of the observed data exceeds the limit of 1.96 set in Mardia's coefficient (Byrne, 2001) this indicates violation of normality

assumption. The multivariate non-normality in the data, though common in real-world data, if it was too severe for remedial action to be taken, would necessitate the use of asymptotically distribution free (ADF) methods in AMOS. Despite receiving some criticisms (Bollen, 1989), ADF estimation's main advantage is that it does not impose a multivariate normality assumption. Furthermore, it is reputed to generate reliable estimates in large samples (Browne and Cudeck, 1993). A requirement of the ADF method in AMOS is that there be no missing data at all and this can be achieved by replacing the missing data using imputation methods. It should be noted that maximum likelihood is still the preferred estimation method as it provides better estimation over ADF. Therefore to preserve maximum likelihood estimation, bootstrapping methods (Byrne, 2001) can be invoked in AMOS. Bootstrapping makes estimations without being based on assumptions of normality and as such is a useful tool in the event of violations of multivariate normality. In the event of missing data, maximum likelihood can still be done in AMOS by choosing the option of "means and intercepts estimated".

### **9.2.2 List of Variables**

Prior to investigating the substructure of the questionnaire, an explanation of the variables and subsequent variables derived from them that form the questionnaire is necessary. The questionnaire used in the present research generated a total of 185 self-report variables (Table 9.1). From these, new variables were further derived as a result of calculations performed on the original variables (Table 9.2a, 9.2b and 9.2c).

**Table 9.1: Summary of self-report variables**

Abbreviation	Name of variable	Description/question	Scores
gender	Gender	Respondent's gender	1-2
Age	Age	Respondent's age	
Srv_clss	Service Classification	Respondent's job service classification	1-19
grade	Job grade	Respondent's job grade	
Edu_lvl	Education level	Respondent's education level	1-5
yr_mgt	Year management	Number of years in management function	actual
yrnonmgt	Year non-management	Number of years in non-management function	actual
num_stf	Number of staff	Number of staff currently under supervision	actual
excl	Excellence Award	Received excellence award in the past	1-2
yr_excl	Year excellence	Year excellence award received	actual
course	Course title	Name of course presently attending at INTAN	
TK1-TK81	Tacit Knowledge	Tacit knowledge items	1-7
LSI1-LSI48	Learning styles	Learning style items	1-7
LS1-LS16	Learning strategies	Learning strategy items	1-7

As discussed in the Research Methodology chapter, the TKIM requires the identification of an expert profile. Unlike previous studies (e.g. Nestor-Baker & Hoy, 2001; Horvath et al., 1999) that selected expert panels on the basis of so called established experts or long-serving, very experienced managers, in this study they were chosen from among respondents that had received a Service Excellence Award (see Appendix F for detailed explanation of the criteria for identifying experts). Using this criterion, 37 subjects were identified for the expert group and 319 for the novice and typical manager group.

**Table 9.2a: Summary of TKIM derived variables**

Abbreviation	Name of variable	Description/question
Ztk1-ztk81	Corrected TK	TK ratings corrected for subject's individual differences
Dtk1-dtk81	Differentiated TK rating	TK item ratings as against expert profiles
avsit1-avsit8	Situation 1– Situation 8	Mean score for each testlet/situation
Task	Task	Managing task score
self	Self	Managing self score
others	Others	Managing others score
Totaltk	Total TK	Overall tacit knowledge score

**Table 9.2b: Summary of LSI derived variables**

Abbreviation	Name of variable	Description/question
Ce	CE	Concrete Experience
Ac	AC	Abstract Conceptualization
Ae	AE	Active Experimentation
Ro	RO	Reflective Observation
ac_ce	AC–CE	AC-CE continuum
ae_ro	AE–RO	AE-RO continuum
style1	Learning styles	
rank_ce	Rank of CE	CE items are rank ordered in ascending order
Cequart	CE Quartiles	CE items divided into quartiles
rank_ac	Rank of AC	AC items are rank ordered in ascending order
Acquart	AC Quartiles	AC items divided into quartiles
rank_ae	Rank of AE	AE items are rank ordered in ascending order
Aequart	AE Quartiles	AE items divided into quartiles
rank_ro	Rank of RO	RO items are rank ordered in ascending order
Roquart	RO Quartiles	RO items divided into quartiles
Top		1 = highest quartile; 2 = middle/mix 3 = lowest quartile
yr_exp	Total experience	yr_mgt + yrnonmgt
Predom	Predominant	1 = predominantly managerial, 2 = predominantly non-managerial

**Table 9.2c: Summary of LSQ derived variables**

Abbreviation	Name of variable	Description/question
m_st	Men St	Mental Strategy
b_st	Beh St	Behavioural St
s_st	Self St	Self-Efficacy St
Tstrat		Overall Strategy
Newgrp	Sample Groups	1 = experts, 2 = typical, 3 = novices

The method of scoring the TKIM is discussed in greater detail in Appendix G. This procedure gives rise to a score for the level of managerial tacit knowledge for every novice and typical manager compared with the expert group. The relative level of managerial tacit knowledge ranged from between 0.67 to 1.84 for the 319 cases of novice and typical managers. Sternberg & Grigorenko (2001a) noted the small range of scores obtained in most research involving difference scoring, such as in expert-novice comparison studies. Tacit knowledge items were scored according to its associated situations. Scores were also obtained for each of the context of managing self, task and others. Managing self was made up of situations 3 and 7; managing task – situations 4, 5, and 6, and managing others – situations 1, 2 and 8. Finally, an overall tacit knowledge score was calculated from the item scores to represent a single tacit knowledge score.

Learning style items also went through several permutations before arriving at a final score for analysis. Raw scores were obtained for each of the respective learning modes: Concrete Experience, Abstract Conceptualization, Active Experimentation, Reflective Observation. The two continua of CE-AC and AE-RO were then computed before subjects' learning styles were determined. Appendix H details the scoring for the normative version of the LSI. For the purpose of answering



hypothesis 6, each CE score was ranked in ascending order and later divided into quartiles. Those subjects that fell into the highest quartile were labelled 1, those in the second highest quartile labelled 2, those in the third highest labelled 3 and those that fell into the lowest quartile were labelled 4. This procedure was then repeated for the other learning modes of AC, AE and RO. A new variable was then derived with subjects scoring in the highest quartile in all four learning modes labelled 1, those scoring lowest in all four learning modes labelled 3 while those that had a mix of scores in any other order were labelled 2.

Learning strategies had the least transformation of the three instruments, with scores summed up to form the respective groups of Mental Strategy, Behavioural Strategy, and Self-Efficacy Strategy. An overall strategy score was also calculated from the sum of all the components.

### 9.2.3 The TKIM

The first step taken was to perform univariate analysis on the raw data, including testing the normality of the observed variables, because this criterion is important for many statistical tests. Statistics for kurtosis and skewness, and Kolmogorov-Smirnov tests are used in normality testing. The One-sample Kolmogorov-Smirnov Test procedure indicated that 78 of the 81 TKIM items violated the normal distribution test. All the items were also negatively skewed. In order to perform certain parametric statistical tests, it is necessary to have data that are normally distributed (Sokal and Rohlf, 1995). Therefore, the non-normal TKIM items were first transformed before statistical tests that required normal assumptions were used.

There are several options available to transform the data; however it was observed that a logarithm transformation was sufficient to normalize it.

**Table 9.3: Internal consistency reliability estimates of the TKIM**

	Mean	SD	$\alpha$
Self	0.87	.21	.52
Task	0.87	.19	.58
Others	0.98	.19	.52
All	0.91	.15	.72

Note:  $\alpha$  = Cronbach Alpha. Self, Task and Others are computed on mean values as they were made up of unequal number of items.

Except for the overall, Cronbach's  $\alpha$  values for the three subcomponents are low<sup>1</sup> (Table 9.3). There exist significant intercorrelations among the three subcomponents (Table 9.4) reflecting the weak fit statistics reported below and raising concerns over multicollinearity. However, the intercorrelation values of 0.43, 0.33 and 0.22 for the three subcomponents are much less than 0.70 and this, according to Gunst & Mason (1980) cannot be considered as evidence of multicollinearity. Therefore, this suggests that the three components of the TKIM - self, task and others - are free from the threat of multicollinearity.

**Table 9.4: Intercorrelations among the three subcomponents of TKIM**

	1	2	3
Task	-		
Self	.43**	-	
Others	.33**	.22**	-

\*\*p < 0.01 (2-tailed), N=319

<sup>1</sup> The overall alpha obtained in the present study is consistent with previous studies that used the TKIM. Other reported alphas on the TKIM are 0.85 (Colonia-Willner, 1998), 0.79 (Wagner, 1987), 0.70 (Menkes, 2002), 0.68 (Wagner & Sternberg, 1985).

Confirmatory factor analysis was next performed using the Structural Equation Modelling (SEM) approach to test the fit between the TKIM measures. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy value of 0.549 and the Bartlett's Test of Sphericity (approximate  $\chi^2 = 5215.15$ ,  $df = 3240$ ,  $p < .001$ ) indicate that the tacit knowledge dataset is appropriate for factor analysis. Each subcomponent was examined as a single-factor model and its respective items as the manifest variables. The overall TKIM instrument (see Table 9.5) was then tested as a single factor model with the sub-components of self, task and others as the associated manifest variables.

Table 9.5 shows the fit statistics for the subcomponents of self, task and others. In general, the fit statistics showed a rather weak fit. Most noticeable is the Comparative Fit Index (CFI) measure that compares the model to the more stringent independence model, where none of the subcomponents came close to the 0.9 limit set. However, the single factor solution shown in the table as "overall" produced an acceptable level of relative fit measures with the CFI at 0.84, this being the highest value attained for that measure, and meeting the less stringent criteria set by Doll & Xia (1994). This result provides support for the use of the TKIM in the present research because, as will be discussed later, the TKIM is used as a single measure of tacit knowledge.

Further analysis using the traditional method of confirmatory factor analysis was employed to investigate the substructure of the TKIM as proposed by Wagner & Sternberg (1985): managing self, managing task and managing others. According to Garson (2001b), the traditional method of CFA is a useful supplement to the

Structural Equation Modelling method of CFA as it permits a more detailed insight than the single coefficient goodness-of-fit measures provided in the SEM approach.

**Table 9.5: Confirmatory factor analyses of the TKIM**

	$\chi^2$	df	MC	CMIN /df	GFI	AGFI	CFI	RMSEA
Self	314.7*	170	16.2	1.85	.91	.90	.41	.052
Task	818.1*	407	52.8	2.01	.85	.83	.36	.056
Others	698.9*	436	28.6	1.60	.87	.86	.38	.044
All	34.65*	20	3.55	1.73	.97	.95	.84	.048

Note: Bootstrapped ML is used whenever Mardia's Coefficient exceeds 1.96.  $\chi^2$  = Chi-square, MC = Mardia's Coefficient. \*  $p < .05$ .

Table 9.6 shows the result of factor analysis on the subcomponents of TKIM extracted using Principal Axis Factoring with Varimax rotation and Kaiser normalization. The items were forced to load on three factors, with loadings below 0.3 being suppressed (De Vaus, 1996).

Thirty-one of the eighty-one items loaded significantly at the specified level on the three factors. No clear pattern emerged to support the theorised model espoused by Wagner & Sternberg (1985). The three extracted factors accounted for only 10.2% of the variance. A more confusing pattern came out from factor analysis using the Kaiser Criterion (selecting factors with eigenvalues greater than one) where thirty-two different factors were extracted and this was achieved only after 50 iterations.

**Table 9.6: Rotated Factor Matrix of TKIM Subcomponents**

	1	2	3
<b>Managing Task</b>			
TK44	0.50		
TK45	0.42		
TK59	0.39		
TK42	0.36		
TK37	0.34		
TK32	0.33		
TK48		0.40	
TK38		0.40	
TK46		0.33	
TK53			0.53
TK55			0.53
TK54			0.48
TK60			0.38
TK57			0.36
TK58			0.36
TK52			0.34
<b>Managing Self</b>			
TK22	0.44		
TK21	0.40		
TK29		0.31	
TK61			0.34
TK68			0.30
<b>Managing Others</b>			
TK20	0.42		
TK5	0.36		
TK4	0.30		
TK8		0.53	
TK10		0.45	
TK76		0.42	
TK81		0.42	
TK15		0.39	
TK6		0.36	
TK75			0.32

**Notes:**

Forced loading into 3 factors with minimum loading of 0.3

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations.

A measure to counter this problem was proposed through the use of testlets. Each situation presented in the TKIM represents a testlet. Situation-based problems have been claimed to result in a possible dependency among items associated with a particular situation (Wainer & Mislevy, 1990). This is evident from the determinant value of  $4.94E^{-17}$  which indicates multicollinearity among the items (Field, 2000). For this reason it was proposed that these interrelated items within a testlet should be analysed as a single unit (Wainer & Kiely, 1987). Besides minimizing the number of parameters, benefits claimed for using testlets are that it increases the items' reliability as an indicator to a construct, produces stable parameter estimates and consequently yields a solid construct measurement (Mavondo & Farrell, 2000; Russell et al., 1998).

The intercorrelations among the eight TKIM situations/testlets are shown in Table 9.7. Factor analysis for appropriateness of the testlets yielded a KMO value of 0.70 and a significant result on Bartlett's Test of Sphericity (approximate  $\chi^2 = 157.99$ ,  $df = 28$ ,  $p < .001$ ). Meanwhile, the determinant value of 0.605 indicates that there is no multicollinearity among the variables (Field, 2000). Each situation was tested as a single-factor model. Each scale item loaded only on its appropriate latent variable.

Principal axis factoring extracted three factors with eigenvalues above one, explaining 51.89% of the total variance. Communalities achieved from the extraction are presented in Table 9.8 with a general increase in values in the extracted compared to the initial communalities.

**Table 9.7: Intercorrelations among the eight TKIM testlets**

	1	2	3	4	5	6	7
Situation 1	-						
Situation 2	.24**	-					
Situation 3	.17**	.16**	-				
Situation 4	.17**	.13*	.28**	-			
Situation 5	.16**	.13*	.25**	.20**	-		
Situation 6	.14*	.15**	.21**	.15**	.08	-	
Situation 7	.08	.06	.20**	.26**	.08	.20**	-
Situation 8	.10	.03	.02	.11*	.23**	.07	.15**

\*\* p < 0.01 (2-tailed), \* p < 0.05 (2-tailed). N=319

The rotated factor matrix of the testlets showed that only four of the eight testlets loaded at the specified significant level of above 0.4. Situation 7, meant to assess managing self, loaded on factor 1. Situations 1 and 2, meant for managing others, loaded onto factor 2, while situation 5, for managing task, loaded on the third factor (Table 9.9).

**Table 9.8: Communalities of TKIM testlets**

	Initial	Extraction
SIT1	.102	.229
SIT2	9.014E-02	.237
SIT3	.128	.196
SIT4	.132	.218
SIT5	.111	.499
SIT6	9.310E-02	.164
SIT7	.108	.445
SIT8	6.559E-02	.104

Extraction Method: Principal Axis Factoring

**Table 9.9: Rotated Factor Matrix of TKIM Testlets**

	Factor		
	1	2	3
SIT1		0.46	
SIT2		0.48	
SIT5			0.69
SIT7	0.66		

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations.

The result of the above analysis shows weak support for the three subcomponents of managing self, task and others in the TKIM. Kerr (1991) in her psychometric analysis of the TKIM has found incoherent factor structure similar to those found in the present study. While Kerr did not postulate possible reasons for this, the present study proposed that the scoring system of the TKIM may account for this result. This will be further elaborated in the conclusion.

Consistent with other findings (e.g. Jagmin et al., 1989; Kerr, 1991; Wagner, 1987) evidence in this analysis favours the use of the TKIM as one total score of tacit knowledge, rather than its being divided into its subcomponents. This was indicated by the acceptable fit statistics for the single factor solution, the lack of structural evidence in its factor analysis, significant interrelationship between the subcomponents (self, task and others) and a relatively high reliability estimate of the instrument as a whole (Menkes, 2002). Furthermore, the requirements of the present research, in terms of the hypothesis to be tested, did not demand that the analysis be broken down into its subcomponents.



#### 9.2.4 The normative version of the LSI

Univariate analysis of the LSI items shows that most of them are not normally distributed. Attempts to normalize using square root, logarithm and power transformations all fail the Kolmogorov-Smirnov test. The use of non-parametric tests for analysis of the data is also ruled out as evidence seems to suggest that non-parametric instruments are also vulnerable to non-normality (e.g. Zimmerman, 1998). Visual observations of the data show that the distribution suffers mostly from extreme kurtosis. This is to be expected as all 319 responses for each variable fall within the small range of 1 to 7. Attempts to improve the distribution were made with square root transformation. Despite still not meeting the stringent criteria of the K-S test<sup>2</sup> (including with Lilliefors correction), the resultant data do fall within the less stringent limit of +/-2 for skewness and kurtosis (Garson, 2001d). The data were therefore used for tests assuming normality.

**Table 9.10: Internal consistency reliability estimates of the learning styles items**

	Mean	SD	$\alpha$
CE	4.79	.78	.85
AC	5.39	.68	.87
AE	5.46	.73	.88
RO	5.19	.68	.82
AC-CE	0.59	.70	
AE-RO	0.27	.63	

Note:  $\alpha$  = Cronbach Alpha, SD = Standard Deviation

The normative version of the LSI shows high levels of internal consistency and reliability (Table 9.10). Cronbach  $\alpha$  values exceed the 0.8 levels for all scales. Table

<sup>2</sup> Garson (2001d) noted that the Kolmogorov-Smirnov test is sensitive to unimportant deviations from normality when sample sizes are large and advised researchers to counter check the result with other normality criteria.

9.11 indicates significant levels of intercorrelation among the subscales. There is however, no concern over multicollinearity between the subscales because, except for the correlation between AC and AE, the other correlations are below the limit of 0.7 defined by Gunst & Mason (1980) as high.

**Table 9.11: Intercorrelations among the subcomponents of LSI**

	1	2	3	4	5	6
CE	-					
AC	.524**	-				
AE	.593**	.705**	-			
RO	.597**	.682**	.608**	-		
AC-CE	-.575**	.396**	.038	.012	-	
AE-RO	.042	.080	.504**	-.380**	.032	-

\*\* p < 0.01 (2-tailed). N=356

Confirmatory factor analysis (CFA) using Structural Equation Modelling (SEM) method was performed to observe the fit between the data to the components of the normative version of the LSI. The values of Bartlett's test of sphericity (.000) and KMO (.919) indicate that the data are appropriate for factor analysis. The determinant value of  $5.05E^{-13}$ , despite indicating the existence of multicollinearity, is to be expected because the entire 48 items are meant to measure the four constructs of CE, AE, AC and RO. The four learning modes were tested as single-factor solutions with each scale items loading on its respective factor. The two dimensions of AC-CE and AE-RO were, however, examined as two-factor models in which each scale item loaded only on its appropriate latent variable. The latent variables were free to correlate.

The CFA results for the components of the normative version of the LSI are presented in Table 9.12. The fit for all the four learning modes as well as the two

dimensions is poor, as indicated by both the absolute fit and relative fit measures. Loo (1999), who also found poor fit support for the four learning modes and the two dimensions, proposed the use of rating scales to counter the shortcomings of ipsative scales that he used. However, the results of the present study showed that the same issues still persist with the measure, even with the use of rating scales.

**Table 9.12: Confirmatory factor analyses of the learning styles items**

	$\chi^2$	df	MC	CMIN /df	GFI	AGFI	CFI	RMSEA
CE	551.8*	54	67.6	10.22	.70	.57	.65	.170
AC	284.2*	54	69.2	5.26	.86	.80	.84	.116
AE	241.1*	54	61.0	4.46	.89	.84	.89	.104
RO	291.9*	54	83.4	5.41	.87	.81	.82	.118
AC-CE	1325*	251	226	5.28	.68	.61	.68	.116
AE-RO	923.7*	251	237	3.68	.79	.75	.81	.092

Note: Bootstrapped ML is used whenever Mardia's Coefficient exceeds 1.96.

$\alpha$  = Cronbach Alpha,  $\chi^2$  = Chi-square, MC = Mardia's Coefficient

\*  $p < .05$

Further testing was undertaken to clarify the factor structure of the LSI. The traditional method of confirmatory factor analysis was employed in order to conduct a more detailed analysis. Besides the four learning modes and the two dimensions of AC-CE and AE-RO, Kolb's theory proposed the existence of the two dimensions as bipolar continuums. If the current data were to support this notion, it is expected that factor analysis would produce two factors with AC and CE loading onto one of the factors and AE and RO loading onto the other. Additionally, there would be a significant negative correlation from AC to CE and from AE to RO.

Factor analysis was performed on all 48 items and items were forced to load on two factors. All item loadings were reported in order to observe the overall pattern. The

result (Table 9.13) shows that the items do not fall as anticipated when forced to load onto two factors and therefore the present study provides no support for the bipolar dimensions of AC-CE or AE-RO. Previous studies have also obtained mixed results on the existence of the two bipolar dimensions. There is substantial evidence to suggest that the existence of the two bipolar dimensions is an artefact of the ipsative measures (Gorsuch, 1974 cited in Geiger et al, 1993). This is also indicated in findings such as the factor analytic study by Loo (1999).

**Table 9.13: Pattern Matrix of the learning styles items**

	AC-CE		AE-RO		
	1	2	1	2	
AC1	0.51	-0.11	AE2	0.51	-0.24
AC3	0.57	-0.24	AE5	0.66	-0.10
AC4	0.56	-0.05	AE7	0.69	-0.15
AC10	0.54	0.09	AE8	0.55	0.02
AC12	0.58	0.00	AE19	0.41	0.25
AC16	0.31	0.31	AE20	0.59	0.02
AC27	0.62	-0.02	AE24	0.65	-0.05
AC34	0.50	0.15	AE28	0.77	-0.03
AC36	0.75	-0.05	AE30	0.65	-0.03
AC37	0.71	-0.08	AE32	0.77	-0.02
AC38	0.57	0.11	AE35	0.74	-0.08
AC43	0.60	0.08	AE42	0.62	0.03
CE6	0.00	0.74	RO11	-0.09	0.38
CE9	0.01	0.75	RO13	0.64	-0.03
CE14	0.40	0.23	RO15	0.35	0.06
CE17	0.65	-0.01	RO22	0.75	-0.01
CE18	0.74	-0.08	RO25	0.47	0.31
CE21	0.00	0.73	RO29	0.73	-0.08
CE23	0.47	0.31	RO31	0.48	0.18
CE26	0.48	0.17	RO33	0.51	0.25
CE39	0.07	0.70	RO45	-0.02	0.37
CE40	0.30	0.51	RO46	0.55	0.12
CE41	0.74	-0.02	RO47	0.55	0.14
CE44	0.30	0.37	RO48	0.55	0.14

Extraction Method: Principal Axis Factoring.

Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 6 iterations.

On the other hand, findings from several other studies (e.g. Loo, 1996; Willcoxson and Prosser, 1996) suggest that the four learning modes may exist as independent dimensions. Loo (1996) for instance found that RO and CE items loaded onto factor 1, AE items loaded onto factor 2, and a mixture of AC and CE items loaded onto factors 3 and 4. To observe this pattern in the present study, factor analysis was repeated and items were forced to load on four factors with loadings above 0.5 reported to get a clearer pattern. Rotation converged in six iterations using varimax with Kaiser Normalization (Table 9.14).

Eight of the twelve items set out to measure Active Experimentation (AE) loaded significantly onto factor 1. However, three items from Concrete Experience (CE) and one from Reflective Observation (RO) also loaded onto the same factor. Eight items of the total twelve items set out to measure Abstract Conceptualization (AC) loaded exclusively onto factor 2 without any contamination from any other items. Six of the twelve items meant for RO loaded on factor 3 with one item each from AE and CE also loading there. Finally, six of the twelve items set to measure CE loaded significantly and exclusively onto factor 4. Factor analysis was run again after items that cross-loaded were dropped (Comrey & Lee, 1992). This time the four learning modes loaded independently on four different factors. When AMOS was once again run on the remaining items, the fit measures (Table 9.15) showed some improvement over the previous fit results (Table 9.12), although most of them still did not meet the cut-off points required. The existence of the four learning modes (as theorised in Kolb's model) in Geiger's normative version of the LSI is crucial as it is the prerequisite for the creation of the four learning styles of Accommodators, Divergers, Assimilators and Convergengers.

**Table 9.14: Item loadings of the normative version of LSI**

Factor 1		Active Experimentation	
Significant Items	Loadings	Other Items	Loadings
AE42	0.70	CE17	0.65
AE8	0.66	CE18	0.64
AE24	0.61	CE41	0.61
AE7	0.58	RO22	0.58
AE35	0.53		
AE28	0.52		
AE30	0.52		
AE5	0.50		
Factor 2		Abstract Conceptualization	
Significant Items	Loadings	Other Items	Loadings
AC10	0.67		
AC4	0.67		
AC36	0.64		
AC12	0.62		
AC37	0.59		
AC3	0.57		
AC43	0.52		
AC1	0.51		
Factor 3		Reflective Observation	
Significant Items	Loadings	Other Items	Loadings
RO46	0.76	AE32	0.52
RO31	0.71	CE26	0.51
RO33	0.66		
RO48	0.63		
RO25	0.55		
RO13	0.51		
Factor 4		Concrete Experience	
Significant Items	Loadings	Other Items	Loadings
CE9	0.83		
CE6	0.80		
CE21	0.79		
CE39	0.75		
CE40	0.61		
CE44	0.51		

**Notes:**

Forced loading into 4 factors with minimum loading of 0.5

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 6 iterations.

**Table 9.15: Confirmatory factor analyses of the factor analyzed learning styles items**

	$\chi^2$	df	MC	CMIN/df	GFI	AGFI	CFI	RMSEA
CE	62.5*	9	31.14	6.96	.93	.84	.93	.137
AC	138.3*	20	30.91	6.92	.90	.82	.87	.136
AE	167.9*	20	27.88	8.40	.89	.80	.87	.153
RO	37.6*	9	31.55	4.17	.96	.91	.96	.100
AC-CE	314*	76	94.82	4.13	.87	.82	.87	.099
AE-RO	349*	76	93.06	4.59	.87	.82	.86	.106

Note: Bootstrapped ML is used whenever Mardia's Coefficient exceeds 1.96.

$\chi^2$  = Chi-square, MC = Mardia's Coefficient

\*  $p < .05$

Despite all the advantages accorded by the use of normative over ipsative scales as discussed in Chapter 7, its one limitation is in highlighting differences within the measure. Respondents may have the tendency to answer it as an ability measure, therefore diffusing the differences in the learning modes. Therefore, more important within this debate is to prove the existence of the learning modes. However, confirmatory factor analysis has not shown strong support for the existence of the four learning modes. Notwithstanding this, the scoring system of subtracting CE scores from AC scores and RO scores from AE scores does produce a continuum of AC-CE and AE-RO and this then can be used to create the four learning styles.

### 9.2.5 Learning Strategies

Univariate analysis showed that the learning strategy items do not display a normal distribution. As with the learning style items, the criteria of +/-2 for both skewness and kurtosis was set as the limit of normality. A square root transformation manages to normalize the learning strategy items and is then used for tests with normal distribution assumptions.

**Table 9.16: Confirmatory factor analyses of the learning strategy items**

	$\alpha$	Mean	SD	$\chi^2$	df	MC	CMIN /df	GFI	AGFI	CFI	RMSEA
Men St	.75	5.25	.86	20.48*	2	8.32	10.24	.98	.84	.95	.17
Beh St	.73	5.27	.80	90.70*	9	17.06	10.08	.91	.79	.85	.17
Self St	.78	4.80	.83	61.93*	9	12.64	6.88	.94	.87	.87	.14
Overall	.89	5.09	.89	562.7*	104	107.8	5.41	.81	.75	.78	.12

Note: Bootstrapped ML is used whenever Mardia's Coefficient exceeds 1.96.

$\alpha$  = Cronbach Alpha,  $\chi^2$  = Chi-square, MC = Mardia's Coefficient

\*  $p < .05$

Confirmatory factor analysis using AMOS was performed on the learning strategy items. The KMO value of 0.88 and Bartlett's test of sphericity (.000) indicate that the learning strategy items met the criteria for factor analysis. Each subcomponent was examined as a single-factor model and its respective items as the manifest variables. The overall statistics was tested as a single-factor model with the subcomponents as the associated manifest variables. Table 9.16 shows the result of the confirmatory factor analysis. In general it can be concluded that the theorised substructure in the model does not provide a good fit for the observed data.

Traditional CFA was next performed on the learning strategy items. Items were forced to load onto three factors with loadings below 0.4 suppressed. The results presented in Table 9.17 show that no clear pattern emerging from the process.

As with the TKIM measure discussed earlier, the research questions and hypotheses outlined in the present research do not demand that learning strategy be analysed by its substructures. Therefore, adopting a similar line of argument to that used for the TKIM instrument discussed earlier, it is sufficient to group together all the items as a single measure of learning strategy. Despite the lack of fit for a single factor model, several other items of evidence support this decision: a significant intercorrelation



between the learning strategy subcomponents (Table 9.18), relatively low reliability estimates of the subcomponents compared to the whole (Table 9.16), and the lack of any structural evidence in the learning strategies factor analysis.

**Table 9.17: Rotated Factor Matrix of the learning strategy subcomponents**

	1	2	3
<b>Mental St</b>			
M_st6	0.71		
M_st5	0.70		
M_st3	0.52		
M_st1	0.42	0.44	
<b>Behavioural St</b>			
B_st15		0.70	
B_st12		0.62	
B_st16		0.57	
B_st8	0.65		
B_st11			0.48
<b>Self-Efficacy St</b>			
S_st14		0.61	
S_st13		0.56	
S_st2		0.45	
S_st7	0.64		
S_st4	0.51		
S_st10			0.78

**Notes:**

Forced loading into 3 factors with minimum loading of 0.4

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations.

**Table 9.18: Intercorrelations among the subcomponents of learning strategies**

Strategies	1	2	3
Mental	-		
Behavioural	.63**	-	
Self-Efficacy	.67**	.73**	-

\*\* p < 0.01 (2-tailed). N=319

### 9.3 Hypotheses Testing

Having observed the psychometric properties of the questionnaire components, we will now proceed to test the research hypotheses outlined at the end of Chapter 5. Hypotheses are usually tested in the form of a null hypothesis, symbolized with  $H_0$ . The researcher will be able either to reject or to refute the null hypothesis depending on the result of the test performed on the observed data. This result is determined by the significance of the difference (or no difference, as is the usual test proposition of the null hypothesis) between the observed value of a statistic and the hypothesized value of the parameter. The level of significance is usually determined at either the 0.05, 0.01 or 0.001 level. These can be considered to represent acceptable significance, strong significance and high significance respectively.

#### *9.3.1 Hypothesis 1: Expert managers will have accumulated significantly higher levels of managerial tacit knowledge than other groups of employees within a related work context.*

To test for a previously reported phenomenon that expert-novice groups within the same professional context differ in levels of accumulated tacit knowledge (e.g. Nestor-Baker, 1999; Patel *et al.*, 1999) a comparison was made between the expert group and the novice and typical groups defined above<sup>3</sup>. The null hypothesis in this

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<sup>3</sup> It should be noted that strictly, there should be no score for the experts. This is because the experts are only used to create relative scores for the other subjects (novice and typical). In the present case, the experts' scores are only computed to answer Hypothesis 1, which attempted to find differences in LAMTK between the groups and by doing so, show that the present study is consistent with previous findings. Scoring for the experts was done in the same way as for the other subjects discussed earlier. Therefore, the scores of the experts would obviously be the largest because the mean ratings used to obtain the overall scores came from their own group (i.e. the differences will be the smallest). The creation of experts' scores in this study should be taken with caution as this has never been done in other similar studies using TKIM (e.g. Colonia-Willner, 1998; Menkes, 2002). Other scoring methods, such as the 'rules of thumb' scoring system, should be employed if the primary interest is to compare

test is that there is no difference in LAMTK between the groups. The mean scores on LAMTK for each of the three groups are shown in Table 9.19. Again, the small range of scores in the table reflects the prototype-based scoring system used in the TKIM, which measures differences in scores of novice and typical groups compared with the expert group.

One-way analysis of variance ( $F=5.37$ ,  $df=2$ ,  $p=0.005$ ) indicated that there were significant differences between the three groups. However, Levene's statistic, which tests one of ANOVA's assumptions, that of homogeneity of variances, shows that it was violated. Homogeneity of variances means that each of the three groups should have the same variance. In the event of violation of the assumption, SPSS provides an alternative with the Robust Test of the Equality of Means in the form of Welsch and Brown-Forsythe tests (Field, 2000). The Welsch F-ratio,  $F(2,92) = 3.78$ ,  $p<.05$  showed significant difference between the three groups in their levels of accumulated managerial tacit knowledge.

**Table 9.19: Comparisons of LAMTK scores for novice, typical and expert groups**

Group	n	Mean	Std. Deviation	df	F
Novice	113	0.944 <sup>3</sup>	.190	2, 92	3.78*
Typical	206	0.893	.111		
Expert	37	0.882 <sup>1</sup>	.125		

\*  $p<0.05$

Superscript to a mean refers to a group whose mean is significantly different (Games-Howell multiple comparison test)

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experts and novices (Wagner et al., 1999). The expert samples and its corresponding scores were later removed from the overall sample prior to further hypothesis testing, as their inclusion might bias findings, since the scoring for the novice and typical groups is relative to it.

SPSS also offer post-hoc tests under conditions of violation of the homogeneity assumption. A common test under such conditions is the Games-Howell. The result of the post-hoc comparisons is shown in Table 9.19 where it is revealed that the novice group had significantly lower LAMTK than the expert group. Whilst it can be seen from Table 9.19 that the expert manager group also had higher levels of LAMTK than the typical group, the difference was not significant. Hypothesis 1 is therefore only partially supported.

**9.3.2 Hypothesis 2: *There is a significant relationship between the length of general experience and the level of accumulated managerial tacit knowledge (LAMTK).***

The null hypothesis for this test states that there is no relationship between length of general experience and LAMTK. This hypothesis can be tested using Pearson's Product Moment Correlation. However, Pearson's  $r$  can be susceptible to abnormal data distribution. The length of general experience variable was sufficiently normal, but the overall tacit knowledge score suffered from abnormal distribution and therefore, its normalized version was used for the analysis. The correlation analysis for the whole group of subjects revealed that no significant relationship existed between length of general experience and levels of accumulated managerial tacit knowledge ( $r = -0.061$ ,  $n = 319$ ,  $p=0.276$ ) and the null hypothesis was therefore accepted. Nor were there significant correlations between length of general experience and LAMTK when the sample was divided into typical ( $r = 0.054$ ,  $n = 206$ ,  $p=0.443$ ) or novice ( $r = -0.054$ ,  $n = 113$ ,  $p=0.568$ ) groups. Therefore the research hypothesis that there is a relationship between length of general experience and LAMTK is not supported.

### 9.3.3 Hypothesis 3: There is a significant relationship between learning styles and LAMTK.

Table 9.20 shows the descriptive statistics for values of LAMTK for subjects whose dominant learning styles fall into each of the four learning style categories defined by Kolb's (1984) learning style theory. As mentioned earlier, the small range of scores in the table reflects the prototype-based scoring system used in the TKIM, which measures differences in scores of novice and typical groups compared with the expert group.

As the independent variable, learning styles, is categorical whereas the dependent variable is an interval scale, ANOVA is best used to test their relationship. The null hypothesis states that there is no difference in the means of the four groups of the independent variable. One-way analysis of variance ( $F = 5.21, p = 0.002$ ) indicated that there were significant differences between the four groups. However, Levene's statistic shows that the assumption on homogeneity of variances, which means that each of the four learning styles should have the same variance, was violated. Therefore, using the Robust Test of the Equality of Means (Field, 2000), the Welch F-ratio,  $F(3,162.32) = 4.27, p < .01$  showed a significant difference between the different learning styles and the levels of accumulated managerial tacit knowledge.

**Table 9.20: Descriptive Statistics for LAMTK Scores for Each of Kolb's Learning Styles ('Novice' and 'Typical' Groups Combined)**

Learning styles	n	Mean	Std. Deviation
Accommodator	74	0.90	.096
Diverger	74	0.96	.195
Assimilator	71	0.92	.156
Converger	100	0.88	.114
Total	319	0.91	.146

The result of the Games-Howell post-hoc comparisons test is shown in Table 9.21 where it is revealed that Convergents had significantly higher LAMTK than Divergers. Post-hoc comparisons with other learning styles, however, revealed no significant differences. Therefore, despite Convergents having the highest mean score on LAMTK, it cannot be categorically claimed that the convergent style is unique in explaining the effect of learning styles on tacit knowledge.

**Table 9.21: Post-Hoc comparison using Games-Howell test**

	1	2	3
Accommodator	-		
Diverger	.061	-	
Assimilator	.022	.039	-
Converger	-.024	.085*	.046

\* p<0.05

**9.3.4 Hypothesis 4: Subjects working in a predominantly managerial context will have a higher LAMTK than those employees who perform functions in a context that is relatively less managerial.**

In order to test whether subjects performing functions in a predominantly managerial context had a higher LAMTK than those who were performing relatively less managerial functions (H4), it was necessary to remove the novice group (< 1 year work experience) from the analysis because they would clearly not have gathered relevant contextual experience. The null hypothesis states that there will be no difference in LAMTK between the two groups. An independent sample t-test revealed that subjects performing predominantly managerial functions possessed

higher levels of managerial tacit knowledge ( $M = 0.874$ ,  $sd = 0.10$ ,  $n = 82$ ) than those who performed predominantly less managerial functions ( $M = 0.906$ ,  $sd = 0.12$ ,  $n = 124$ ). This result was found to be significant ( $t = -2.0$ ,  $p = 0.04$ , 2-tailed) and the null hypothesis was therefore rejected. This supports the notion that subjects performing functions in a predominantly managerial context had a higher LAMTK than those who perform less managerial functions in their work.

**9.3.5 Hypothesis 5: Subjects with accommodating learning styles who work predominantly in a management context will have a higher LAMTK than other subjects.**

Hypothesis 5 involved two independent variables; ‘learning styles’ and ‘managerial context’. A two-way ANOVA was therefore performed to determine possible interaction between these variables.

**Table 9.22: Two-way ANOVA of LAMTK by Learning Styles and Managerial Context**

		df	Mean Square	F	Sig.
	(Combined)	7	0.071	3.52	.001
Main Effects	Learning Styles	3	0.091	4.50	.004
	Managerial Context	1	0.005	0.24	.63
2-Way Interactions	Learning Styles * Managerial Context	3	0.058	2.85	.037

Table 9.22 shows that the main effects of learning styles are significant whereas managerial context is not. However, the two-way interaction of learning styles and managerial context is significant ( $F=2.85$ ,  $df=3$ ,  $p=.037$ ). Therefore, whilst learning styles is significantly related to LAMTK, this needs to be considered to be a joint interaction with managerial context. This finding would also impact earlier findings

made in Hypothesis 3 with regard to the relationship between learning styles and LAMTK.

That considered, the hypothesis that subjects with accommodating learning styles who predominantly perform managerial functions will have a higher LAMTK than other subjects (H5) will be tested next. In order to do this, the sample was divided into two groups. The first group, representing those who were reported to spend the majority of their working time performing managerial functions, and whose dominant learning style was accommodating, achieved higher LAMTK ( $M = 0.869$ ,  $sd = 0.079$ ,  $n = 43$ ) than the remaining subjects, who had a variety of diverging, converging or assimilating styles ( $M = 0.918$ ,  $sd = 0.15$ ,  $n = 276$ ). An independent samples t-test revealed that this difference was statistically significant ( $t = -3.19$ ,  $p = 0.002$ , 2-tailed). The research hypothesis is therefore supported.

In order to extend the data analysis, the mean scores on LAMTK for each of the four learning styles of those who were reported to spend the majority of their working time performing managerial functions are presented in Table 9.23. One-way analysis of variance ( $F=4.21$ ,  $df=3$ ,  $p=0.007$ ) and Duncan multiple-range tests indicate that the accommodators had significantly higher LAMTK than both divergers and assimilators. Whilst it can be seen from Table 9.23 that accommodators also have higher LAMTK than convergers, this difference was not significant.



**Table 9.23: Comparisons of LAMTK for the four learning styles of subjects working in a management context using one-way analysis of variance**

Group	Learning Styles	n	mean	Standard deviation	df	F
1	Accommodator	43	0.869 <sup>2,3</sup>	.079	3	4.21 <sup>**</sup>
2	Diverger	47	0.969 <sup>1,4</sup>	.214		
3	Assimilator	46	0.944 <sup>1</sup>	.182		
4	Converger	55	0.883 <sup>2</sup>	.132		

\*\* p=0.007

Superscript to a mean refers to a group whose mean is significantly different (Duncan multiple range test)

**9.3.6 Hypothesis 6: Subjects with higher scores on all four learning abilities/modes of Kolb's (1984) model will possess a higher LAMTK than other subjects who scored low on all four points of the experiential learning model.**

A Pearson correlation revealed a highly significant, though weak, relationship between the sum of the scores for all four LSI learning modes and LAMTK ( $r = -.183$ ,  $n = 319$ ,  $p = .001$ ), which provides partial support for Hypothesis 6. In order to test Kolb and Fry's (1975) assertion that the possession of all four different learning modes is critical for effective learning from experience, subjects were sorted according to their scores on the four points of the experiential learning model, CE, AC, AE and RO. Subjects whose magnitude of scores was in the upper quartile on all four points were regarded as the most robust learners. On the other hand, subjects that scored lowest on all four points of the experiential learning model, CE, AC, AE and RO would be expected to have a significantly lower LAMTK than those in the upper most quartiles. All other remaining subjects were grouped together to represent the middle two quartiles. The null hypothesis is that there is no significant difference

in LAMTK between those who scored in the upper most quartile on all four points and those that scored lowest on all four points of the experiential learning model.

**Table 9.24: Comparison of LAMTK for Kolb's four learning abilities using one-way analysis of variance**

Group	Quartiles	n	Mean	Std. Deviation	df	F
1	Upper Most	30	0.894 <sup>3</sup>	.120	2	8.45***
2	Middle	264	0.902 <sup>3</sup>	.129		
3	Lowest	25	1.023 <sup>1,2</sup>	.263		
	Total	319	0.911	.146		

\*\*\* p=0.000

Superscript to a mean refers to a group whose mean is significantly different (Duncan multiple range test)

Table 9.24 shows the descriptive statistics for values of LAMTK for each of the three groups. One-way analysis of variance ( $F = 8.45$ ,  $p = 0.000$ ) indicated that there were significant differences between the groups. Post-hoc comparisons using Duncan multiple range tests confirmed that subjects in the upper-most quartile have significantly higher LAMTK than those in the lowest quartile. This result provides support for the research hypothesis that subjects who scored high on all four learning abilities/modes of Kolb's (1984) model would possess a higher LAMTK than those who scored lowest on all four learning abilities/modes.

**9.3.7 Hypothesis 7: There will be no significant relationship between measures of learning strategies and LAMTK.**

Table 9.25 reveals a clear, statistically significant relationship between LAMTK and the total score for the learning strategies questionnaire (LSQ), as well as two of its three sub-scales. The research hypothesis (H7) that there will be no significant

relationship between measures of learning strategies and LAMTK is therefore refuted.

**Table 9.25: Pearson Correlation of Learning Strategies and Managerial Tacit Knowledge**

		Strategy Overall	Mental strategy	Behavioural strategy	Self-efficacy strategy
Tacit Knowledge	Pearson Correlation	-.174**	-.215**	-.175**	-.091
	Sig. (2-tailed)	.002	.000	.002	.105
	N	319	319	319	319

\*\* Correlation is significant at the 0.01 level (2-tailed).

#### 9.4 Further Analyses

Although the results of hypothesis testing confirmed the main proposition brought by the present research, that learning styles and the role of managerial context is significantly associated to the accumulation of managerial tacit knowledge, the result of Hypothesis 7 could be construed as confusing. This is because learning strategies was, unexpectedly, also found to be correlated with managerial tacit knowledge. This raised concerns as to whether the two measures of learning styles and learning strategies are actually measuring the same construct.

**Table 9.26: Intercorrelations between subcomponents of learning styles and learning strategy**

	CE	AC	AE	RO
Mental Strategy	.24**	.52**	.53**	.38**
Behavioural Strategy	.35**	.51**	.62**	.51**
Self-Efficacy Strategy	.27**	.49**	.48**	.44**

\*\*p < 0.01 (2-tailed) N=319

Further analyses were undertaken to determine the relationship between LSI and LSQ which may account for this unexpected finding. Because styles are categorical, association between the two independent variables was observed through its two dimensions of Concrete Experience-Abstract Conceptualisation (CE-AC) and Reflective Observation-Active Experimentation (RO-AE). The results indicate significant correlations between the LSQ, the CE – AC ( $r = 0.186, p < 0.01$ ) and RO – AE dimensions ( $r = 0.172, p < 0.01$ ) of the LSI. Furthermore, intercorrelations between the four learning modes of the LSI and the three subcomponents of learning strategy are highly significant (Table 9.26). This raised concerns over multicollinearity. However, all the values are less than the threshold for multicollinearity, set at above 0.7 by Gunst & Mason (1980) and 0.8 by Nunnally (1978). Therefore, it can be concluded that the measures of learning styles and learning strategies used in the present study are not multicollinear.

Exploratory factor analysis was performed to elucidate the interaction between the LSI and LSQ. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy value of 0.914 and the Bartlett's Test of Sphericity (approximate  $\chi^2 = 10954, df = 2016, p < .001$ ) indicates that the LSI and LSQ datasets are appropriate for factor analysis. Items with eigenvalues greater than one were extracted using Principal Axis Factoring with Varimax rotation and Kaiser normalization yielding thirteen factors. Items below loadings of 0.5 were suppressed. The thirteen factors accounted for 58% of total variance (Table 9.27). The loading pattern displays an interesting result. No learning style and learning strategy items overlapped together onto the same factor. Learning strategy items loaded onto factors 2, 8, 10, 11 and 12 while learning style

items loaded over the other remaining factors. Supported by this finding that both learning styles and learning strategies items loaded onto different factors and the above finding that the two variables are not multicollinear, it can therefore be concluded that the measures for learning styles and learning strategies are indeed measuring different constructs.

After clarifying that the two variables are not measuring the same construct, the significance of learning styles' contribution towards the accumulation of tacit knowledge can be observed using an Analysis of Covariance (ANCOVA). This is done by analysing the correlation between the independent variable, learning styles, and the dependent variable, tacit knowledge, while controlling for the effects of the covariate, learning strategies. ANCOVA allows for the prediction of a relationship between a categorical independent variable on an interval dependent variable while controlling for sources of variation caused by other interval level independent variables that also covary with the dependent variable.

ANCOVA also allows for the inclusion of more than one covariate. There are other interval level independent variables besides learning strategies that are also correlated to tacit knowledge. However, there are some conditions to be met by a variable to be a covariate. First, all the covariates must be correlated to the dependent variable. Second, there should be no multicollinearity between the covariates and Garson (2001a) suggested dropping new covariates that correlate more than 0.5 to earlier selected covariates. Third, the number of covariates should be kept to a minimum as the greater the number, the less will be the statistical power of ANCOVA.

**Table 9.27: Rotated Factor Matrix of learning styles and learning strategy items**

	1	2	3	4	5	6	7	8	9	10	11	12	13
LSI_22	0.67												
LSI_18	0.61												
LSI_20	0.59												
LSI_41	0.56												
LSI_7	0.55												
LSI_28	0.51												
LSI_29	0.51												
LSI_35	0.51												
LSI_24	0.51												
LS_5		0.71											
LS_7		0.69											
LS_8		0.67											
LS_6		0.65											
LS_3		0.55											
LS_4		0.54											
LSI_9			0.82										
LSI_6			0.77										
LSI_21			0.75										
LSI_39			0.70										
LSI_40			0.63										
LSI_10				0.63									
LSI_37				0.56									
LSI_4				0.54									
LSI_43				0.54									
LSI_36				0.54									
LSI_31					0.70								
LSI_46					0.62								
LSI_33					0.60								
LSI_1						0.64							
LSI_12						0.51							
LSI_8							0.56						
LSI_42							0.53						
LS_12								0.71					
LS_15								0.68					
LSI_15									0.74				
LSI_14									0.56				
LS_10										0.61			
LS_2											0.68		
LS_16												0.53	
LSI_27													0.53

Notes:

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 53 iterations.

LSI – Learning styles items

LS – Learning strategy items

The primary covariate controlled in the present study is learning strategy. Other covariates were chosen from the managerial tacit knowledge correlates presented earlier in Table 7.2 in Chapter 7. Of these, age, management experience and number of employees supervised were not found to be correlated with managerial tacit knowledge. Only service classification ( $r = 0.12$ ), job level ( $r = -0.14$ ) and level of education ( $r = 0.15$ ) were found to be significantly correlated ( $p < 0.05$ ) to managerial tacit knowledge in the present research. Since the three variables are not correlated to learning strategy and correlated at less than 0.7 to each other, they were all included as covariates.

One of the covariates, level of education, was later dropped from the model. This is because after running ANCOVA, the test of 'Between-Subject Effects' showed that a significant interaction existed between the independent variable, learning styles, and the covariate, level of education ( $F = 2.87$ ,  $df = 3$ ,  $p = .037$ ). This violates the ANCOVA assumption of homogeneity of regression coefficients. ANCOVA was finally run again with the covariates learning strategy, service classification and job level being controlled. The resultant ANCOVA test showed that the four adjusted means of 0.885 (Accommodator), 0.945 (Diverger), 0.905 (Assimilator) and 0.880 (Converger) indicated that there were statistically significant differences in LAMTK between the four Learning Styles, after controlling for learning strategy, service classification and job level ( $F = 4.01$ ,  $df = 3$ ,  $p = .008$ ). This finding confirms that learning styles contributes significantly towards the accumulation of managerial tacit

knowledge. It also confirms that the contribution of learning styles are independent of learning strategies, job service classification, and job level.

## 9.5 Conclusion

The two inventories used in the present study, the TKIM and the normative LSI, displayed several characteristics that demand special consideration for their use. First, the TKIM is based on a difference scoring system whereby each question in the inventory asks a subject's level of agreement to a given statement in relation to a particular incident/scenario. The 'right answer' was determined by comparing the response given to those responses made by 'experts'. Therefore, the resultant data produced by the inventory will be differences scores. Under such circumstances although the inventory was made up of three subcomponents (managing self, managing task and managing others) this will not be reflected in the scores produced. This is evidenced from the results of factor analysis performed earlier and the low  $\alpha$  values for the subcomponents shown in Table 9.3. Factor analysis on difference scores will group together groups of people with similar patterns of difference scores. Under such circumstances, the TKIM should not be analyzed along the three subcomponents. The TKIM should therefore be taken as a single measure of tacit knowledge.

For the LSI, the main issue is in choosing between using an ipsative as opposed to a normative scale format. Researchers pointed to the fact that ipsative measures suffered from imposed negative interdependence or multicollinearity (Cornwell & Dunlap, 1994). This came from the constant overall score for all subjects in an ipsative instrument that resulted in negative intercorrelations among the scores.



Therefore, because of its non-independent attribute and that it only produces categorical data between subjects, the psychometric properties of ipsative measures are different and should be used and interpreted differently than normatively scored instruments (Cornwell & Manfreda, 1994; Thompson et al., 1982). Cornwell & Manfreda (1994) showed the appropriate way of analyzing LSI's ipsative data. However, it involved a revamp of the standard scoring procedures of the LSI. Instead of adding up the respective scores for each of the four learning styles, they rank ordered the summed responses across the four styles producing twenty-four possible patterns of ipsative scoring which were then reduced to four categories based on a person's most preferred learning styles. Analysis procedures were then performed at the nominal level through multinomial approaches and logistic regression (Cornwell & Dunlap, 1994).

One point to note was that Kolb's Experiential Learning Theory (ELT) embodied in the LSI captured much more information than the merely categorical stylistic information. It also entailed information on an individual's learning modes which is best captured through normative measures. Therefore, taking into account criticisms against the learning styles construct as being weak (Bull and McCalla, 2002), the present research would strongly advocate for the use of normative measures as the way forward for ELT in order to benefit from higher level statistical analysis.

Data analysis performed on the observed data confirmed one of the major research propositions developed in this research, that learning styles do significantly contribute to the accumulation of managerial tacit knowledge. However, contrary to earlier expectations, learning strategies also contribute to managerial tacit knowledge.

Nevertheless, factor analysis suggests that each is unique in its relationship with managerial tacit knowledge. This finding is actually consistent with the Knowledge Acquisition Pathways model (Sternberg et al., 2000) discussed earlier in Chapter 3. Referring back to this model, procedural memory receives inputs from both personal experience and received knowledge. As Sternberg suggests, acquisition of knowledge from personal experience comes without the support of direct instruction and within the work organization context, which signifies the learning that took place on the job, in an unplanned way and an informal setting. Conversely, acquisition through received knowledge constitutes learning that occurs in formal settings through planned and deliberate programmes for example, training courses. This research therefore provides empirical support for the possibility that tacit knowledge, as a subset of procedural knowledge, and residing in procedural memory, is influenced by both formal and informal sources. The literature presented in Chapters 3 and 4 indicated that organizational resources and effort are often disproportionately directed towards formal environments, with insufficient attention being given to improving learning in informal, on the job settings.

Another major finding of these results is that the length of a person's general work experience has no bearing on the accumulation of managerial tacit knowledge. Ekpenyong (1999) also shed some light on this seemingly paradoxical finding by citing Wight's (1970) claim that experience needs to be acted upon to be learned. Whilst the role of experience in the acquisition of tacit knowledge remains undisputed, the present empirical finding lends support to arguments suggesting that what actually matters is not the length of experience but how people learn from their

experience (Colonia-Willner, 1998; Hedlund et al., 2001; Leithwood & Steinbach, 1995).

The consequence of these and other findings made in this chapter and their implications for management development practice will be discussed in more detail in the final chapter.

## CHAPTER 10

### CONCLUSION AND IMPLICATIONS

#### 10.1 A Brief Review of the Study

The thesis answered the objectives and research questions outlined in Chapter 1 by first exploring the management development initiatives in the Malaysian Public Service. It traced the broader reform movement in the entire public service aimed at modernizing and adjusting the public service role in the nation's socio-economic development and took a closer look at the Malaysian government's move to implement the Knowledge-Based Economy Masterplan, a blueprint for transforming the country into one of the elite group of industrialised countries. Inherent in the plan was the move to implement a competency-based human resource system for the public service. The system represented a new human resource and management development initiative in the Malaysian public service, in which competencies were viewed as the basis for development. It was argued that the competency-based human resource system illustrates the prevailing employee development philosophy in the Malaysian public service, which emphasises formal learning as opposed to informal learning approaches.

Literature on the formal and informal perspectives of Management Development and the related debate was then analysed in greater detail. Both perspectives were explained in terms of the modernist and post-modernist philosophical positions. Following this, the model of knowledge acquisition pathways developed by Sternberg et al. (2000) was adopted as a framework to analyse the relationship

between the two perspectives. This model, according to its authors, was intended to explain the nature of acquisition of tacit knowledge, a form of knowledge mostly associated with successful managers and experts. Approaching this model from the learning perspective, this thesis argued that individuals' pre-established cognitive patterns, which uniquely filter incoming information to those individuals, is responsible for the differences in the way they perceive, conceptualise, organise and process information. This thesis also argued that this condition is more prevalent in informal learning environments due to the unavailability of the support structures that exist in formal learning environments.

The thesis then proceeded to explore the nature and characteristics of tacit knowledge. The literature on tacit knowledge was considered in some depth, with an emphasis on studies conducted within professional settings. A pertinent question recurring in the literature on tacit knowledge in the professions is whether there is any difference in the way successful or expert managers learn from experience compared to others. This question arises from claims that experts and successful people tend to display higher levels of tacit knowledge compared to novices. This study, therefore, attempted to answer this question by investigating the reasons for the differences in the levels of tacit knowledge among individuals, especially between the more successful people and the others. Based on earlier arguments, the researcher proposed that unique attributes of an individual may account for these differences and that such consistent individual differences in preferred ways of organizing and processing information and experience are contained in the notion of styles.

In this study, tacit knowledge was perceived as a learning outcome. This view was taken in order to investigate its acquisition using Jonassen & Grabowski's (1993) range of individual differences that can impact on learning outcomes, such as intelligence, cognitive controls, cognitive styles, learning styles, personality, and prior knowledge. Further deliberations resulted in the proposition that the style construct or more precisely, learning styles could provide an explanation as to why some people learn the lessons from their experience differently from others.

Besides attempting to discover the relationship between learning styles and tacit knowledge, this study was also concerned with understanding the more general pattern of learning associated with the accumulation of managerial tacit knowledge. Also of interest were the role of experience within a managerial context and the relationship between learning abilities to the levels of managerial tacit knowledge.

In choosing the methodology to conduct the research, the researcher looked at the philosophical deliberations between the opposing cultures of inquiry. This resulted in the employment of mixed method techniques to conduct the research. Further deliberations on various mixed method options were also made, in order to inform the decision on the best available approach to answer each of the research questions. A two-fold strategy was then developed to answer the research questions developed: exploratory, using an in-depth interview, where the learning patterns associated with the acquisition of managerial tacit knowledge were investigated and confirmatory, using a questionnaire-based survey, where the relationships between the various variables hypothesized and levels of managerial tacit knowledge were established.

The research design, research instrumentation, and the procedures used were then explained.

In the qualitative phase, the study attempted to understand the general pattern of learning associated with the accumulation of managerial tacit knowledge. Using several categories of adult-learning principles which were argued to be more relevant to management development, data from interviews with fourteen public service managers were analysed. Among the adult learning theories applied were self-directed learning, reflective practice, transformational learning, action learning, and experiential learning.

The analysis of survey data in the quantitative phase of the study began with psychometric assessments of the measures used. This was done primarily because the three major components of the questionnaire used in the survey: the Tacit Knowledge Inventory for Managers (Sternberg et al., 2000), Geiger et al's (1993) normative version of Kolb's Learning Styles Inventory and Warr & Downing's (2000) Learning Strategies Questionnaire are relatively new and assessments of the instruments are relatively few. The seven hypotheses developed in Chapter 4 were then empirically tested using samples taken from the civil service in Malaysia.

## **10.2 Key Findings of the Research and their Implications**

### **10.2.1 The Role of Informal Learning in Management Development**

Secondary research, performed by reviewing the literature, led to the conclusion that the Malaysian public service had placed a high degree of reliance on what are termed

formal learning approaches as opposed to informal learning approaches, for the development of its employees. However, such reliance on formal learning approaches is contrary to more recent evidence showing that managers tend to learn more effectively in informal, on-the-job settings, rather than those settings evident in many formal education and development programmes.

There is also strong evidence that challenged the idea that explicitly extracted competencies, a construct popular within the formal perspective of Management Development, are the target every manager should aim for to improve their effectiveness. Such notions may have led to suggestions that competencies are no longer regarded as a sufficient criterion for success (Pedler et al., 2001). The researcher therefore suggested that successful managers acquire their abilities not simply through formal development and education delivered through such things as competency frameworks, but perhaps more effectively, through informal sources.

Much of the literature on management development has emphasized the importance of learning in informal settings and this is supported by the trend to adopt informal learning activities in many Western management development practices. On the other hand, within the field of work psychology, it has been widely accepted that tacit knowledge is closely associated with that of experts and successful people and that this knowledge is acquired from an individual's personalized experience. By reviewing a knowledge acquisition model (Sternberg et al., 2000), a link has been established in this thesis between learning from informal means and the acquisition of tacit knowledge.



These findings led the researcher to conclude that formal learning alone is insufficient for the development of managers and to argue for the inclusion of informal approaches to learning into the process of developing managers.

### *Implications*

The significance of these findings for management development is that so far, most management development efforts have been focused on formal learning. Despite arguments such as those of Tough (1979) that an overwhelming amount of learning in adults (approximately 70 percent) takes place outside institutional frameworks, a disproportionate amount of effort is being put into learning that occurs formally on the job. As formal learning can only account for a part of the tacit knowledge accumulated, there is a need for management developers to place greater focus on informal learning to complete the development of a manager with the necessary tools for knowledge acquisition.

The above findings also have important implications for management development initiatives in the Malaysian public service. Management development efforts undertaken by the Malaysian public service outlined throughout this thesis reveal a persistence in following formal learning approaches. This issue is important since Malaysia will continue to rely on its public service to overcome challenges facing the nation. Without an imminent change in the government's philosophy, the position of the Malaysian public service at the forefront of national development may not change much from the days when the nation gained its independence more than forty

years ago. Although under the National Development Policy the government proclaimed officially that the private sector was to take a leading role in the pursuit of economic growth, in actuality, the private sector in Malaysia was too weak to accept such responsibility.

With the prominent role shouldered by the public service, future management development initiatives in the public service must take corrective measures to take into consideration claims that most learning done by managers about managing does not come from organized learning providers and formal learning programmes (Mumford, 1997; Burgoyne & Hodgson, 1983; Cunningham & Dawes, 1997; Dawes et al., 1996). One way to achieve this is for management developers to redefine their relationship with respect to the trainees by assuming the role of facilitators as opposed to the role of learning providers (Hollinshead & Michailova, 2001). Policy makers in the Malaysian public service should also take note, as this would complement their move to encourage the state bureaucracy to be a facilitator rather than an active change agent in its pursuit of national development (Haque, 2001).

### **10.2.2 The Unplanned and Unintentional Nature of Managerial Tacit Knowledge Acquisition**

A key finding made in the qualitative phase of this study is that learning is not the explicit intention of managers. Most of the learning occurred unintentionally as a result of their main concern to solve work-related problems they were facing. This unplanned and unintentional learning pattern emerged after analysing the data using several adult learning principles. Prominent among these are the intuitive and the incidental approaches to learning from experience, several different forms of

reflection, and transformational learning. These forms of learning are categorised as being less conscious and deliberate than others such as self-directed learning, which were much less frequently displayed in the analysis of the interviews. This is not surprising, as the point has been raised previously by several authors in the West including Morris (1994) and Mumford (1995). It is also consistent with the characteristics of tacit knowledge discussed in Chapter 4. For example, Wagner describes tacit knowledge as something that “usually is not directly taught” (1993, p.19) and Baumard (1999) described how people acquired knowledge without being aware of it.

These findings also provide support to the secondary findings reported earlier, regarding the need to place equal emphasis on informal forms of learning. While the importance of tacit knowledge for managers is widely acknowledged, its acquisition has not yet been well researched. The present study, by showing that the acquisition of managerial tacit knowledge was ‘accidental’ in nature, supports the arguments put forth in favour of non-institutionalized forms of learning.

### *Implications*

There is a great need to understand the nature and mechanics of informal learning, in order to balance the extensive literature available on formalized learning. It is also important to identify the variables that mediate the acquisition of tacit knowledge. This calls for more efforts to structuralize the processes involved. Being unplanned and unintentional, the acquisition of tacit knowledge has been claimed to be inefficient and unreliable, depending to too great an extent on an individual’s capacity and capability. The present study provided considerable evidence of the use

of intuition by managers when faced with the need to solve problems. Intuition has been known to be a common trait of experts and this has much to do with their acquisition of tacit knowledge. The linkage between intuition and tacit knowledge may contribute towards the greater interest presently placed on understanding intuition in management (Hayes et al., 2004; Sadler-Smith and Shefy, 2004).

### **10.2.3 The Relationship between Experience and Tacit Knowledge**

It was the researcher's belief that investigating the relationship between the different ways people learn from their experiences, and variations in the level of their accumulated tacit knowledge would make a significant contribution to the field. Recognizing the importance of differences in the level of tacit knowledge to career success, the study focuses on identifying causes for these differences, leading to the overarching research question of the study, "What factors differentiate the way some individuals learn from experience compared with others?"

Findings made within the quantitative phase of the study revealed a significant difference in levels of accumulated managerial tacit knowledge (LAMTK) between the expert and novice groups, which is entirely consistent with previous research in the field (Patel et al., 1999; Williams, 1991) and, in part, confirms the validity of the present study. This finding might suggest that the length of a person's experience is related to LAMTK, since experts generally have more experience than novices.

However, the study revealed that LAMTK is unrelated to the length of a person's general work experience. This important finding lends support to the belief that it

may be how people learn from experience rather than the length of experience that matters (Hedlund et al., 2001).

### *Implications*

This finding could shed some light over the relationship between length of experience and tacit knowledge. The results of previous research on the relationship between the two are quite mixed, leading Sternberg and Grigorenko (2001a) to state that "...while tacit knowledge has some basis in experience, it is not perfectly correlated with experience" (p.11).

The present study argued that this may be due to imperfections in people's dealings with experience, resulting in some people failing to acquire certain knowledge that was successfully acquired by others. The reason why one individual might fail to acquire particular knowledge could be due to the limitations of the experience itself, and the fact that rarely do individuals go through entirely the same experience. However, where individuals do go through very similar experiences, the issue is then not that some individuals fail to acquire the knowledge, but rather that individuals learn from their experiences in different ways, leading to differences in the level and content of tacit knowledge. This is the areas where the present study hopes to make the most contribution, adding to what is currently a very limited understanding of tacit knowledge acquisition (Hedlund et al., 2001; Wagner & Sternberg, 1985; Sternberg et al., 1993; Sternberg & Wagner, 1993).

#### **10.2.4 Learning Styles and their Relationship to Managerial Tacit Knowledge**

The work of Wagner & Sternberg (1985) who developed instruments to measure the construct of tacit knowledge resulted in subsequent research leading to the major finding that significant variations exist in the level and content of tacit knowledge within equivalent groups. This thesis argued that a person's aptitude to learn might be a major factor accounting for these differences (Leithwood & Steinbach, 1995).

The above finding on the relationship between length of experience and LAMTK leads this study to claim that people tend to learn in different ways from their experiences. This may be due to their pre-established cognitive patterns acting as unique attributes of an individual. Such patterns may account for these differences and may contribute to the variations in tacit knowledge between different people. The present study has demonstrated, through the theory of experiential learning, that one such attribute is individuals' learning styles, which was found to be a significant factor accounting for the variations in LAMTK in this study.

##### *Matching Learning Styles to Professional Context*

Another particularly significant finding was one that is associated with Kolb's (1999) assertion that people with certain learning styles gravitate towards certain contexts and career types. For example, he suggested that the management profession is likely to be consonant with accommodating learning styles (Kolb, 1981) because people with this style tend to be more adept at dealing with people, exploiting opportunities and influencing others. The outcomes of the present study lend support to this assertion, because participants who performed predominantly managerial functions,

and whose dominant learning styles were accommodating, achieved significantly higher LAMTK than other subjects in the study. Whilst this is particularly noteworthy, it should perhaps come as no surprise when one considers that accommodators are likely to excel at learning tasks that lack structure; require a commitment to objectives; depend on seeking and exploiting opportunities; depend on the need to influence and lead others; require both personal involvement and skills for dealing with people (Jonassen & Grabowski, 1993). Kolb & Fry (1975) also found that in an experiential learning environment, accommodators value a lack of structure, and a high amount of peer interaction. These factors are closely associated with characteristics one would expect to identify in managers of human resources, particularly when compared with subjects whose learning styles are dialectically opposite to accommodators in Kolb's model (e.g. assimilators). According to Jonassen & Grabowski (1993) assimilators are more likely to excel at learning tasks that require careful organising of information; depend on the building of conceptual models; require testing of theories and ideas; benefit from the design of experiments and analyses of quantitative data. Subjects with a dominant preference for these types of tasks would be more adept at responding to learning situations that involve data processing, or computer programming for example, but not to learning situations that lack structure and demand the influencing and leading of others.

### *Robust Learners*

When responding to a particular learning situation, the learner is forced to select a mode of dealing with the incoming information. If the respondent's preferred learning style matches the learning situation, then it is expected that the learning experience will be more effective and efficient (Katz, 1990) and that learning

performance will be enhanced (Robey and Taggart, 1981). When responding to a variety of different learning situations encountered in experiential learning, however, one would expect that the possession of all four learning modes of Kolb's (1984) model would be critical for effective learning from experience (Kolb & Fry, 1975). Robust learners scoring highly on all four learning modes might be expected to respond more effectively to a variety of different learning situations than those scoring lower on all four modes. Because learning is believed to be the process whereby knowledge is created through the transformation of experience (Kolb, 1984, p38) one would therefore expect robust learners to have higher levels of LAMTK than other learners. The results from the present study also provided support for this hypothesis.

### *Implications*

The concept of learning styles has been mired in controversy and confusion (e.g. Reynolds, 1997). Following several attempts to position learning styles amongst other constructs (e.g. Sadler-Smith, 2001), this thesis offered the concept of learning styles as being more meaningful and appropriate if used in informal learning environments where the learner acquires knowledge on their own, without external "help". This was argued by showing that learning styles, despite applicable both in formal and informal learning environments, would be more prevalent in informal settings as people would tend to fall back to their preferred learning style in encountering uncertainty and unfamiliar circumstances. However, in formal settings where a student is guided by a teacher, mentor or peers, they may be more ready to adopt types of learning styles other than the preferred form. The present researcher believes that associating learning styles with informal means of learning and then



with tacit forms of knowledge may offer the concept a firmer theoretical foundation to counter claims that the concept is weak (Bull and McCalla, 2002) and lacking temporal stability (Loo, 1997). Curry's (1983) depiction of learning styles in the 'onion' model is very relevant to the propositions made in the present study. In this model, learning styles are placed further out than cognitive styles and as such are more amenable to external influence. This would then leave the construct available for 'developmental' purposes.

Following this, within the framework of the present research, managerial competencies necessary for performance effectiveness and efficiency falls into the explicit form of knowledge and can be disseminated to practising managers through formal learning mechanisms. Parallel to this, however, is the other form of knowledge required for a successful managerial career. Known as tacit knowledge, it has to be acquired by informal means "on-the-job". Moreover, with learning styles taken as a means of learning in informal settings, the present research undertook to show the relationship between these and tacit knowledge. Having established that relationship, the present research therefore would propose that management developers focus their attention to help managers prepare for knowledge acquisition equally in real-life settings, on-the-job within the context of their working environment and in traditional formal settings.

#### **10.2.5 Learning Strategies and their Relationship to Managerial Tacit Knowledge**

Learning strategy was introduced in the present study to act as a control variable in investigating the relationship between learning styles and managerial tacit knowledge.

This is because learning strategies, as opposed to learning styles, are believed to be more often associated with formal learning and declarative knowledge (Holman et al., 1997). Substantiating this is evidence from the organizational study perspective whereby learning is perceived as a strategy to achieve competitiveness.

However, a rather surprising finding of the study was that learning strategies, believed to be associated with declarative as opposed to tacit knowledge, were also related to the LAMTK. There are two possible explanations for this. The first is that the measure used for learning styles, the Learning Styles Inventory (LSI), and the measure used for learning strategies, the Learning Strategies Questionnaire (LSQ), may be tapping similar constructs. Whilst the LSQ taps learning strategies in mental, behavioural and self-regulatory strategies, the LSI is also believed to tap an element of learning strategies, with specific reference to particular styles of learning (Willcoxson & Prosser, 1996). It is possible; therefore, that the LSQ may measure a broader construct than the LSI, and that the LSI may represent a surrogate to that broader construct. This possibility was, however, ruled out after further analysis using factor analysis indicated that both are unique in their relationship to managerial tacit knowledge.

This points towards another possible explanation, that the acquisition of tacit knowledge may not be accumulated through informal learning alone but involves a mix of both informal and formal learning mechanisms. Taking the logic of this argument to the process of explicit knowledge acquisition, this may mean that both informal and formal learning were also involved in the process.

### *Implications*

The findings in the present study also exposed the intertwined nature of both tacit and explicit knowledge (Jyrämä and Äyväri, 2005). This raises aspects of Nonaka's model of knowledge creation involving the interaction between tacit and explicit knowledge. In that popular model, the creation of knowledge is built on the interchange between tacit and explicit forms of knowledge enacted through the sequential process of socialisation, externalisation, combination and internalisation in a form of a spiral (Nonaka and Takeuchi, 1995). Placing this model within the framework of learning environment at the individual level, it would mean that the process of knowledge acquisition would involve the interaction of explicit and tacit knowledge within the broader environmental context of formal and informal settings. The tacit knowledge itself is acquired through learning from experience in informal settings, coupled with what formal learning that person had also engaged with in the past.

#### **10.2.6 Contextual Influence on Managerial Tacit Knowledge**

It was mentioned above that previous research has shown significant variations to exist in the level and content of tacit knowledge within equivalent groups and this may be due to a person's aptitude to learn. Another reason for this may be due to variations in the way individuals pass through their experiences at different points in time and context (Wagner et al., 1999). The present study has demonstrated that the degree of match between job tasks and work context may also be significant factors accounting for these differences.

The nature of subjects' work experience was found to be particularly important in the present study because those who held managerial positions, but spent substantially less time performing management functions, were found to have accumulated significantly lower levels of LAMTK than those who spent the majority of their time performing management functions. This finding supports the view of Sternberg & Grigorenko (2001a) and Choo (1998) that tacit knowledge is likely to be context-dependent.

### *Implications*

The above findings would imply that within any profession, an individual's work environment will have a significant influence on levels of accumulated tacit knowledge, and these levels are likely to be moderated by the degree to which there is congruence between the job content and the work context. This finding confirms the context-dependent nature of tacit knowledge (Gottfredson, 2003) and implies that research on it should be done within specific contexts and professions. This would also have implications in practice, in that placing an individual in a managerial position, performing managerial tasks, would be essential to develop the person further in his or her career.

### **10.3 Future Research**

Several possible avenues for future research emerge from the present study. Understanding of the role of informal learning, especially the unplanned and unintentional in management development, is still in its infancy and requires more work. Although several models are available, the interaction between tacit and

explicit knowledge is not yet fully understood. Exploration of the mechanism through which the two intertwined forms of knowledge contribute towards each other will surely enhance the ability to develop managers to their full capacity.

A possible limitation of the study, however, is that subjects were managers based exclusively in the Malaysian Public Sector. Replications of the research are therefore required in a variety of contexts if the findings and implications are to be accepted with confidence and generalised to other populations. Future research can also undertake the task of understanding the acquisition of tacit knowledge in other professions besides management.

#### **10.4 Research Contribution**

The present research fills the gap within the field of work psychology where several researchers have been researching the role of tacit knowledge in the professions. Most of these researchers have focussed their attention towards the role of tacit knowledge in predicting performance (e.g. Argyris, 1999; Cimino, 1999; Forsythe et al., 1998; Herbig et al., 2001; Nestor-Baker & Hoy, 2001). They found that tacit knowledge is an important factor in predicting success and that experts and successful people have a higher level of tacit knowledge compared to others. However, no research has been done to answer the question posed by those such as Colonia-Willner (1998) and Reuber et al. (1990) as to why experts and successful people manage to acquire 'more' tacit knowledge than others. The present research was aimed at filling this gap by first exploring the adult learning patterns associated with the acquisition of managerial tacit knowledge and secondly, by adopting Kolb's

Experiential Learning Theory and investigating if learning styles, an individual difference construct, is related to the levels of acquired managerial tacit knowledge.

In terms of practice within the field of management development, the research has shown that the Malaysian Public Service's persistence with formal learning approaches alone for the development of its managers is not the right move to follow. This is evidenced from the qualitative study where it was found that most of the learning with respect to the acquisition of managerial tacit knowledge took place in a context that was less deliberate, unplanned, with a low degree of consciousness and took place while tackling work-related problems. The research concludes that formal learning approaches alone are insufficient for the development of managers and therefore greater recognition should be given to the contribution of informal learning as a significant and valid component in the overall learning process. Among the steps to be taken include the adoption of techniques such as coaching and mentoring that are currently widely practiced in the West besides changing public service management developers to assume the role of facilitators in learning as opposed to learning providers.

The research also contributed by performing psychometric assessments to the TKIM and the normative version of the LSI. The research showed that the TKIM produced differences scores and as such its properties are different than conventional scale scored instruments. This was shown to have an influence over statistical operations such as factor analysis and the determination of reliability estimates in its subcomponents. The research also argued for the use of normative scales as opposed to ipsative scales for the LSI.

### The New Economic Policy

Launched in 1970 immediately after the riot incident, it was set with a target of twenty years and was aimed to eradicate poverty regardless of race and remove the identification of economic activities with ethnic groups (Milne & Mauzy, 1986: 133) by engaging all of them in modern economic sectors in place of the traditional economy prevalent with the rural population.

To ensure the success of the NEP, the government realised that it would have to be directly involved and not let it take its own course through normal market mechanisms. This set the scene for strong intervention by the government in the nation's economy for the next two decades. The NEP was intended to redistribute not only wealth but also income through rural development, social spending, human capital and industrial restructuring<sup>1</sup>. Blaming the poor economic status of the Malays on their dependence on small-scaled agricultural sector<sup>2</sup>, the government sought to help them leave agriculture and ensure that those who stayed did not remain in poverty.

Besides tackling the predicament of existing farmers, the government also, through education opportunities, hoped to extract children of farmers from the agriculture

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<sup>1</sup> Despite its formal objective to attend to all groups regardless of ethnicity, it is obvious that the main target of NEP was the Malays (Jomo et.al., 1995). The essence of the NEP was to achieve what is termed as "social justice" for the Malays in which, taking advantage of their political dominance, they planned to improve the economic status of the Malays to the level of the ethnic Chinese (Esman, 1972). The justification for favouring the Malays was that in 1970, 52.4% of the population was classified as poor and Malays made up a staggering 60% of this figure (Hussain, 2000). Furthermore, corporate equity in 1969 was very unbalanced, with foreigners owning sixty percent, the Chinese thirty-seven percent and Malays two percent (Kuhonta, 2002).

<sup>2</sup> Malaysia's dependence on exports of rubber and tin left it vulnerable to fluctuations in the commodity market.

sector that had long been the only option for the majority of the Malays. Malays' employment prospects were improved by equipping them with greater skills and capacities. This was done by revamping the entire education system, thus ensuring the poor, handicapped Malays the opportunity not only to attend schools but also to enter tertiary education.

Industrial restructuring was another important objective of the NEP, to nurture more indigenous businessmen. Several agencies were specifically designed to achieve this by providing training for budding businessmen, credit facilities, affordable business premises, land, capital, and managerial and marketing services.

Redistributing income and wealth between ethnic groups is a sensitive issue. Despite the fact that most of the nation's wealth was held by foreigners through their business enterprises and the government made specific attempts to gain control of such companies through actions termed as "nationalism" (Snodgrass, 1998), it was widely perceived that the government's redistribution agenda was a deliberate attempt at taking wealth away from the Chinese. To avoid this perception, the government realised that it could only be done through high economic growth<sup>3</sup>. Through growth, the government hoped within twenty years to redistribute the economic pie according to the proportion of each ethnic group, where the Malays were to attain 30% of corporate equity; Chinese 40%; and foreigners 30%. To ensure that this would happen, the government believed it needed to intervene directly in the economy. Otherwise, it feared the growing pie would be consumed only by the Chinese populations as it was widely perceived that the Malays did not have the

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<sup>3</sup> Economists are divided as to whether Malaysia's redistribution policy boosted or impeded growth. However, elevating the economic capacity of the indigenous people may in the long run make ethnic heterogeneity an advantage for economic growth (Snodgrass, 1995).



capacity to compete for their portion on their own. Therefore, while the NEP was all about equity, a continuous stream of policies was also churned out by the government with the intention of stimulating economic growth<sup>4</sup>.

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<sup>4</sup> See Ahmad (et. al., 2001) for an overview of developmental policies aimed at economic growth.

### **Privatizing Public Enterprises**

Malaysia embraced privatization at a rather early stage in the 1980s after observing its implementation in developed nations (Malik, 1996). The nature of privatization at this time was, however, more experimental and was done on an adhoc basis. However it subsequently became a major component of the government's economic policy and pursued at a more rapid pace, resulting in the privatization of 210 public enterprises between 1983 and 1995 (Sarji, 1996b: 152).

Officially, the government hoped privatization could enhance the service quality of the privatized entities, reduce and control the size of the public service, reduce government financial burden, and accelerate national economic development through investment. However, privatization was also seen as a way to expedite the move towards the targeted Malay corporate equity ownership as outlined in the NEP (Malik, 1996).

Malaysia used five main methods to conduct its privatization exercise (Commonwealth Secretariat, 2004; McKinnon, 1996):

- Sale of government assets or equity in part or whole,
- Sale of government companies' equity in part or whole,
- A contract form of privatization in which private management expertise was engaged to manage government entities,
- Leased privatization, which involved the leasing of an asset to a private company,

- Build-Operate-Transfer (BOT) or Build-Own-Operate (BOO) systems that involved a period of concession where the private entity built the project operated it for a certain period of time before handing it over to the government.

The government's efforts began to bear fruit as an average of eight percent annual economic growth was registered for the period between mid-1980s and 1996<sup>5</sup> (Ahmad et. al., 2001). Malaysia's per capita income reached RM8,209 in 1999 compared to RM4,942 in 1990 and RM2,027 in 1970. Furthermore, the administrative and financial burden of the Government showed significant reduction, while the privatised entities displayed improvement in efficiency and productivity (Commonwealth Secretariat, 2004).

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<sup>5</sup> A growth rate of five percent or higher can, by convention, be taken as a high growth rate (Ghosh, 2003).

### **The Malaysia Incorporated Policy**

Modelled after the highly successful effort in Japan (Siddiquee, 2002), the Malaysia Inc. was officially launched in 1983 (Government of Malaysia, 2004). This policy went hand in hand with the privatization policy as the government attempted to find a way to reduce the association between ethnic groups and public/private sectors. By aggressively pursuing the privatization of public enterprises, Malay participation in the private sector could be increased.

While placing the responsibility for national development on the shoulders of both the public and private sectors, the Malaysia Incorporated policy was also an attempt to shift the public servants' mindset from their traditional paradigm to a new one that viewed Malaysia as a business entity owned both by the public and private sectors. The policy was based on the philosophy that cooperation between both sectors was crucial to ensure the success of the nation. It was therefore expected that a partnership would be forged between the two parties, where the private sector undertook the role of the engine of economic growth, while the public service took the responsibility to create a strong public management and administration that could act as a catalyst to the private sector's activities (OECD, 1998). In order to assume that role, the public service was expected to formulate strategies that would result in a customer-oriented public service.

### **Six Approaches to Elicit Tacit Knowledge**

Several methods have been used by tacit knowledge researchers in eliciting “non-expressed phenomena”.

#### **a) Sense Making Technique**

The sense making technique is an interview protocol that can be used “to encourage respondents to consider thoughts about their behaviour that may not be easily articulated but that the respondents employ to make sense of certain happenings” (Nestor-Baker & Hoy, 2001: pg. 94). It is claimed that the learning associated with tacit knowledge can be better accessed and probed using sense making (Cattell, 1971; Morgan, 1986), making the technique a useful qualitative method to elicit tacit knowledge. The sense making approach also permits a deep understanding of a person’s experiences (Parrott, 1996). Nestor-Baker & Hoy (2001) in their research to analyse tacit knowledge in school superintendents, utilized the sense making technique to elicit tacit knowledge.

The sense making technique was developed by Dervin (1983, 1992) and is focused on the study of

“human sense-making in situations where humans reached out for something they called information, used something they saw as a potential source and judged whether it helped or not, or created an idea about an institution based on experience with the institution” (Dervin, 1992: pg. 68).

The basic premise of this technique is that all people, as individuals, try to comprehend their world by making sense of reality, and the way they do this is

unique to each individual (Dervin, 2001). Dervin (1984 cited in Murphy et al., 1997) uses the term “time-space” to describe the point that each individual is located at a different location and time (time-space) and as such they construct a different sense of what was happening at that time-space.

The metaphor of the sense-making approach is of “the human travelling through a situation, facing gaps, building bridges, and making uses of outcomes” (Teekman, 2000: pg. 1128). During the journey, humans construct sense that allow them to move forward (Dervin, 1984 cited in Murphy et al., 1997). Similar situations experienced before allow the use of existing senses. However, the individual is bound to meet with gaps or discontinuities along the journey. Discontinuities exist intrapersonally and interpersonally and are part of everyday human existence (Dervin 1992). An example at the intrapersonal level is of discontinuity between what a person thinks and what he/she communicates, while an example at the interpersonal level is discontinuity between humans across cultures. Discontinuities or gaps stop a person in their tracks and require bridging through the constructing of new personal sense. This means that different situations call for different responses creating uniqueness and unpredictability among individuals. In short, individuals have to make their own sense of a situation by creating their own ideas, defining their own situations, and following their own paths (Dervin, 2001). The consequence of this constructivist view is that many other methods of predicting behaviours which are based on examination of behaviours from an external observer’s perspective are seen as flawed. Sense-making is claimed to solve this problem by providing predictive and explanatory power by looking at the universals of movement through time-space (Dervin, 1984 cited in Murphy et al., 1997).

For an “outsider” to understand an individual’s observations, he/she needs to approach it from the individual’s perspective. This can be done by helping the individual critically reflect on and analyse his/her experiences and actions (Stevenson, 1993 cited in Murphy et al., 1997). The role of the “outsider” researcher is such that he/she helps the “insider” to:

“... search in his[/her] own mind for the deeper levels of explanation that can help both persons ... Since the essential data are in the insider’s head, the process must be designed to bring out these data, which the insider takes for granted” (Schein, 1985: p.116).

The “outsider” (the interviewer) will then have access to the persons’ reality (McCracken, 1988) and understand the nature of reality from the observer’s perspective.

The sense-making technique exists as an alternative to the dichotomous research methodology between conventional quantitative empirical inquiry, which views knowledge as external and describes reality as measurable on a single, unidimensional scales (Dervin et al., 1982) and the qualitative inquiry, which is associated with being holistic, humanistic, relativistic, contextually-bound, and constructivist. Its creator claims that the sense-making technique rests on an analytic and quantitative concept and has the attributes of a qualitative inquiry. Although sense-making centres on the individual, this does not alienate it from the social perspective because even as the individual lives in a highly community-oriented environment, he/she still creates his/her own understanding of the world (Dervin, 2001).

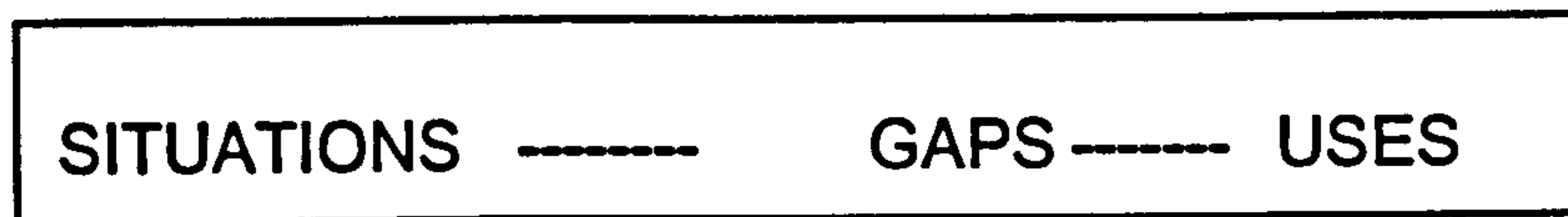


Figure D1: The Sense-Making Model.

Figure D1 illustrates the Sense-Making Model and its components are modelled as follows (Dervin, 1983):

- **SITUATIONS:** The time-space contexts at which sense is constructed.
- **GAPS:** The gaps seen as needing bridging.
- **USES:** The uses to which the individual puts newly created sense.

Sense-making utilizes several alternative means for interviewing respondents that can be summarized into four main techniques;

1. **Micro-Moment Time-Line Interview** - Claimed to be the core technique of the sense-making approach, it entails a step-by-step detailing of the sequence of events in a situation. Each step is called a time-line step and at each of this time-line, the interviewee is prompted for questions he/she might have and things he/she needs to learn, make sense of, or understand. The main idea is to help the respondents explore the self-selected situations in detail. While ensuring the respondents are firmly anchored to the context of the situation, the technique allows the capture of the individual's cognitive, emotional, and spiritual movement through that situation (Shields & Dervin, 1993).
2. **Helps/Hurts Chaining** - Helps/hurts chaining is utilized in sense-making to operationalize the usefulness of an event or information to a respondent in terms of how the event/information is seen as helping (facilitating) or hurting (blocking).
3. **Close-ended Sense-Making Interview** - This technique requires the respondent to focus on a real-life situation, after which he/she is asked to describe the situation and the reasons for choosing it. If the reason for choosing matches the criteria needed by the researcher, the respondent is then asked to rate on a scale of 1 to 7 the extent to which he/she sees the situation in specific ways, has specific questions, and needs specific help.



4. Message Q/ing Interview - This technique taps sense-making from the reading of printed messages. Respondents are told to stop as soon as they feel they have something they want to understand, make sense of, or learn. The stopping point is marked on the text and later, an in-depth analysis is done of each stop. The analysis will look at the connection of the stops to dimensions that is of interest to the researcher.

b) The Critical Incident Technique

Flanagan (1954) first introduced the critical incident technique and it utilizes incidents that occur in the workplace to identify behaviours that contribute to the success or failure of individuals or organizations in specific situations. The technique is used primarily to study practical problems in several professions (Angelides, 2001). McClelland (1976) adapted this technique to assess managerial competence. Wagner & Sternberg (1985) used the critical incident technique to elicit tacit knowledge in their study on managers and academic psychologists. Nestor-Baker & Hoy (2001) combined the critical incident technique with the sense-making method in their study on school superintendents.

An incident is an:

“observable human activity that is sufficiently complete in itself to permit inferences and predictions about the person performing the action” (Flanagan, 1954, p.335).

An important ingredient for an incident to be critical is that:

“. . . an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to leave little doubt concerning its effects” (ibid, p.327).

In other words, an incident is critical if it plays an important (critical) role in determining the outcome of a situation. Critical incidents place emphasis on phenomenon in natural settings and focused on practical problems. This technique tries to reduce personal opinions and pinpoints to facts, since behaviours repeatedly described by a large number of independent observers become a fact (Flanagan, 1954). Incidents are gathered to the extent of redundancy or until the researcher has obtained a satisfactory degree of saturation (Kemppainen, 2000).

However, the definition of “critical” seems to differ between authors, with Angelides (2001) for instance, insisting that a critical incident does not have to be a situation that is “dramatic” or obvious but it is sufficient if it is surprising or problematic enough to stimulate a period of reflection in a person (Schön, 1987, 1991). Tripp (1993) contended that:

“. . . the vast majority of critical incidents . . . are mostly straightforward accounts of very commonplace events that occur in routine professional practice which are critical in the rather different sense that they are indicative of underlying trends, motives and structures” (pp. 24-25).

Furthermore, he stressed that:

“... critical incidents are produced by the way we look at a situation: a critical incident is an interpretation of the significance of an event” (ibid, p.8).

This means critical incidents are not necessarily major events but can be minor incidents in everyday professional work, whose criticality depends on our own interpretation. This is in stark contrast to Flanagan’s view, which points to the importance of the situation/action in a critical incident to have significant

consequences, “a significant turning-point or change in the life of a person or an institution” (Tripp, 1993: p.24) or “highly charged moments and episodes that have enormous consequences for personal change and development” (Sikes et al., 1985: p.230).

Flanagan (1954) outlines five procedural stages in utilizing the critical incident technique.

Stage 1: Establishing the general aim of the activity

Stage 2: Setting plans and specifications, e.g. who should be the observers (i.e. respondents), which situations should be observed and which activities should be noted

Stage 3: Collecting the information — by direct observation retrospectively: by what means (e.g. interview); using only positive or both positive and negative incidents

Stage 4: Analysing the information — inductive classification, grouping of incidents into clusters, independent checking of categorization

Stage 5: Interpreting and reporting the findings

In the data collection phase (e.g. interview), the respondent is first asked for a recent example of effective or ineffective behaviour in dealing with the specified situation.

The researcher can follow the following sequence and attempt to get answers to the following questions (Andersson & Nilsson, 1964).

- Describe events/factors that led to the situation.
- What did the person do (or not do) that was effective or ineffective in handling the situation?
- What specific outcome occurred out of this action?
- Why was this action effective or what more effective action might have been expected?

Patterns or themes resulting from the responses to the above questions are sorted into dimensions for the specific incident. This represents the dimensions that are related to the behaviour being studied.

c) **Situational Judgment Tests**

The Situational Judgment Tests (SJT) consists of a series of job-related situations presented in written, verbal, or visual form. It is commonly used for assessing interpersonal and problem-solving ability and respondents' behavioural intentions (Motowidlo et al., 1990; Chan & Schmitt, 1997; Weekley & Jones, 1997). Situational judgment tests consist of contextual problems relevant to the domain of interest followed by a set of Likert-scale options for respondents to choose. Scoring on a SJT test is made by reference to professional rules of thumb or expert prototypes. SJTs have been used to measure tacit knowledge and predict performance of people in a variety of occupations (Sternberg & Grigorenko, 2001a).

Several variations to situational judgment tests exist. These include so-called paper-pencil management simulations (Motowidlo et al., 1990), situational interviews (Latham et al., 1980), and assessment centres (Thornton & Byham, 1982). A popular use of situational judgment tests is in personnel selection. Here, job applicants are presented with job-like situations similar to those arising in the job for which they applied and their behavioural intentions are assessed from their responses to the situations. It is presumed that their responses can be used to predict future job performance (Wernimont & Campbell, 1968).

However, the biggest problem with the use of SJTs is that it is unclear what construct the test actually measures (Ployhart, 1999). Most situational tests are not designed to measure a particular construct and much evidence indicates that SJTs measure constructs similar to those of cognitive ability tests (Campion et al., 1988).

d) Grammatical memorisation tasks

Reber (1967; 1989; 1993) dedicated most of his research to the study of unconscious or implicit learning and its resultant product, which is tacit knowledge. Most of the research was within linguistic competence and used grammatical memorisation tasks to elicit tacit knowledge (Reber, 1993). A typical experiment using grammatical memorisation tasks is as follows. First, the subjects are exposed to strings of letters; some of these letters are governed by orderly rules while the others are not. Then, subjects are presented with other sets of letters and they are required to determine which of the letters are orderly or “grammatical” and which are not. Reber (1967) found that subjects that are able to distinguish between the “grammatical” letters and the ones that are not tend to do so without knowing quite how they do it: evidencing that they have “unconsciously” learned a rule.

Atherton (2002), however, argues that this method of understanding tacit knowledge is limited in its applicability, especially in real-world settings. He identifies the methodology used as constraining in enabling the study of a more complex and coherent learning taking place unconsciously in the professions.

There are obvious differences in the study of tacit knowledge within language competence and within the professions. While tacit knowledge in the professions, as

related to experts, involves skill acquisition and is manifested in work performance, tacit knowledge in language is more associated with cognitive capacity, does not constitute a skill, and is defined in terms of mental states and structures that are not always manifested in behaviours or performances (Chomsky, 1980; 1986). Berry's (1997) experiments further demonstrate the demarcation between the two groups of research. She found out through studies that have been successfully replicated and extended that

“...practice significantly improved ability to control the tasks, but had no effect on ability to answer post-task, written questions. In contrast, verbal instructions given to subjects about the best way to control the tasks had no significant effect on control performance, although they did make people significantly better at answering the questions” (Berry, 1997: p2)

e) Mental scanning

Mental scanning (Reed et al., 1983), a cognitive architecture mechanism for the processing of all representations in the mind is another approach to study tacit knowledge. Most research involving mental scanning involves research on human memory.

f) E-mail sifting software

Finally, several computer programmes have been developed to capture tacit knowledge that flows in organizations. An example is that of software that sifts employee email with a view to establishing an organisational tacit knowledge 'database' based on keyword occurrences within messages (e.g. Lattig, 1999; Fridman, 1999).

### Method of Differentiating Between Predominantly Managerial and Non Managerial Context/Functions

The context of subjects' work environment was of interest in terms of whether or not their working time was spent predominantly performing managerial or non-managerial functions. This data was collected using a self-developed item within the demographic section of the survey instrument. Respondents were asked to list their current and previous job titles, to indicate whether or not these jobs were predominantly managerial in nature, and the period of time they performed each job.

The item, as it appeared in the survey instrument, is shown below:

*Qx. This research wishes to distinguish between management positions and non-management positions you hold currently, or have held in the past. It is important to distinguish for every position, which was predominantly managerial and which was predominantly non-managerial. As an example, you can consider your position to be that of management if your job involved managing organisational resources such as financial, human or materials.*

Current Job Title	Job Category (mark $\checkmark$ in the respective boxes)		Period in this position	
	Managerial	Non-managerial	Years	Months
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Previous Job Title	Managerial	Non-managerial	Period in this position	
			Years	Months
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This information was regarded to be a crucial component of the present research and particular attention was given to the accuracy of the data associated with this

question. It was made very clear to subjects in briefing sessions that this aspect of the survey was more concerned with managerial functions, rather than the titles of their positions. Subjects were strongly encouraged to approach the researcher if there was any doubt in their minds about this item. During the data analysis, account was taken of their current, and previous five job positions on the basis that tacit knowledge has a finite life-span (Argyris, 1999). The total number of years performing predominantly managerial functions was summated and compared with the number of years performing technical, or other non-managerial work. Whilst there may appear to be an element of subjectivity in these judgements, in most cases, there was a very clear distinction between the two contexts. Wherever there were doubts, subjects were interviewed to form an appropriate opinion.



### Criteria for identifying experts

Previous studies of tacit knowledge in the professions have identified expert/successful managers as those who are senior, highly successful and very experienced managers, often irrespective of the work context (e.g. Kerr, 1991; Klemp and McClelland, 1986; Wagner and Sternberg, 1987; Williams, 1991). However, evidence from the literature has shown that tacit knowledge is context-specific (Nonaka, 1994; Sternberg & Grigorenko, 2001a) and has a certain life span (Argyris, 1999). In other words, tacit knowledge which brought success to individuals within a given work context, may not be a suitable indicator of successful management in a different contexts or in a different timeframe. Nor is tacit knowledge necessarily dependent on the length of general work experience as previously argued.

The present study therefore builds on, and extends the selection criteria for expert/successful management used in previous studies. It does this by considering only those who stand out as being successful within the same work context as the subjects being studied (i.e. within the Malaysian Public Sector), and within a limited frame of time. Another major criteria is whether they had received a highly prestigious service excellence award for management in the past three years. Candidates in receipt of such an award undergo a rigorous selection process based on the following criteria:

- \* A candidate must be nominated by their superior as being an exemplary manager.
- \* A candidate must have received a score of greater than 90% for each of the last 3 years on their annual appraisal form designed to measure overall management success.
- \* Nominated candidates are rigorously assessed by a selection committee comprising senior staff in the organisation.

The number of awards never exceeds 5% of the population under the purview of each awarding committee. A service excellence award can be awarded to the same people each year provided the rigorous selection procedures are again met. Consequently, managers currently holding this award are deemed to be among the most successful in the organisation.

### Scoring the TKIM

Various scoring approaches for a tacit knowledge test have evolved and developed across several studies. The scoring method employed by Wagner (1987) has been recognised for its ability to allow for meaningful comparisons between groups (Sternberg et al., 1995).

However, before scoring began, subjects' ratings were first transformed after taking into account Wagner's (1987) observation that tacit knowledge scores generated by the prototype method are affected by individual differences in subjects' use of the entire scale. He argued that because scores are based on deviation from an expert profile, they would vary with the extent to which a subject used the entire rating scale. He suggested that the raw data on the tacit knowledge inventory be transformed by "standardizing the standard deviation of ratings across response items for subjects to the common value of 1.5" (p. 1241). Based on this, each and every entry was therefore transformed to a standardized standard deviation of 1.5 using the formula:

$$(((x_{ij} - x_i) / sd_i) \times 1.5)$$

where,  $i = 1 - 356$ ;  $j = 1 - 81$ ;  $x_i$  = mean across each subject's response items;

$sd_i$  = standard deviation across each subject's response items.

Menkes (2002) described the TKIM's scoring instruction in the following detail. First, test administrators are instructed to develop their own expert/successful group. The mean ratings for each item in the instrument are calculated for the successful group in order to form a expert/successful manager's profile<sup>6</sup>. Then, participant's scores on the TKIM are derived by subtracting their answer for each item from the expert/successful profile for that item. This generates difference scores between the participants and the expert/successful profile (Wagner and Sternberg, 1990) that can produce either positive or negative values.

Some previous authors (Colonia-Willner, 1998; Wagner, 1987) have chosen to square these difference scores to remove the polarity, whilst others have argued that squaring tends to inflate the value and this affects further calculations (Kerr, 1991). Citing Cronbach & Gleser (1953), Kerr (1991) argued for the use of absolute values for studies such as those that use expert-novice comparisons, and this approach has been adopted for the present study. The above transformations were performed using the formula;

$$dtk_{ij} = \text{ABS}(ztk_{ij} - xtk_j)$$

where,  $i = 1 - 319$ ;  $j = 1 - 81$ ;  $dtk$  = differentiated tk score;  $ztk$  = corrected TK ratings;  $xtk$  = expert's mean TK ratings.

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<sup>6</sup> The inter-expert agreement on the TKIM items was determined from the standard deviation of all the items for the 37 expert samples. It ranged from a low of 0.58 for item 62 and a high of 1.84 for item 15 in the present study. At this standard deviation rate, it can be assumed that inter-expert agreement existed for the TKIM items. This is consistent with other work such as Forsythe et al. (1998) on the Tacit Knowledge Inventory for Military Leadership. In that work, they concluded that there is an acceptable level of agreement among the experts in their study based on the standard deviation range of between 1 and 2 that they obtained.

Values for each of the work-related situations in the inventory are then summated in order to arrive at a score for each of the three contexts of managing self, managing task, and managing others. Summating the scores for each of these contexts yields a total score for tacit knowledge. The present study differed only slightly from Menkes (2002) recommended scoring system. Colonia-Willner's (1998) approach was adopted where the summated scores for each situation were divided by the number of items representing that situation, in order to provide an average value. Averaging was necessary to facilitate meaningful comparisons between the contexts since they were not made up of the same number of items.

### Scoring the Normative Learning Style Inventory

First, raw scores were added up to make each of the respective learning modes; Concrete Experience, Abstract Conceptualization, Active Experimentation, Reflective Observation. Concrete Experience was made up of items 6, 9, 14, 17, 18, 21, 23, 26, 39, 40, 41, 44. Abstract Conceptualization consisted of items 1, 3, 4, 10, 12, 16, 27, 34, 36, 37, 38, 43; Active Experimentation: Items 2, 5, 7, 8, 19, 20, 24, 28, 30, 32, 35, 42, and Reflective Observation of items 11, 13, 15, 22, 25, 29, 31, 33, 45, 46, 47, 48.

The AC-CE dimension was next obtained by subtracting the CE scores from the AC scores and the AE-RO dimension by subtracting the RO scores from the AE scores. The method of determining learning styles was similar to those used in the standard Kolb's LSI with Geiger's (1993) adaptation incorporated. This adaptation, a product of the scales used, resulted in the change in the axis intersection values of the CE-AC and AE-RO continuums. The mid-point or the intersection point between the two dimensions was obtained by observing the 50<sup>th</sup> percentile value on each of the dimension.

Finally, learning styles were determined as follows;

Accommodators	if AC-CE $\leq x$	& AE-RO $\geq y$
Divergers	if AC-CE $\leq x$	& AE-RO $< y$
Assimilators	if AC-CE $> x$	& AE-RO $< y$
Convergers	if AC-CE $> x$	& AE-RO $\geq y$

(let  $x = 50^{\text{th}}$  percentile of AC-CE dimension and  $y = 50^{\text{th}}$  percentile of AE-RO dimension)

This gives the dominant learning style for each subject with Accommodators labelled as 1 (emphasis on CE and AE), Divergers labelled 2 (emphasis on CE and RO), Assimilators labelled as 3 (emphasis on AC and RO) and Convergents labelled 4 (emphasis on CE and AE).

Correlation Matrix

	1	2	3	4	5	6	7	8	9	10
Age										
Yr Exp	.93**									
Number of Staff	.14*	.11								
Tacit Knowledge	-.04	-.06	-.01							
Concrete Experience	-.02	.00	-.11	-.04						
Abstract Conceptualization	.03	.04	-.11	-.19**	.55**					
Active Experimentation	.04	.06	-.09	-.24**	.60**	.71**				
Reflective Observation	-.05	-.01	-.15*	-.18**	.61**	.68**	.60**			
Mental Strategy	.20**	.18**	-.04	-.23**	.24**	.52**	.53**	.38**		
Behavioural Strategy	-.03	-.03	-.04	-.18**	.35**	.51**	.62**	.51**	.62**	
Self-efficacy Strategy	.04	.04	.00	-.09	.27**	.49**	.48**	.44**	.66**	.72**

Notes: \*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)



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