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Conceptions of learning identified by indigenous students entering a University preparation course

Alison M. Bunker
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CONCEPTIONS OF LEARNING IDENTIFIED BY INDIGENOUS
STUDENTS ENTERING A UNIVERSITY PREPARATION COURSE

By

Alison M. Bunker

A Thesis Submitted in Partial Fulfilment of the Requirements for the
Award of Master in Education

At the Faculty of Community Services, Education and Social Sciences,
Edith Cowan University, Mt. Lawley.

Date of submission: March 2000

ABSTRACT

The increase in Indigenous participation in university courses in recent years has not been matched by an increase in graduation. In the mainstream university population, student success has been linked to approaches to learning, which are linked to conceptions of learning. This study investigates what conceptions of learning Indigenous students identify at the beginning of their university career.

Thirty six students completed a 'Reflections on Learning Inventory' developed by Meyer (1995). Nine of these students were interviewed in depth about what they thought learning was and how they would go about it. The interview analysis for each of the nine students was compared with their individual inventory profile. It was anticipated that the use of such complementary methods would increase the validity of the findings, but this was not the case.

The participants identified a range of conceptions comparable with those identified by mainstream students, but with a greater emphasis on understanding. However, the descriptions of how learning happens were undeveloped and not likely to result in the kind of learning described.

The findings will be useful in making curricula decisions in an Indigenous university preparation course that encourage students to adopt successful strategies for learning. In addition, it will also be useful information for the participants themselves as they become reflective learners.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- (ii) contain any material previously published or written by another person except where due reference is made in the text; or
- (iii) contain any defamatory material.

Signature _____

Date March 2000

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This thesis is dedicated to the memory of my grandmother,
Mrs. Gladys M. Hyslop, L.L.A. (St. Andrew's University, 1930).

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CHAPTER ONE

INTRODUCTION

The numbers of Indigenous¹ people graduating from Australian universities is disappointingly low. Whilst there has been a marked increase in the numbers of Indigenous students entering access courses to higher education, this has not been matched by the retention and success rates for these students. There are many social pressures that complicate the issue and are beyond the control of educators. However, there is also a lack of research-based data describing Indigenous entrants to university upon which to base curricula decisions. A number of student characteristics are believed to affect the learning outcome. One such characteristic is what students think learning is. This study investigates what conceptions of learning Indigenous students identify at the beginning of their university career. This chapter sets the context for the research and presents the research questions.

Background To The Study

One strategy to increase the participation of Indigenous people in higher education has been the development of a one-year full time course to prepare the students for learning at university. Whilst the numbers of Indigenous people entering the course has increased over the last ten years, this increase has not been matched by an increase in graduates. One possible explanation is that students are not being prepared adequately for learning at university.

University learning is generally considered to involve more than learning essential background knowledge. For example, an Australian Senate Report (Aulich, 1990 in Ramsden, 1992) stated that university graduates should have “ a capacity to look at

¹ In this dissertation, the term ‘Indigenous’ is used to refer to people of Australian Aboriginal and Torres Strait Islander descent and to elements of their cultures.

problems from a number of different perspectives, to analyse, to gather evidence, to synthesise and to be flexible, creative thinkers” (p. 20). More recently, Entwistle (1997a) summarises this as the need for undergraduates to develop critical thinking skills. These skills require students to go beyond the words of the text to its meaning and to relate this meaning to a wider picture.

It is clear from the variation in student success at university that some students are better at university learning than others. Studies in student learning suggest the difference between successful and unsuccessful students is not that successful students do more learning, but that they approach it in a different way.

How students approach their learning is affected by a range of factors, including their intention when they are learning (Entwistle, 1997a). This intention arises from how the learning task appears to them (Biggs & Moore, 1993; Marton & Säljö, 1984; Marton, Watkins, & Tang, 1997). Thus a student who believes learning is about accumulating information would set out to learn information in order to repeat or use it later. They would probably make extensive use of memorisation and rehearsal strategies. On the other hand, a student who believes that learning is about making meaning would try to understand the ideas. They would be more likely to use strategies that involve manipulating and relating the learning material. In university, it is this second, deeper approach that is linked to quality of understanding (Biggs & Moore, 1993).

Students’ beliefs about the nature of learning are referred to as conceptions of learning. Since students’ conceptions of learning are believed to affect how they perceive and approach the learning task and hence student success, it would be helpful if lecturers had knowledge of the different conceptions their students have.

There is a growing body of literature reporting on students’ conceptions of learning in higher education. There is also some data from a study by Purdie (1994) about the conceptions of learning held by Australian students in the last two years of high

school. In addition, there are a number of studies with students from non-western cultures where culturally specific conceptions have been found (e.g., Purdie, 1994; Watkins & Akande, 1994; Watkins & Regmi, 1992). To date, however, the research into Indigenous university students' conceptions of learning is limited to a study of first year Indigenous students in degree courses (Wilss, Boulton-Lewis, Marton, & Lewis, 1999) and its pilot study of second year students in an Indigenous health degree (Boulton-Lewis, Marton, & Lewis, 1997). There is no data on the conceptions of learning with which Indigenous students enter university, nor of Australian students in general. Nor is there data on the conceptions of learning held by students from ethnic minorities in other countries. Lacking specific data, lecturers teaching Indigenous students can only make inferences from other studies, which may or may not be appropriate.

Research involving Indigenous people as subjects is often conducted from an anthropological perspective. There is a growing criticism amongst Indigenous researchers of these studies because they frame aspects of Indigenous culture as traditional and fixed, and do not take into account the diversity of contemporary Indigenous experiences. Furthermore, such research is often comparative and results in a polarisation of 'differences' with the construction of Indigenous people as an homogenous group deficient in some way. For example, Nichols, Crowley and Watt (1998) noted that the inequitable educational outcomes for Indigenous students have often been explained by assuming that Indigenous people have a particular learning style that makes them deficient in certain skills, abilities, and attitudes considered necessary for academic success.

Research that is more constructive explores the diversity of Indigenous students and has as its focus what is the case, rather than what is not the case. This can lead to positive programmes that value, develop, and extend existing knowledge. By investigating Indigenous student learning from a perspective that emphasises individually constructed conceptions, the differences and similarities within the

group can be explored and used to inform the design of courses for Indigenous students.

Purpose Of The Study

This study is exploratory in nature. It seeks to develop a picture of the beliefs Indigenous people have about learning, and how they anticipate they will go about learning when they enter a one-year full time university preparation course.

Differences and similarities within the group are explored.

A second aspect of this study compares two different methods for investigating what conceptions of learning students identify. The usual method for exploring students' conceptions of learning is through time-consuming semi-structured interviews. These interviews, which can take up to an hour, are taped. The taped data are then transcribed and the transcripts are analysed using lengthy, iterative processes which can take days if not weeks. An inventory, on the other hand, can be completed in ten minutes and analysed quantitatively in hours. An inventory is not only much more efficient, but allows for larger numbers of students to be investigated. The Reflections on Learning Inventory (RoLI) has been developed by Meyer (Meyer, 1995; Meyer & Boulton-Lewis, 1997a; Meyer & Boulton-Lewis, 1997b) to investigate students' beliefs about learning. This study collected data through both interviews and the RoLI. A comparison of the conceptions of learning identified by the same students in both situations provides a validity check on the inventory.

Significance Of The Study

This study is timely. The number of Indigenous students participating in higher education has increased in response to government policies over the last ten years, but this increase has not been matched by an increase in graduates. A number of reasons for this have been put forward that suggest a need to revisit the curriculum

and make a better match between the curriculum and Indigenous students (Bourke, Burden, & Moore, 1996; Christensen & Lilley, 1997; Ham, 1996).

In the mainstream literature, it is reasonably assumed that if teachers have knowledge of their learners' conceptions of learning, then learning should improve (Marton & Säljö, 1997). Knowledge about what Indigenous students believe learning is and how they believe it is best done can inform the design of courses for these students and increase the quality of learning. This study is an exploration of those beliefs.

Improvements to curriculum are a necessary, but not sufficient means of addressing the inequitable educational outcomes of Indigenous people. As Nicholls et al. (1998) note, for Indigenous people as a group, "homelessness, powerlessness, poverty and paternalism account for under-achievement of Indigenous students [more] than any explanation based on differences in 'learning styles'" (p. 45). Nevertheless, informed improvement to the curriculum is still required.

The second aspect of this study investigates the validity of the RoLI with Indigenous students entering university. If analysis of the RoLI data produces similar conceptions of learning as those elicited from analysis of semi-structured interviews with Indigenous people entering university, then the instrument would appear to have validity. Consequently, the RoLI would become a useful and efficient tool for collecting data about the conceptions of learning.

Research Questions

The principal question is:

What conceptions of learning are identified by Indigenous students entering a university preparation course?

Subsidiary questions are:

What do they think learning is?

What do they anticipate that they will do in order to learn?

Do all Indigenous students see learning in a similar way?

The second question relates to the validity of a new instrument to collect data on students' conceptions of learning:

Does analysis of the RoLI data produce similar conceptions of learning as those elicited from analysis of semi-structured interviews with Indigenous students entering university?

Chapter Summary

It is timely to consider factors that affect the success and retention of Indigenous students at university. In the mainstream student population, conceptions of learning have been linked with approaches to study that have been shown to affect learning outcomes. There is little data on Indigenous students' conceptions of learning. This study will explore conceptions of learning identified by Indigenous students entering a one year university preparation course. The findings of this study will provide useful information about Indigenous students that can be used to inform the design and development of curricula for Indigenous students entering university preparation courses.

CHAPTER TWO

THEORETICAL FRAMEWORK AND PHILOSOPHICAL ASSUMPTIONS

Introduction

This study is concerned with students' conceptions of learning. There is a growing body of research about students' conceptions of learning that has its origins in a particular research perspective called 'phenomenography'. This chapter critically explores the underpinning theory and philosophical assumptions of phenomenography.

The Origins Of Phenomenography

The starting point for this study is an area of research that focuses on students' experiences of learning. The research, subsequently called phenomenography, originated in Sweden in the 1970s with Ference Marton and his colleagues, Roger Säljö and Lennart Svenson. Their position was a reaction to the current empirically unverifiable cognitive theories about student learning (Entwistle, 1997b). Marton and his colleagues were interested in exploring the qualitative variation in student learning. They developed a qualitative research approach to investigate what students actually do when they learn. In particular, they investigated the functional relationship between what students do when they learn and their subsequent understanding. For example, Säljö (1979, in Marton, Dall'Alba, & Beaty, 1993), asked students to read a piece of text and be prepared to answer questions about it. He then asked the students what the author's main message was and how they had gone about the task. The findings described qualitatively different ways in which students understood texts. These were later associated with qualitatively different ways of approaching the task.

'Phenomenography' literally means description of phenomena. Svenssen (1997) usefully describes phenomenography as a specialisation comprised of an orientation and an approach. As an orientation, phenomenography aims to describe the 'conceptions', more recently called 'ways of experiencing'², that people have of phenomena together with the variation in these conceptions (Marton & Booth, 1997). As an approach, phenomenography involves accessing and categorising how people view reality, that is, their conceptions. The dominant method for collecting data is through a loosely structured, conversational interview (Entwistle, 1997b; Prosser & Trigwell, 1999). The orientation and approach together become the phenomenographic specialisation. This research specialisation developed by Marton and his colleagues has been widely used in studying teaching and learning in higher education (Marton et al., 1993).

Philosophical Assumptions

Certain philosophical assumptions that underlie the phenomenographic orientation, and hence this study, need examining. The concern for the individual and the desire to understand why people act in one way rather than another locates phenomenography within the interpretivist paradigm. Phenomenography clearly has similarities with ethnography, as Säljö (n.d., in Entwistle, 1997b) explains:

Phenomenographic research started out as an attempt to scrutinise and understand human learning by focusing on what people are in fact doing in situated practices and when studying. (p.128)

Underlying the approach is the belief that individuals create their own reality from their experiences. As Marton and Booth (1997) explain, people can have different

² This change in nomenclature appears to reflect difficulties in translating the original Swedish word *uppfattning* (Säljö, 1997).

ways of understanding the same phenomenon because they experience the phenomenon “through their different biographies” (p. 36). In other words, an individual’s reality, or ‘how things are’, is affected by past experiences, beliefs, values, and attitudes. However, rather than being an explanatory investigation of people’s different biographies, phenomenography is an attempt to describe the variation in people’s ways of experiencing things.

A further assumption underlying the interpretivist perspective shared by the phenomenographers is that meaning is context dependent. Jacob (1992) has described the interpretivist perspective as one that includes:

attention to the meanings that humans create and use to guide their behaviour, [and] a recognition that in any situation meanings can vary and create multiple realities. (p. 295)

Different meanings or understandings occur because situations are experienced differently. Consequently, multiple meanings can be held in response to a variety of perceived contexts. Marton and Booth (1997) believe that what people do reflects their conception or how they experience something. A crucial assumption in phenomenography is that if two students experience a problem in exactly the same way, they will deal with it in exactly the same way and get the same result.

Therefore, when two students get different results, they must have dealt with the problem differently, and they dealt with it differently because they experienced it differently. Consequently, as Marton and Booth explain, to understand why people act in a certain way, it is necessary to understand how they experience the situation.

Phenomenography has as its focus of study the variation in ‘conceptions’, or ‘ways of experiencing’ that people have. According to Marton and Booth (1997), ‘conceptions’, and ‘ways of experiencing’ are synonymous. They are simply experiences and not psychological (cognitive) constructs such as concepts and schemas. As experiences, they “comprise an internal relation between subject and

world” (p. 123). The phenomenographers prefer to talk about experiences so that the mental world does not become separated from the real world. Embedded in this is an ontological assumption about the nature of reality: there is only an experienced world. This is the only world we can talk about and learn about. Prosser and Trigwell (1999) refer to phenomenography as a form of constitutionalism. They believe that “meaning is constituted through an internal relationship between the individual and the world” (p. 12). That is, the world and the individual do not exist separately but are constituted together. People have different conceptions because they pay simultaneous attention to different aspects of the phenomenon. More advanced conceptions pay attention to more parts simultaneously.

According to Svenssen (1997) various assumptions about the nature of knowledge and of thinking are embedded in the phenomenographic ‘conception’. Firstly, knowledge is created by human thinking and activity. Secondly, knowledge is related to and dependent upon the reality external to the individual. In other words, knowledge is neither ‘out there’ in the positivistic sense, nor is it entirely internal and subjective. Rather, knowledge and conceptions, which constitute knowledge, are “relational [and] created through thinking about external reality” (p. 165). A third epistemological assumption is that because individuals create knowledge, knowledge as meaning varies. It is this variation in meaning that is the subject of phenomenography.

However, according to the phenomenographers, there is a limit to the variation. This assumption is implicit in the belief that categories of description can be formed (Svenssen, 1997). This is because conceptions are constructed within limiting socio-cultural ways of understanding things and not entirely subjectively constructed entities. Different conceptions reflect a focus on different aspects of the phenomenon or on more aspects simultaneously. The limited total variation is called the outcome space. A category of description is a thinking tool for the researcher to describe the conception. If the conception is the experience, the category is the description of the

experience. Because the different categories/conceptions reflect differences in the parts of the phenomenon that are simultaneously discerned, they are logically related and hierarchical (Marton & Booth, 1997).

To summarise the philosophical assumptions underpinning phenomenography:

1. Individuals act rationally and purposefully.
2. The only world that can be talked about is an experienced world.
3. 'Ways of experiencing' things is synonymous with 'conceptions of', 'ways of conceptualising', and 'ways of understanding'.
4. Conceptions are an internal relationship between the individual and some aspect of the world.
5. Knowledge is subjective and relational.
6. Knowledge is made of conceptions.
7. There is a limited number of ways in which phenomena can be conceptualised.

Other Interpretations Of 'Conception'

Although Marton maintains that conceptions are not separate psychological constructs, and in publications since 1997, (e.g., Marton & Booth, 1997; Marton et al., 1997), he stresses that 'conceptions of' is a synonym for 'ways of experiencing', they have previously often been described as if they are psychological entities. For example, Marton (1988) discusses conceptions *and* experiences of learning, but adds that because experience is always of something and conceptualisation is always of something, we "do not have to make a distinction between experience and conceptualisation" (p. 67). Again in 1993, Marton et al. describe the aim of phenomenography as "to reveal the qualitatively different ways in which people experience *and* conceptualise various phenomena" [author's italics] (p. 278).

While Marton is clarifying the nature of conception in his own recent literature, there is a lag in the associated literature. For example, Prosser and Trigwell (1999) describe conceptions as “ways of conceiving of something” (p. 4), Meyer (1998) refers to “students’ beliefs about learning” (p. 54), Entwistle (1997a) refers to students’ conceptions of learning as “how students see learning” (p. 17), and Ramsden (1992) refers to conceptions as “understandings” (p. 28) and as “experiences, perceptions or conceptions of something” (p. 45).

This recent shift in emphasis by Marton may be important, because one of the main methods for collecting phenomenographic data is to ask people to talk about how they experience things. For example, if students are asked “what do you actually mean by learning?” as Säljö (1979, in van Rossum & Schenk, 1984), did, clearly they are being asked to describe a mental construct. This may or may not coincide with how they actually experience things. Alternatively, they may not even describe how they think they experience things, choosing instead to talk about how they think they ought to experience.

It could be argued that the closer the interview is to the experience, the more likely the description of the experience would match the experience. However, data collection by researchers about students’ conceptions of learning has not always been conducted close to the learning experience. Methods of data collection are described in the next chapter under the section, ‘A Cautionary Note’. Säljö (1997) notes that phenomenography started as a way of describing what people do, but now describes what people say they do. Säljö is critical of the recent shift by Marton from conceptions *and* ways of experiencing to conceptions *or* ways of experiencing. He argues that it is an assumption that “utterances from individuals made in specific situations with varying motives” (p. 177) are “indicative of ways of experiencing”, but none-the-less, suggests that the ‘accounting practices’ that people use are legitimate objects of study reflecting socio-cultural influences. This is discussed in more depth in the section on methodology.

Conceptions Of Learning

Before reviewing the conceptions of learning literature, it is necessary to consider the nature of conceptions and in particular conceptions of learning. It is obvious that learning involves learning something: there is both the action of learning and the material that is learned. Marton and colleagues (e.g. Marton & Booth, 1997) refer to these as the 'how' and 'what' aspects of learning. Because learning is an action, the conception of learning is concerned with the how aspect. Marton and Booth (1997) refer to what is learned as the direct object, and what learning is as the indirect object. The how aspect, therefore, also has 'what' and 'how' aspects, that is, what learning is and how learning is done. Figure 1 shows this diagrammatically.

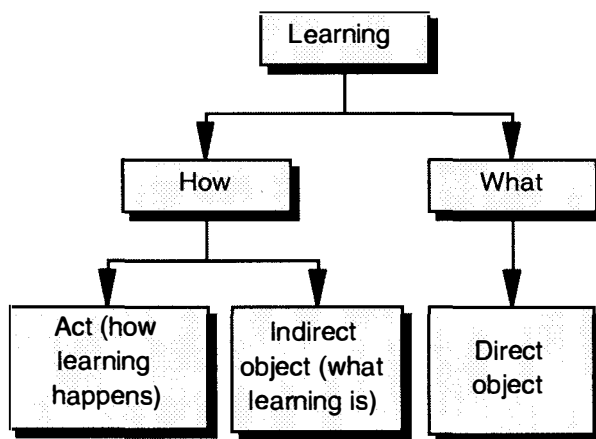


Figure 1. Learning has a direct object, an indirect object and an action (adapted from Marton & Booth, 1997, p. 85)

According to Marton, each aspect of a conception, or way of experiencing, has a meaning, or referential aspect, and a structural aspect. The structural aspect refers to the way something is recognised by observing its constituent parts, the internal horizon, and its relationship to the background or context, the external horizon. Meaning and structure are inextricably intertwined. One has to have some idea of what something is in order to recognise it as an example of that something, and in order to see something as having a particular meaning, one would need to be able to identify its parts and relationship to context. Marton uses the example of a deer in the

woods at night: you can only see the deer if you know what a deer is. With reference to learning, if to learn something means to commit a meaning to memory, then the structural aspect involves focusing beyond the words to the meaning. On the other hand, if learning means learning the words, then the structural aspect involves a focus on the words and not the meaning. All aspects are present in both situations, but the experience is different in each situation because different aspects of the phenomenon are focused on. Clearly what is actually learnt (the direct object) is different because 'learning' has been conceptualised/experienced differently.

Different conceptions therefore represent differential attention to the structural parts of a phenomenon. If learning is gaining knowledge about the world (Marton & Booth, 1997), then, from a phenomenographic perspective, learning is

about experiencing the object of study in a different way, where the experience is a relationship between the person experiencing and the object experienced. (Prosser & Trigwell, 1999, p. 12)

An educationally desirable conception is one that involves simultaneous attention to many or all the discernible aspects (Marton & Booth, 1997). Learning should be about meaning, about seeing the environment with a higher degree of meaningfulness or understanding (Dahlgren, 1997). From a phenomenographic perspective, then, learning is seen as a shift towards a conception that takes into account more aspects of the phenomenon and necessarily, these are more complex aspects. Thus, a sophisticated conception of learning focuses on not only discerning the internal parts in the phenomenon, but on understanding how these are related structurally and also how the phenomenon is related to its contexts.

Chapter Summary

Phenomenography aims to describe the different ways people experience the world through accessing and categorising their experiences of phenomena. These

experiences are referred to as conceptions or ways of experiencing. 'Learning' is a phenomenon that has been explored in this way. According to the phenomenographers, a conception can be described in terms of what it is and how it is experienced. Further, the 'what' and 'how' can each be described in terms of a referential aspect and a structural aspect that refer to the meaning and how it is recognised respectively. Therefore the conception of learning can be explored in terms of 'what learning is' and 'how learning happens'.

CHAPTER THREE

REVIEW OF THE LITERATURE

This chapter is in two sections. The first section reviews the literature concerning conceptions of learning. The seminal work in the area is reviewed first, followed by a consideration of subsequent research which suggests that conceptions are developmental and subject to contextual effects. The findings of research conducted in non-western cultures are then discussed. Most of the conceptions identified in phenomenographic studies have a focus on knowledge, but some are more person-oriented. These are considered in the next two sub-sections under the headings 'motivational conceptions' and 'conceptions with holistic tendencies'. The penultimate sub-section relates the findings in the literature to the understanding developed in the previous chapter of what constitutes a 'conception'. Finally, some points raised by researchers urging caution in using the results of phenomenographic studies are considered.

The second section reviews the literature on Indigenous learning. Most of the existing research into Indigenous learning focuses on traditional Indigenous epistemology and pedagogy and how these impact on learning style. The research in this area is reviewed briefly. The usefulness of applying the findings of such research to contemporary Indigenous Australians is questioned. Finally, findings from recent investigations of Indigenous undergraduate students' conceptions of learning are described.

Conceptions Of Learning

A number of studies have been conducted to investigate students' conceptions of learning. Most of these studies are based on the work of Marton and his colleagues (e.g., Svensson, Säljö), which commenced in the late 1970's at the University of

Gothenburg, Sweden, and take these findings as a reference point in mapping out the terrain.

The variation in students' conceptions of learning was first explored by Säljö in 1979 (van Rossum & Schenk, 1984). He asked students the question "What do you actually mean by learning?" and classified their answers into five distinct categories:

1. The increase in knowledge.
2. Memorising.
3. Acquisition of facts, procedures etc. which can be retained and/or utilised in practice.
4. Abstraction of meaning.
5. An interpretive process aimed at the understanding of reality.

Since then, these conceptions have been identified by a number of other researchers, (e.g., van Rossum and Schenk, 1984, Giorgi, 1986, and Marton and Ramsden, 1987, in Marton et al., 1993).

In a development of the work by Säljö (1979, in Marton et al., 1993), Marton et al. (1993) interviewed students in a Social Science degree at the Open University. They asked the students the same question as Säljö. The students were interviewed seven times over the six years of the course. From the data, Marton et al. (1993) identified a generalised theme of learning that appeared to be common to all the conceptions: *Learning as an increase in knowledge*. Marton's team explored what was specifically meant by learning and knowledge. They were able to identify the five categories previously described by Säljö (1979) as well as a new, sixth, category, *learning is changing as a person*. In addition, they extended the definition of each category by describing the referential and structural aspects of each conception (i.e., what 'learning' means and its constituent parts and relationships between these). The six categories are briefly described in Table 1.

Table 1. Conceptions Of Learning Identified By Marton et al. (1993).

A	<i>Increasing one's knowledge.</i>	Learning is the accumulation of discrete and factual knowledge. Students with this conception approach learning with the intention of absorbing information. Learning is knowing more than one did before in a strictly quantitative sense. This conception is distinguished from the overarching conception with the same description by its 'how' aspect. Students learn by taking in and storing factual knowledge.
B	<i>Memorising and reproducing.</i>	Students with this conception relate learning strongly to the study situation. Thus, learning is remembering information and being able to repeat it when necessary.
C	<i>Applying.</i>	Learning is the ability to apply knowledge or a procedure. It differs from conception B in that learning is not replicated, but applied in the real world.
D	<i>Understanding.</i>	In this conception, learning involves understanding something in order to make sense of it. This may involve looking into something to see how it fits to make a whole. Alternatively, this may involve looking out from something to see how it fits with other ideas in a holistic sense.
E	<i>Seeing something in a different way.</i>	After learning about something, students with this conception expect how they think about something to be changed. This may be because they have new knowledge about it, or because they have learnt and applied the skill of how to see things in different ways.
F	<i>Changing as a person.</i>	According to Marton et al., this conception is a development of conception E, because things are now seen differently, the learner becomes changed as a person. The meaning of things cannot be learned without the learner being affected by this. There is a sense of empowerment, referred to as 'agency' by Marton et al. (p. 293).

Marton et al. (1993) describe a definite discontinuity between the first three conceptions and the remaining three. Conceptions A, B and C are concerned with a quantitative view of learning. From this perspective, learning is seen as acquiring discrete facts. Learning results in knowing more facts, and more detailed facts. This view of knowledge is the stuff of quiz shows where being knowledgeable about Mozart might mean, for example, knowing where he was when he wrote a particular piece of music. On the other hand, conceptions D, E and F represent a qualitative view of learning concerned with meaning-making. Students with these conceptions seek a deep understanding of phenomena through identifying and exploring the relationships within and between phenomena. Knowledge is regarded as connected: being knowledgeable means understanding how things fit together. Thus, being knowledgeable about Mozart would mean understanding the various themes and motifs in his work, and perhaps being able to compose something similar but original, which other people may recognise as having a connection with Mozart's music. Meyer (1998) describes these two different views of learning as accumulative and transformational:

in simple terms, information is either collected in a quantitative sense for possible future use, or internally rearranged as part of a process of constructing knowledge, developing personal meaning and thereby changing as a person. (p. 54)

According to this definition, only one of the conceptions described by Marton et al. (1993) is transformational (*Learning is changing as a person*). For the purpose of this study the two different views of learning are referred to as accumulative and meaning-making, to emphasise the different focus in the two sets of conceptions.

Marton et al. (1993) found that students sometimes expressed more than one conception in the same interview. In addition, since the study was longitudinal and conducted over six years, they were able to identify a developmental trend through

the conceptions from the accumulative to the meaning-oriented, transformational conceptions. They argued that logically these conceptions could be arranged into a hierarchy with subsequent conceptions in the hierarchy developing from and integrating previous conceptions. For example, it is only after students have learnt to see things differently or developed the skill of seeing things differently (conception E) that they can see the world in such a way that they change as a person (conception F). This hierarchy has not been empirically demonstrated (Purdie, Hattie, & Douglas, 1996), although there are a number of studies where students have identified multiple conceptions (for example, Cliff, 1998; Pramling, 1983; Purdie, 1994; and Steketee, 1996), and studies where their hierarchical nature has been assumed (Pramling, 1983; Steketee, 1996; and Watkins & Akande, 1994).

Marton et al. (1993) note that the conception *learning is changing as a person* occurred in only a few cases. It is an interesting conception, because it is the only one in which the learning experience is connected with personal affective dimensions. Hazel, Conrad and Martin (1997) note that the study by Marton et al. (1993) was unusual in two respects. Most of the subjects were mature aged women, and two of the three principal researchers were women. Hazel et al. (1997) are critical of typical phenomenographic studies, firstly, for their failure to identify gender as an important dimension; secondly, their focus on disciplines dominated by male students; and thirdly for ignoring the affective dimension of learning. They suggest that this holistic conception reflects women's ways of learning and was identified because of the number of women in the sample and the involvement of female researchers. This connectedness is crucial to women's ways of knowing and has been largely ignored in phenomenographic studies of learning.

In their study of 16-18 year olds in Japan and Australia, Purdie et al. (1996) found another conception *learning as a process not bounded by time or context* reflected the "notion of learning through a variety of life experiences" (p. 94). It was identified by approximately four percent of the students in the sample. In this conception,

learning was not limited to the study situation and was a continuous process. This conception is identified by the emphasis placed on the external horizon, which is where and when learning takes place. The sample for this study contained approximately equal numbers of males and females so it is possible that the 'connected' nature of this conception may have reflected the significant proportion of girls in the sample compared with previous studies.

In a more recent study, Marton et al. (1997) identified four different ways Chinese high school students experienced learning, each representing an increase in depth.

Learning was seen as:

- (i) committing words to memory.
- (ii) committing meaning to memory.
- (iii) understanding meaning.
- (iv) understanding phenomena.

They suggested that the conceptions *committing words to memory* and *committing meaning to memory* correspond to conception B: *learning is memorising and reproducing* described by Marton et al. (1993), and that the conceptions *understanding meaning* and *understanding phenomena* correspond to conception D: *learning is understanding* described by Marton et al. (1993).

In addition to this further analysis of 'understanding', Marton et al. (1997) propose a reinterpretation of the earlier classification by Marton et al. (1993). They suggest that the six conceptions identified by Marton et al. in 1993 can be categorised in relation to the three different temporal stages of learning: acquiring new knowledge, being in a state of having that knowledge, and being able to apply the knowledge. Thus, the conceptions *learning is memorising and reproducing* (B) and *learning is understanding* (D) represent the acquiring stage, *learning is increasing one's knowledge* (A) and *learning is changing as a person* (F) represent the knowing

phase, and conceptions *learning is applying* (C) and *learning is seeing things in a different way* (E) represent the application phase. Conceptions A and C are considered to be generic and not specific statements about the experiences of 'knowing' and 'making use of' respectively. Conceptions F and E refer to the 'knowing' and 'making use of' aspects of conceptions deeper than those identified in the 1997 study by Marton et al.

According to the literature (e.g., Boulton-Lewis, 1994; Cliff, 1998; Marton et al., 1993; Taylor, 1994a; Watkins & Akande, 1994), the conceptions of learning most frequently identified by students are the accumulative conceptions corresponding to the conceptions *learning is an increase in knowledge*, *learning is memorising and understanding* and *learning is applying* identified by Marton et al. (1993). In the literature this is linked to the educational context of high schools and universities, which have a strong focus on the transmission and reproduction of knowledge (e.g., Mugler & Landbeck, 1997; Taylor, 1994b).

The Development Of Conceptions Of Learning

Much of the work on conceptions of learning has been conducted with students in higher education. This section reviews the literature on conceptions of learning identified by primary and secondary school children.

Pramling (1983) interviewed 300 children aged from four to eight years old and identified an overarching conception of learning *learning is to become (more) able by experience*. In addition, she identified three conceptions of learning that appeared to be developmentally linked. The first conception, *learning to do*, was found in most children aged four years old and older. Learning was experienced as doing, such as learning to ride a bike or learning to count. There was no metacognitive awareness of learning, only an awareness of doing. There is a subtle but important difference here between 'doing is learning' and 'learning by doing'. Whilst the children had no

awareness of learning as separate from doing, they were aware, it seems, that "one learns to do something through experience" (Pramling, 1988 p. 276).

The second conception, *learning to know about the world*, was seen in about a quarter of the eight year olds and not often in younger children. In this conception, learning was seen as gaining factual knowledge that could be retold to some one else, for example, learning that elephants live in the jungle. The child learns the knowledge by being told it or by finding it in a book. The experience of learning is one of perceiving things. According to Pramling, at this level children are aware of being able to learn more things and of becoming more able as they become older.

In the third conception, *learning to understand*, learning was experienced as thinking: "learning is seen as a change in way of thinking about reality" (Pramling, 1988 p. 268). This conception was found in a few of the eight year-olds. The children with this conception were aware of their thoughts and were active in seeking comprehension. For them, learning happened through personal experience and thinking. Like Marton et al. (1993) Pramling (1983) found multiple conceptions and noted that previous conceptions did not disappear and she assumed they were arranged as an hierarchy.

Pramling (1983) extended the understanding of conceptions of learning by clearly identifying two related aspects: what the children learn and how the learning comes about. She notes that the 'how' aspect of each conception is associated with a conception of knowledge. Thus, if having knowledge means being able to do something, then practising and applying is how it is usually learnt; if having knowledge means knowing basic facts, then these are usually learnt by memorising and reproduction; and finally, if having knowledge is about knowing the meaning of things, then understanding through personal activity is necessary.

Pramling (1983), unlike Marton et al. (1993), refers to the 'what' and the 'how' aspects of learning as separate conceptions. Referring to the 'how' aspect, she

describes the *experience of learning* as having three forms: doing, perceiving, and thinking that correspond to the three conceptions: to do, to know, and to understand (Pramling, 1983). This suggests that in her work she believes that the conceptions and the experience are different but related. It seems that she considers the 'what' of learning to be a mental construct and how learning happens as an experience. If this is so, this differs from the later explanation by Marton et al. (1993) of the relationship between the 'what' and 'how'.

In a study of Australian primary school children aged 5, 8 and 11, Steketee (1996) found similar conceptions of learning to Pramling. In addition, she identified a primordial³ conception: *learning is to learn* that preceded *learning to do* and was held by the youngest students in her study. For students with this conception, learning happened as a consequence of "attending school, listening to the teacher and behaving" (p. 54).

Steketee (1996) categorised the conceptions in terms of their orientation. For the youngest children, learning had a social orientation: they went to school to learn because society requires it of them. The next conception, identified by slightly older children, had the action orientation described by Pramling (1983): learning was becoming [more] able. In this conception learning was very dependent on the teacher, but there was also a deliberate act by the learner to be involved and to practise. The eight-year-olds tended to have a knowledge orientation and the eleven-year-olds tended to have a meaning orientation. Steketee (1996) found a noticeable affective dimension in this last orientation: a feeling of personal satisfaction when understanding has been gained. Like Pramling (1983), Steketee (1996) found that the

³ Steketee (1996) refers to this conception as 'generic' due to its "vague, ill-defined nature" (p.53). The 'how' aspect focuses on the pre-conditions of learning. In this conception there is no evidence of any mental learning processes. The author has labelled it primordial rather than generic as it seems more like a first, primitive conception than a general overarching one.

students had an awareness of more than one conception and also assumed they were hierarchically arranged.

These two studies of conceptions of learning are important because they consider the conceptions of learning held by young learners and identify early forms of the first conception, *learning as an increase in knowledge* identified by Marton et al. (1993). Furthermore, both provide some support for there being a developmental aspect to the conceptions of learning hierarchy.

High school students' conceptions of learning have been investigated by Purdie et al. (1996) in Australia. They asked students aged 16 - 18 years to write down what they meant by learning, what they meant when they said they had learned something and to answer a series of questions about learning strategies in various situations. The researchers found the students most frequently identified learning as *memorising and reproducing knowledge*, and then *understanding and increasing knowledge*, with less than five per cent identifying a deep conception. These findings are similar to the original findings of Marton et al. (1993) in their study of university students.

A study by Lonka, Joram and Bryson (1996) investigated what students think learning is. The results emphasised the developmental aspect of conceptions of learning. Lonka et al. looked at conceptions of learning and strategies for learning identified by lay people, 'novices' in educational psychology, and 'experts'. Lonka and colleagues asked students to write a subjective definition of learning. This was followed by the question "What do you think would be the best way to enhance students' ability to learn?" This problem required them to apply their knowledge of learning. The researchers found that the lay people focused on learning as the absorption of information, the novice students focused on learning as acquiring knowledge into an existing framework and the experts saw learning as a process of reorganising and constructing new knowledge.

The variation noted by Lonka et al. (1996) towards more complex conceptions of learning with increased knowledge and experience in learning is reflected in the variation found in other learners. For example, in a cross sectional and longitudinal study, Busato, Prins, Elshout, and Hamaker (1998) found that students' 'learning style' became more meaning directed with increasing experience as a learner. This tendency is also supported by evidence from Fuller (1999) who found that students in the first year of a teaching course, many of whom came straight from school, were more oriented towards a reproductive view of learning than students in a training course who were, on average, 18 years older and had entered from the workforce.

In a survey of the literature on mature students' approaches to study, Richardson (Richardson, 1994b) concludes that mature students are more likely to adopt a meaning orientation. Harper and Kember (cited in Richardson, 1994b) suggest three reasons for this. Firstly, mature students are more motivated by intrinsic goals, secondly, the impact of secondary education is more remote, and, thirdly, prior life experiences promote a deeper understanding that "appears to be facilitated by the planning and decision making that is part and parcel of adult living" (Biggs, 1995, in Richardson, 1994b).

The Effect Of Context On Conceptions Of Learning

Work by Van Rossum, Deijkers and Hamers (cited in Cliff, 1998) suggests that the acquisition of a learning conception has a developmental aspect and "can be influenced by academic and other contextual factors " (p. 206). In the Western context, such contextual factors include the discipline being studied. Watkins and Regmi (1992) found that some conceptions of learning were reported more often with particular discipline areas. For example, students studying science subjects were more likely to express an accumulative view, whereas students studying English had a more meaning-oriented view. This finding is supported by Eklund-Myrskog (1998) who investigated conceptions of learning held by students of car mechanics and

nursing. She found that “the differences among students’ conceptions of learning within the programs were ... smaller than the differences in conceptions among students participating in different programs” (p. 312). She concluded, “the qualitatively different ways in which learning is experienced can be assumed to be contextually dependent” (p. 312).

Conceptions Of Learning Found In Other Cultures

In terms of this study, one the most important factors to consider in relation to conceptions of learning is the contextual effects of different cultures. The six categories identified by Marton et al. (1993) and discussed above were identified in groups of Swedish students (Säljö, 1979 in Marton et al., 1993) and English students (Marton et al., 1993). Purdie (1994) found similar conceptions in Australian secondary school students. Outside the European context, in a study of Nigerian secondary school students Watkins and Akande (1994) found four categories similar to the first four identified by Marton et al.

In a study with university students representing many diverse cultures of the South Pacific, Mugler and Landbeck (1997) found that students used the word ‘learning’ in two senses: (i) taking in information or broadening knowledge, and (ii) ‘real’ learning, which results from and in understanding. Similarities can be drawn between these and the conceptions identified by Marton et al. (1993). *Taking in information or broadening knowledge* is similar to the superordinate conception, *learning is an increase in knowledge*. *‘Real’ learning, which results from and in understanding* seems similar to the meaning-oriented conceptions: *learning is understanding* (D), *learning is seeing something in a different way* (E) and *learning is changing as a person* (F).

A few studies with Chinese students support a developmental perspective to conceptions of learning. Meyer (1995) found that students from oriental educational

backgrounds studying in an English university identified a range of conceptions that “appear interrelated and linked to deep-level processes in some sense that unified both an accumulative and transformational emphasis” (p. 550). He suggests that as acquiring knowledge is common to all the conceptions of learning, perhaps the accumulative and transformational aspects are not independent. The findings from a study of Hong Kong secondary school students by Watkins (1996) support this view. Watkins found four stages in how learning was experienced. Each stage had an intention matched with an associated strategy. The transition through the stages appeared to be dependent on the increasing complexity of the material to be learned. Students initially sought to reproduce what was taught, then to reproduce the important things, then to understand in order to reproduce, and finally to understand and memorise through that understanding. Whilst this may appear to be developmental, Watkins suggests the particular strategies and intentions may reflect Chinese pedagogy and the nature of the instruction in the Hong Kong context.

In their study of Australian and Japanese 16-18 year old school students, Purdie et al. (1996) identified six conceptions similar to those previously identified by Marton et al. (1993). However, there were significant differences in the frequency with which the conceptions were identified by the two groups of students that suggested cultural effects. Whereas the Australian students most frequently identified learning as memorising and reproducing, the Japanese students were more likely to identify learning as increasing knowledge and personal fulfilment.

Motivational Conceptions

Purdie et al. (1996) found two other conceptions of learning identified by Japanese students. They found seven per cent (n= 215) of the Japanese students identified *learning as a duty*, that is, learning was a responsibility or obligation both to oneself and to other people. Purdie et al. suggested this might be related to the Japanese emphasis on duty and responsibility to one’s teachers and parents. The conception

learning as developing social competence was identified as a minor category and almost exclusively by the Japanese students. Students with this conception focused on learning communication, social and interpersonal skills in order to be a good citizen. Purdie et al. suggest this reflected the cultural beliefs that intelligence is reflected in social competence. These conceptions seem to reflect a motivational aspect of learning and unfortunately, Purdie et al. (1996) do not describe how students with these conceptions explain what learning is or how learning happens.

In fact, the category *learning as a duty* falls outside of the classification by Marton et al. (1993), which describes the conceptions in terms of 'what learning is' and 'how it happens', but not in terms of 'why' learning should happen. Yet when students talk about learning they often refer to why it is important or worthwhile. For example, in a South African study, Cliff (1998) identified a conception that explained why learning should happen: *learning is a moral obligation to God (or some authority figure or a community)*. And similarly, in another South African study, Meyer (1997) found the conception *learning is empowerment* that does not fit within the classification by Marton et al. (1993). Like the conceptions *learning as duty* and *learning as a moral obligation*, this conception is motivational and reflects why learning is desirable and worthwhile.

Conceptions With Holistic Tendencies

In a study of Nepalese higher education students, Watkins and Regmi (1992) found the conception *learning implying personal change* was not linked with evidence that the change was dependent on a higher order conception of learning as it was in the study by Marton et al. (1993). Watkins and Regmi (1992) suggest this conception represents an ethical/moral dimension to learning that reflects Hindu beliefs linking education to the whole person and not just the mind. They argue that this explains the occurrence of the conception at a lower cognitive level than in Western countries. In a follow up study, Dahlin and Regmi (1997) looked specifically at the meaning of

'personal change' for Nepalese students and identified three different conceptions: *a change in behaviour*, *a change in understanding*, and *a change in both behaviour and understanding*. Studies in languages other than English, such as these by Watkins and Regmi (1992) and Dahlin and Regmi (1997), emphasise the need for clarification of meaning when collecting data. For example, change as a result of learning can happen at a number of levels. At the simplest level, if a student has more information they are changed in the sense that they know more. At another level, a person does things differently because they have learnt to do them differently (this corresponds to *learning as applying*). At a deeper level, when they understand things they see things differently and are therefore changed (this corresponds to the conception *learning is seeing something in a different way*). And at the deepest level, a deep personal change comes about when understanding affects the person in a way that necessitates a different way of behaving (this corresponds to what Marton et al. (1993) call 'agency' in the conception *learning is changing as a person*).

In the same study, Watkins and Regmi (1992) found other 'themes', which occurred in conceptions identified by ten per cent of the students independently of an accumulative or meaning-oriented view of learning. Of interest here is the theme *much real learning occurs outside school*. This is similar to the conception *learning as a process not bounded by time or context* identified by Purdie (1994) and appears similar, but in a stronger form, to the life world described by Marton et al. (1993) as the 'external horizon' for conceptions A: *applying knowledge*, C: *learning is increasing knowledge*, D: *understanding*, E: *seeing something in a different way* and F: *changing as a person*.

In summary, the studies of conceptions of learning in other cultures indicate that students identify a range of conceptions increasing in complexity and depth. The research evidence suggests that the six conceptions of learning identified by Säljö and Marton can be recognised in other cultures, but in addition, there are often local variations within the conceptions and, sometimes, specific cultural conceptions.

It seems that culture does not determine the content of the learning conception in any absolute sense. However, the learning-context does seem to influence which aspects are accentuated and which are left in the background. (Eklund-Myrskog, 1998, p. 300.)

Moreover, these cross-cultural studies seem to highlight aspects of learning different from those foregrounded in the seminal work by Marton et al. (1993). These aspects include motivational aspects of the learning experience, epistemological aspects, and dimensions of depth in 'personal change' and in 'understanding'.

The Relationship Between The 'What' And 'How' Of Learning

As discussed in the previous chapter, it is Marton and Booth's (1997) contention that a person's conception (experience or understanding) of learning links what learning is with how it happens. From the learner's perspective, Marton maintains "the way of seeing one of the components is not independent of the way the other component is seen" (Marton et al., 1993, p. 296). Implied in this relationship is a functional link: where learning is experienced as being able to reproduce facts for a test, then learning involves memorising and reproducing; where learning is understood as being able to do something better than before, learning is achieved through practice; and where learning is conceptualised as being able to see things differently, then learning means deliberately making an effort to look at things differently.

It is worth noting that in many of these studies the 'how' aspect of the conception is treated separately or is not reported on. In the study by Purdie (1994), the answers to the 'what' and 'how' questions were analysed separately and no relationship was found between students self reported strategies and their conceptions of learning. Cliff (1998) asked the students what learning was and how they knew it had occurred, but did not ask how learning happens. Similarly, the studies by Meyer (1997) and Watkins and Regmi (1992) do not describe the 'how' aspect of the conceptions they identified.

Unfortunately when only the 'what' of learning is described in the categories of learning conceptions, there is a gap in the empirical evidence to support Marton's model of a conception. Moreover, there is some evidence that conceptions of learning and strategies are not so closely linked. In a recent study, Fuller (1999) found little evidence to support the relationship between students' conceptions of learning and the use of strategies. In a pilot study by Boulton-Lewis et al. (1997) into Indigenous students' conceptions of learning, the two students who identified meaning-oriented conceptions of learning both described strategies that relied on transmission and reproduction of information in common with the rest of the students. Similarly, Wilss et al. (1999) found that half the Indigenous students in their study identified conceptions of learning which did not match the strategies they reported using.

Lonka et al. (1996) found that only the experts in their study applied their knowledge of learning to the problem in ways that were consistent with their conception of learning. In a second study reported in the same article, they found that whilst students could be trained to change their espoused definition of learning, this was not reflected in their solutions to the problem. This study is significant because the 'what' and 'how' aspects of learning do not appear to be connected, and yet according to phenomenographic theory, they must be as they are different aspects of the same thing. It highlights some of Säljö's (1997) concerns that what students say they do may not be what they do. This is discussed further in the section on methodology.

A Cautionary Note

In the literature on conceptions of learning there are a number of voices urging caution in using the results of phenomenographic studies. Taylor (1994b) found little connection between the written comments of students and their views expressed in an interview. He suggests that questionnaires and interviews are only vignettes and if we focus on the vignette we may not access the larger context within which the

vignette makes sense. He warns against the use of conceptions of learning to make judgements about students' views on learning unless considerable effort is invested in eliciting those views *in situ*. Richardson (1994a) also points out that phenomenographic studies ignore the essentially social nature of the interview and Eklund-Myrskog (1998) questions the value of reducing utterances to isolated statements out of context.

Given the desirability of eliciting views on learning *in situ*, it is interesting to note that in the majority of the phenomenographic studies reviewed in this chapter, the data were collected in interviews where general questions about learning were asked (Dahlin & Regmi, 1997; Marton et al., 1993; Mugler & Landbeck, 1997; Pramling, 1983; Steketee, 1996; Watkins & Regmi, 1992; and Wilss et al., 1999). Only in a few studies were students specifically asked to refer to a recent learning experience in the interview (Marton et al., 1997; van Rossum & Schenk, 1984; Watkins, 1996; and Watkins & Regmi, 1995). In none of the studies were data collected *in situ*. The findings from these studies need to be treated with caution as they may have reduced validity. Similarly, given the need to clarify and elaborate with participants about their conceptions of learning, findings from students' written answers to questions need to be treated with even more caution as there has been no elaboration (e.g., Purdie, 1994; Taylor, 1996; van Rossum, Deijkers, & Hamer, 1985; van Rossum & Schenk, 1984; and Watkins & Akande, 1994).

Summary Of Literature On Conceptions Of Learning.

The following points summarise the research findings into conceptions of learning.

1. The six conceptions identified by Marton et al. (1993) have consistently been found in the research data. They can be grouped into accumulative (A, B and C) and meaning-oriented conceptions (D, E and F). The accumulative conceptions are essentially quantitative whilst the meaning-oriented conceptions involve a

qualitative change in knowledge. In addition, conceptions B and D focus on the acquisition of knowledge, conceptions C and E focus on the application of knowledge, and conceptions A and F are about knowing. Students can hold multiple conceptions, and which conception is dominant depends on the interpretation of the context by the student.

2. The conceptions appear to be developmental with deeper conceptions linked to increasing experience or age. They also appear to be hierarchical in that each new conception extends and includes previous conceptions.
3. The research suggests that different cultural contexts accentuate different aspects of the conceptions. The deeper conceptions seem to be evident across cultures and suggest some universality in learning in higher education, whilst the accumulative conceptions of learning seem subject to local cultural influences, most notably values and language.
4. The accumulative conceptions occur most frequently in all the studies and this has been linked theoretically with an emphasis on the transmission and reproduction of knowledge in educational institutions.
5. Whilst the main distinction between the accumulative and meaning-oriented conceptions is a focus on meaning, meaning and understanding themselves have quantitative and qualitative depth dimensions. Meaning and understanding are not absent from the accumulative conceptions of learning, rather what distinguishes the conceptions is whether the student is attempting to understand the text or the meaning to which the text refers.
6. Conceptions of learning which indicate a motivational component have been identified with Japanese students, South African students and hinted at with Indigenous Australian students.

The different conceptions identified in the literature review are listed in Table 2 for comparison.

Indigenous Learning

The emergence of different conceptions of learning in different cultures cannot be ignored and reflects the link between culture and learning. This section considers how culture and learning are connected in the literature on Indigenous learning. Most of the existing research in Indigenous learning focuses on traditional epistemology and pedagogy and how these impact on learning style. The usefulness of applying the findings of such research to contemporary Indigenous Australians is questioned. Finally, findings from two recent investigations of Indigenous undergraduate students' conceptions of learning are described.

Traditional Indigenous Knowledge

Because this study seeks to explore conceptions of learning within a specific cultural group, it is necessary to explore some of the belief systems and practices of that group that may impinge on learning. Culture has been defined as a shared system of standards for believing, perceiving, evaluating and acting (Goodenough, 1971, in Malin, 1998). This shared system of beliefs and values results in a culturally specific 'world-view' that affects how the world is seen and how people think, feel and act in their environment (Christie, 1987, in Partington & McCudden, 1992). Fundamental philosophies about the nature of reality, knowledge, and humanness are transmitted as part of the worldview through enculturation processes such as child rearing practices, story telling, rituals, ceremonies, and the rules and mores of the society.

Table 2. Conceptions Of Learning Identified In The Literature Review Grouped According To Similarities.

Conception of learning	Examples	Reference
Superordinate	Learning is an increase in knowledge. A "prior and superordinate" conception of learning. Taking in and broadening knowledge.	Marton et al. (1993) Mugler & Landbeck (1997) South Pacific islanders
Primordial	Learning is to learn. Vague (generic) primordial, learning explained in terms of purpose; focus on preconditions for learning, no awareness for any mental processes.	Steketee (1996). 5 - 8 year olds.
Doing	Learning by doing. Learning a consequence of being involved in doing. Learning to do. Learning to do is indistinguishable from doing.	Steketee (1996). 5 - 8 year olds Pramling (1983).
Knowing more	Learning to know the world. The child learns knowledge of facts or circumstances as a product of someone else's efforts, these facts can be told to someone else. Increasing one's knowledge. Learning is knowing more than you did before in a strictly quantitative sense. Dependence on other sources, eg: teachers, books. Knowing more things. Quantitative increase in discrete factual knowledge. Knowing harder things. Knowledge still factual but built by linking facts to existing knowledge that becomes increasingly complex.	Pramling (1983) Marton et al. (1993) Purdie (1994). Japanese Steketee (1996). 5 - 8 year olds.
Studying	Memorising and reproducing. Learning is remembering information and being able to repeat it when necessary. Learning is studying. Learning is the absorption of information.	Marton et al. (1993) Purdie (1994). Japanese Lonka et al. (1996) Lay people.
Applying	Applying. Learning is knowing more so you can use it later. Using knowledge for a variety of purposes. Vague, emphasis future aspirations: knowledge useful in the future (cf. Steketee's learning is to learn). Learning is the acquisition of skills, knowledge, concepts and attitudes that result in a change in behaviour.	Marton et al. (1993). Purdie (1994) Japanese Lonka (1996) Psych. Students.

Understanding	<p>Understanding. Learning is understanding so you can make sense.</p> <p>Rarely used visual metaphor, memorising and understanding.</p> <p>Searching for meaning. Lights 'click' on, facts are linked to make meaning, learning comes from within, there is an affective dimension.</p> <p>Real learning - which results from understanding.</p> <p>Learning to understand. Learning is seen as a change in way of thinking about reality.</p>	<p>Marton et al. (1993)</p> <p>Purdie (1994) Japanese</p> <p>Steketee (1996) 5 - 8 year olds.</p> <p>Mugler & Landbeck (1997). South Pacific islanders</p> <p>Pramling (1983).</p>
Seeing something in a different way	<p>Seeing something in a different way. Learning is opening up your mind so you can see things differently</p> <p>Idea of expansion, widening horizons.</p> <p>Constructing new understandings. Active learner who constructs a personal theory rather than pre-existing theory.</p> <p>Learning is an interactive process whereby structures for interpreting the world are formed and revised on the basis of information from the world.</p>	<p>Marton et al. (1993)</p> <p>Purdie (1994) Japanese</p> <p>Steketee (1996) 5 - 8 year olds.</p> <p>Lonka (1996) Psychologists</p>
Changing as a person	<p>Learning implies personal change. Not linked with evidence of a higher order conception.</p> <p>Changing as a person. Learning is a continuous journey where understanding new things makes you grow and change as a person.</p> <p>Personal fulfilment; growth, enjoyment, empowerment.</p> <p>A change in behaviour. A change in understanding A change in behaviour and understanding.</p>	<p>Watkins and Regmi (1992) Nepal</p> <p>Marton et al. (1993).</p> <p>Purdie (1994) Japanese</p> <p>Dahlin (1997) Nepalese</p>
Duty	<p>Learning as a duty. An obligation necessary for a students to one's parents and teachers.</p> <p>Learning is a moral obligation to God/some higher authority.</p>	<p>Purdie (1994) Japanese</p> <p>Cliff (1998) Black South Africans</p>
Bounded by time or context	<p>Much real learning occurs outside school.</p> <p>Learning as a process not bounded by time or context. A gradual continuous process. Life world external horizon very obvious.</p>	<p>Watkins and Regmi (1992) Nepal.</p> <p>Purdie (1994) Japanese.</p>
Social competence	<p>Learning as developing social competence. Social competence an identifier of intelligence.</p>	<p>Purdie (1994) Japanese.</p>
Empowerment	<p>There is a correct and incorrect knowledge.</p> <p>Learning is empowerment.</p>	<p>Watkins and Regmi (1992) Nepal</p> <p>Meyer (1997) Black South Africans.</p>

From an anthropological perspective then, culture and learning are related through this 'world view' resulting in a culturally specific relationship between ontology, epistemology and pedagogy. The nexus between culture and knowledge is well documented (e.g., Andrews & Hughes, 1988; Christie, 1985; Hughes & More, 1997; Jacob, 1992).

Traditionally, Indigenous knowledge is created in the Dreamtime and known by the ancestors. It is passed from generation to generation through stories and rituals. It is a cultural given: this is not to say that the knowledge does not change, but that the changes are, somehow, part of the story. Knowledge is received from the ancestors through the elders, and the main pedagogical process for this is transmission. For example, traditional Indigenous culture has a strong tradition of story telling for maintaining knowledge. It is possible that cultures with a strong tradition of faithful reproduction of received wisdom have a positivist view of knowledge rather than a relativistic view (Meyer, 1998). However, Andrews and Hughes (1988) argue that the particular stories told are images of truth and not abstract truths, and that symbolism is an important way of learning. They argue that "the world takes on meaning through abstract qualities, relationships and laws laid down in the 'dreaming'" (p. 9) suggesting that knowledge is not discrete, even though it is factual. Instead, knowledge is a complex inter-related holistic system.

There are further dimensions of access to, and ownership of, knowledge that contrast Indigenous knowledge with Western knowledge. In Indigenous Australian communities there is a collaborative holding of knowledge where no one individual needs to know everything. It is sufficient if someone knows, and knowledge is transmitted to particular people who have a right to that knowledge (Christie, 1982, in Harris & Harris, 1988). This contrasts with a Western view of knowledge where everyone is entitled to know everything and individuals can own particular pieces of knowledge.

It is possible to speculate from these understandings of traditional Indigenous culture about how learning might be conceptualised. Based on the premise that traditional Indigenous cultural knowledge is fixed and finite, the first three conceptions, which focus on quantitative increases in factual knowledge, would be expected to be prevalent. However, if Andrews and Hughes' (1988) view of Indigenous knowledge as complex, abstract and inter-related is accepted, then more complex conceptions focusing on the construction of meaning and establishment of relationships between and within meanings would be expected.

Indigenous Learning Styles

Many of the educational initiatives employed to redress the low retention and success rates of Indigenous students in the educational system focus on the construct of 'Aboriginal learning styles'. For example, the National Aboriginal Education Committee (1986, in Bourke et al. 1996, p. 2) refers to the differences in student learning styles as being a factor. There is large body of research on learning styles, particularly in North America, which suggests students from minority ethnic groups have different learning styles from mainstream students. This is supported by a limited amount of Australian research. Most of this literature concludes that there are culturally specific learning styles that are in conflict with the learning contexts of Western education systems and hence cause the educational failure of students.

Examples of the learning styles attributed to Indigenous Australians (summarised from Harris in Byrne, 1993, and Nicholls et al., 1998) include:

- learning by observation, imitation and repetition
- learning by personal trial and error
- learning in real life settings
- learning wholes and not sequenced parts
- learning context-specific skills rather than generalisable principles
- concreteness

- person-oriented and not information-oriented

Hughes and More (1997) list the following additional 'learning styles':

- group rather than individual orientation
- a spontaneous as opposed to a structured approach
- an uncritical rather than a critical approach to learning and knowledge
- holistic learning
- superior visual-spatial ability based on visual modality and imagery

It is clear from these lists that that '*learning style*' is a term that covers a range of meanings. Ryan (1992) argues that the learning styles literature is generally unhelpful because of confusion between the terms cognitive styles, cognitive tools or strategies, preferred sensory modes of perception and culturally learned learning styles. The majority of descriptions in the above two lists refer more to communicative and interpersonal styles than to learning styles.

McCarty (cited in Ryan, 1992) usefully describes two different interpretations of learning styles reported in the literature: *learning styles as performance generating processes* and *learning styles as performance*. Research that views *learning styles as performance generating processes* focuses on cognitive processes such as analytic/verbal vs. holistic/visual and attributes the individual differences in these dimensions to psychological or social causes and ignores the interactive context of the learning. The variation in perceiving, organising, storing or processing of information found in experimental situations is explained in terms of variation in learning styles. Ryan (1992) maintains that what is missing from this perspective is any notion of how learning happens.

He contends that a more useful view explains how learning happens. *Learning styles as performance* regards learning as a social process in which interactive and communicative values are embedded. How people interact with others as they come to acquire knowledge and skills has an effect on how the learner experiences learning

and the learning context. From the student's perspective, learning is more likely to happen in a context that is recognised as a learning context. Ryan (1992) argues:

Whether or not the interpersonal or social aspects associated with learning situations are actually regarded as a type of learning style, there can be little doubt that they have a substantial influence not only on how learning takes place, but also on what is or is not learned. (p. 173)

An approach where culturally learned learning performances are brought into focus is useful because it replaces a deterministic view of learning styles with a developmental view of *learning styles as performance*. How learning is approached reflects what is "socially appropriate in a particular context and for a particular group" (p. 173). Most learning styles attributed to Indigenous Australians are descriptions derived from observation of learning performances. They reflect the interpersonal and communicative practices commensurate with a culturally specific worldview. Although these are observations of learning and not accounts of the experience of learning, it is reasonable to assume that these interpersonal and communicative styles contribute to the 'experience' or conception of learning. Thus, at an individual level, cultural learning styles can interact with individual pre-dispositions to produce particular conceptions of learning.

Learning In Traditional Indigenous Societies

In traditional Indigenous societies, children do not often deliberately set out to learn. Rather, learning happens as an on-going individual activity incidentally through observation and practice (Harris & Harris, 1988). Repetition and rehearsal are important learning strategies. Indigenous children are raised to have a large amount of personal autonomy (Schwab, 1998). In terms of learning and pedagogy, this means they are responsible for, and the agents of, their own learning and are often seen rehearsing and practising. In traditional Indigenous cultures, this personal

autonomy is counter-balanced by a strong collective duty that maintains group cohesion.

In a recent study of 22 Indigenous students in the first year of a degree course, Wilss et al. (1999) identified four categories of informal learning:

- (i) acquiring skills by observation and sometimes imitation.
- (ii) acquiring cultural and social knowledge by transmission of information from family members or tribal elders.
- (iii) independently developing practical skills by active problem solving.
- (iv) independently seeking information in areas of interest by finding appropriate resources.

The first two categories reflect traditional Indigenous pedagogy and were identified by over half the students, whilst the latter two categories reflect a more Westernised view of learning. It is reasonable to expect elements of the traditional, informal learning system, such as strategies, contexts, and content, to be brought to formal learning environments (Ninnes, 1996 in Wilss et al., 1999). However, Wilss et al. (1999) found over half the students in their study identified categories of informal learning considered incompatible with their conceptions of formal learning, independently of whether the students identified more traditional or more Western informal learning experiences.

It is not easy to form a hypothesis about conceptions of learning identified by Indigenous students from knowledge of traditional Indigenous culture and learning. Traditional learning involves the transmission of factual knowledge and incorporates repetition and practice strategies, which might be expected to lead to accumulative conceptions of learning. On the other hand, the large amount of personal autonomy allowed to Indigenous people could lead to individuals who might regard themselves as agents of their own learning and who hold meaning-oriented conceptions.

Contemporary Indigenous Values

Whilst it is not appropriate to assume that traditional values necessarily apply to all Indigenous people, there is recent evidence that certain traditional values are pervasive and part of the contemporary Indigenous experience. Fogarty and White (1994) found that non-traditional Indigenous students still retained many traditional values in spite of attending 10 years of school and living in towns and cities. These values reflect collective interests over individual interests. Malin (1989, in Partington & McCudden, 1992) found evidence for extended family life and the use of certain economic and language styles, in varying degrees, to be common features of the contemporary Indigenous experience. The subtle and complex pervasiveness of traditional values is illustrated in the investigation into conceptions of learning identified by 22 Indigenous students by Wilss et al. (1999). They found that the students from remote areas or country towns, where there was still a strong cultural influence, identified informal learning experiences very similar to traditional learning. However, the majority of Indigenous students, who grew up in cities, described informal learning as a more independent activity than traditional learning. This might seem to suggest a rural/city dichotomy, but, interestingly, two of the city-reared students held the more traditional perceptions: one of these had grown up with a strong cultural influence, and the other believed her heritage was very important to her.

These three studies suggest that contemporary Indigenous culture retains values from traditional culture and therefore we may expect to find conceptions of learning which reflect these values. However, whilst culturally specific conceptions may exist, we would still expect a variety of conceptions reflecting the diversity of the contemporary Indigenous experience.

Because of the strong collective values identified in both traditional and contemporary societies, there may be a duty component reflecting collective values.

Also, given the marginalisation of Indigenous people in relation to the dominant culture, there may be notions of empowerment associated with some of conceptions of learning.

Summary Of Literature On Indigenous Learning

The contemporary Indigenous experience is complex and varied. It is not appropriate to speculate categorically about contemporary Indigenous experiences from knowledge of traditional Indigenous cultures. However, there is some evidence that some traditional values persist and are part of the contemporary experience. Whether these directly impinge on conceptions of learning is speculative.

Based on the premise that Indigenous cultural knowledge is fixed and finite, conceptions of learning that focus on quantitative increases in factual knowledge might be expected to be more prevalent. However, the argument that Indigenous knowledge is complex, relational, and abstract may lead to a suggestion that more complex meaning-oriented conceptions might be more prevalent.

From the literature on traditional Indigenous pedagogy it might be inferred that conceptions of learning based on the transmission of factual knowledge and incorporating repetition and practice strategies would be identified by Indigenous students. However, since these are the most dominant in the student population anyway, this would have no significance. On the other hand, the large amount of personal autonomy in learning allowed to Indigenous people could lead to individuals who regard themselves as agents of their own learning, in which case they might identify meaning-oriented conceptions.

Because of the strong collective values identified in both traditional and contemporary societies, there may be a duty component reflecting collective values. Also, given the marginalisation of Indigenous people in relation to the dominant

culture, there may be notions of empowerment associated with some of conceptions of learning.

Indigenous Students' Conceptions Of Learning

The majority of research into Indigenous student learning focuses on learning styles, and there is very little work that considers Indigenous students' conceptions of learning. Boulton-Lewis et al. (1997) conducted a pilot study with ten Indigenous students studying in higher education. From the analysis of the semi-structured interviews conducted by an Aboriginal research assistant they concluded that these students "view and approach learning in the same way as any other university students" (p. 23), that is, learning was *an increase in knowledge, memorising and reproducing or the ability to apply knowledge*. In addition, the students relied largely on strategies for transmitting and reproducing information. Boulton-Lewis et al. (1997) also tentatively suggested there might be another conception of learning, *learning as a duty*, that has a moral dimension since four of the students said that they were studying so that they could help their communities.

In a larger study by Wilss et al. (1999) involving 22 students in various first year degree courses, three main conceptions of formal learning were identified, two of which had sub-categories (see Table 3). These conceptions are not dissimilar to those identified by Marton et al. (1993), but have a stronger focus on learning as gaining understanding.

Table 3. Conceptions Of Formal Learning Identified By Indigenous Undergraduate Students (Wilss et al. 1999).

Conception	Form	Description
1. <i>Learning as acquiring knowledge</i>	1A. <i>Learning as increasing knowledge.</i>	Learning was about getting things into one's head.
	1B. <i>Learning as using knowledge.</i>	Learning was about being able to use what has been taken in.
2. <i>Learning as understanding</i>	2A. <i>Understanding and acquisition.</i>	Learning was acquisition through memorisation and then understanding what was remembered.
	2B. <i>Understanding, acquisition and use.</i>	This meant being able to use what was understood.
	2C. <i>Understanding, relating, elaborating and analysing.</i>	Students with this conception were interacting with the information.
3. <i>Learning as personal growth</i>	(<i>No variation in form</i>)	Students with this conception related learning to their life experiences and becoming a better person.

Chapter Summary And Conclusions

The conceptions of learning literature suggests the six conceptions identified by Marton et al. (1993) can be consistently identified in a range of learning situations. Broadly these conceptions can be classified as accumulative or meaning-oriented. The accumulative conceptions focus on the accumulation of discrete and finite knowledge whereas the meaning-oriented conceptions are transformational and focus on understanding the meanings of things. The accumulative conceptions seem subject to cultural influences and to have more variation within them than the

meaning-oriented conceptions They also occur most frequently and this may be linked to the emphasis on transmission and reproduction of knowledge in most secondary institutions. The meaning-oriented conceptions are more compatible with the goals of higher education.

The literature on Indigenous learning usually refers to traditional culture. Traditional pedagogy and epistemology may be at odds with University education. However, it is false to assume that traditional values reflect the diversity of contemporary Indigenous values and experiences. The very limited research into Indigenous students' conceptions of learning suggests that Indigenous students have similar conceptions to the majority of the student population, except with a stronger focus on understanding and possibly a moral dimension.

CHAPTER FOUR

METHODOLOGY

Introduction

The role and nature of research in the development and testing of educational theory depends on the stage of theory development, and different approaches are more useful at certain stages. For example, in the initial stages of theory development, an interpretive approach, such as phenomenography, is necessary to develop grounded theory. However, the in-depth interviewing and subsequent analysis required takes considerable time, so once stable categories begin to consistently emerge, research in the area should shift to developing more quantitative ways of gathering the information from students, such as questionnaires (Meyer, 1995; Meyer & Boulton-Lewis, 1997a). In order to do this, instruments need to be developed.

In terms of theory development, this study is taking place at the interface of grounded theory development and the operationalisation of that theory. The review of the literature concerning conceptions of learning indicates that stable categories are emerging from interview data (Eklund-Myrskog, 1998; Meyer & Boulton-Lewis, 1997b). A summary of these categories can be found in Table 2. Therefore it is an appropriate time to begin using more quantitative ways of collecting the data. This leads to the second research question of this study, which relates to the testing of the validity of a new instrument (the Reflections on Learning Inventory) to collect data on students' conceptions of learning.

In the following section, the phenomenographic approach for collecting and analysing qualitative data on students' conceptions of learning is outlined, and in the subsequent section the Reflections on Learning Inventory (see Appendix A) is introduced.

The Phenomenographic Approach

The phenomenographic framework underlying this study has implications for the methodology. Phenomenography aims “to reveal qualitatively different ways in which people experience or conceptualise ... various phenomena in the world around them” (Marton et al., 1997, p. 25).

Marton (1994) distinguished between phenomenology, the philosophical exercise developed by Husserl (n.d.), and phenomenography, the research method.

Phenomenology is a philosophical reflection on how the world is experienced, whereas phenomenography is a research method that encourages subjects to reflect on their ways of experiencing the world. Typically, conceptions are studied through the phenomenographic interview. Through these in-depth interviews with subjects, the experiences and understandings are jointly constructed, and “aspects of subject’s awareness change from being unreflected to being reflected” (p. 99). Thus, the subjects become like the philosophers in the Husserlian method. An important point that arises from using the phenomenographic method is that it is often an irreversible process and, in fact, is very close to a teaching situation. This means that the interviews are not replicable since the interviewees will have a changed conception, even if only slightly.

Phenomenography is usefully described by Svenssen (1997) as both a research orientation and an approach. The orientation aims to describe the variation in people's conceptions of phenomena and then to use these descriptions as a tool to study the phenomena. This leads to an approach that categorises the descriptions, has an exploratory form of data collection, and interpretive data analysis.

Data Collection

Typically data are collected through a semi-structured, conversation-like interview where the participants’ conceptions of a particular phenomenon can be explored in

depth. Phenomenographic interviews are a specific application of the open-ended ethnographic interview, which attempts "to understand complex behaviour ... without imposing any *a priori* categorisation which may limit the field of inquiry" (Fontana & Frey, 1994, p. 366).

Phenomenographic interviews are described as semi-structured. This means that at least a list is prepared in advance of the interview that notes the issues related to the research question and to be covered in the interview. More structure can be introduced to the interviews through listing a few key questions that will be asked and some ideas for prompting fuller responses to these questions. There is no order to the questions as such: "it is often better to follow the line the interview is taking and bring in questions as they become appropriate" (Entwistle, 1997a, p. 20). Guided by the issues to be covered, the interview is allowed to develop as a natural conversation providing fuller descriptions of the conceptions under investigation. The interviews are taped, and the tapes transcribed in full. These transcripts are the raw data for analysis.

It is important to note here an unexplained deviation from the standard qualitative interview where the researcher would also note non-verbal communication in the interview (see Fontana & Frey, 1994). Non-verbal communication such as body language, facial expression, tone of voice, and hesitation are important in giving meaning to a text. In addition, there are textual tools such as irony, sarcasm, metaphor and humour that can alter significantly the meaning of a text. Yet the most significant writers on phenomenography do not mention the need to note non-verbal communication and link it to the relevant sections of the subsequent transcripts for understanding. Repeatedly, the description of the data for analysis is solely the transcript of the interview (see Entwistle, 1997a; Marton & Booth, 1997; Marton et al., 1993; Marton et al., 1997; Prosser & Trigwell, 1999). Hasselgren and Beach's (1997) criticism that phenomenography has used "discourse without regard for discourse production" (p. 197) has some weight in this regard.

Further, transcribing the tapes is a skilled process. Embedded in the speech are nuances indicated by hesitation, humour, confidence, variations in speed, volume, and timing of the speech. These need to be transcribed as accurately as possible. It is also important to note missing data in the transcript, for example, when something was not clear enough to transcribe, as interpretation could be seriously affected by the omission.

Säljö (1997) draws attention to a more fundamental problem with the status of interview data in relation to phenomenographic theory. He notes that there has been a shift in phenomenography from investigating what people do to what people say they do. In other words, talk is assumed to be equivalent to ways of experiencing and not a choice about what to say about ways of experiencing. Säljö maintains what is being investigated are "utterances from individuals made in specific situations with varying motives" (p. 177). From the phenomenographic perspective, utterances are seen as indicative of ways of experiencing and the effect of the context in which the utterances are made is ignored. Shotter (cited in Säljö, 1997, p. 178) refers to these utterances as 'accounting practices'. Säljö (1997) emphasises the intertwined nature of language, culture and human experience and the role discourse plays in constituting the experienced world. Because accounting practices are social and cultural features, they are the frameworks through which people organise and understand their experience and talk. As Säljö (1997) explains, accounting practices:

socialise us into talking about and ... experiencing reality in culturally relevant manners. But the important point here is that accounting practices precede individuals and they are the tools by which the world is constituted and rendered "meaning-full" in a situated practice. (p. 182)

Thus people adopt and use certain accounting practices when they talk about phenomena. For example, learning becomes a "matter of taking over and accepting institutionalised accounting practices" (Säljö, 1997, p. 187), including, presumably,

the accounting practices for learning. According to Säljö, much phenomenographic analysis is, in fact, discourse analysis.

Data Analysis

According to Marton and Booth (1997) data analysis starts in the interview. The interview is iterative in nature since the researcher's emerging ideas are used to develop further questions in order to clarify or confirm these ideas. The main data analysis, however, takes place after the interview, using the transcripts.

Data analysis is based on two assumptions. Firstly, in common with the grounded theory approach (Glazer & Strauss, 1967, in Huberman & Miles, 1994), the analysis of the interview data is based on the principle that generalisations about specific contexts can be made because the number of qualitatively different interpretations people have of a phenomenon is limited. Secondly, it is assumed the data can be analysed independently of any *a priori* categorisation. That means, having conducted a literature review, the knowledge gained has to be suspended until experiences with the data suggest its relevance (Wilson, 1977). However, the conceptions of learning theory is moving beyond the developmental phase of grounded theory towards an application and testing phase. Consequently, there is also value in analysing data in terms of *a priori* categories to see if the emerging theory "fits" with new data.

Säljö (1988) describes the analysis process as a practical activity where "the analyst reads and rereads the transcripts several times" in order to "generate categories describing the conceptions ... that seem to underlie the statements" (p. 41). Although how these categories are abstracted from the transcripts is not explained, it is reasonable to assume that it involves using the now well-established procedures for the analysis of interview data described by Huberman and Miles (1994). These procedures, summarised in Table 4, were employed as appropriate in the analysis.

Table 4. Tactics For Analysing Qualitative Data (Huberman & Myles, 1994).

1. Noting patterns and themes.
2. Seeing plausibility.
3. Clustering.
4. Making metaphors.
5. Counting.
6. Making contrasts and comparisons.
7. Differentiation - unbundling of variables.
8. Subsuming particulars into the general and shuttling back and forth between data and categories.
9. Factoring.
10. Noting relationships between variables.
11. Finding intervening variables.
12. Building a logical chain of evidence.
13. Making conceptual/theoretical coherence.

Because phenomenographers are aiming to classify the range of conceptions of a particular phenomenon, once conceptions have been identified in the individual transcripts, it is usual practice to pool the transcripts and focus on the pool of meanings (Marton & Säljö, 1984). This enables the emerging categories to be described more fully. However, since reasonably stable categories for conceptions learning exist, in this study the transcripts were not pooled for further analysis.

Reliability And Validity Issues

Because of the highly reflexive nature of qualitative data collection, reliability is often low. To increase reliability, Le Compte and Goetz (1982) suggest clearly identifying the units of analysis and, if possible, using units of analysis previously

described by earlier researchers. In phenomenography, Marton argues that when data are reliable, other researchers should be able to recognise the same descriptions of categories in the same data. However, Sandberg (1997) is critical of interjudge reliability for practical reasons and especially from a theoretical stance. Instead he argues for 'interpretive awareness' in the researcher "to acknowledge and explicitly deal with our subjectivity throughout the research process instead of overlooking it" (p. 209). To aid in this, he suggests five steps which act as guidelines for the emerging interpretation. These are summarised in Table 5.

Table 5. Guidelines For Interpreting Data (Sandberg, 1997).

<ol style="list-style-type: none">1. The researcher must be oriented to the problem and how it appears. This requires clarification of the research question applied to the interview transcripts.2. Describe rather than explain what constitutes the experience under investigation.3. Judge all statements as equally important.4. Search for structural features. To do this, once a tentative interpretation emerges, the stability of this interpretation needs to be tested by applying different interpretations to the same data until a stable interpretation emerges.5. The final step is to use intentionality as a correlational rule. According to phenomenography, there should be a correlation between what the conception is and how it is conceived.

Le Compte and Goetz (1982) suggest that qualitative researchers use the idea of credibility rather than reliability. Credibility refers to how convincing the analysis is and how believable the findings are. Two procedures to increase credibility are summarised in Table 6. A focus on credibility and meaning increases the transferability of the research (Guba & Lincoln, 1988).

Table 6. Steps To Increase Credibility (Le Compte & Goetz, 1982).

1. Reporting the decisions made in data analysis for coding and categorisation as explicitly and transparently as possible. The analysis should read like an “operating manual” (p. 40) with precise descriptions of the strategies used to analyse the data so that other analysts could reproduce the same findings with the same data.
2. Including selected sections of the texts in the results to illustrate and support the decisions. Le Compte and Goetz (1982) refer to this as ‘thick description’.

However, as Entwistle (1997a) notes:

It is exceptionally difficult to report findings from this type of research in a fully convincing manner. To provide a description of the categories identified necessitates the presentation of the whole range of quotations covering the delimiting circumstances. Only in extensive research reports is this possible. (p. 21)

In qualitative research, data validity is increased by the same features that create the reliability problems, that is, the closeness to the participants and the data at its collection. However, validity can be reduced by certain researcher effects including researcher inexperience and/or bias in the interview. This may result in the framing of questions that lead the participant, the omission of follow up questions or poor choice of prompting questions. In addition, the reactivity of the participant to the interview situation can reduce validity. Strategies to increase the validity of the findings include searching for contrasts in the data; looking for comparisons; looking for outliers and extremes; testing rival explanations; looking for negative evidence; and, wherever possible, checking with the informants (Huberman & Miles, 1994).

The Reflections On Learning Inventory (RoLI)

The Reflections on Learning Inventory (RoLI) is being developed by Meyer (Meyer, 1995; Meyer & Boulton-Lewis, 1997a; Meyer & Boulton-Lewis, 1997b). The RoLI seems an appropriate tool to use as it is based on the original descriptions that gave rise to the six conceptions of learning categories identified by Marton et al. (1993).

The inventory uses a Likert scale to encourage respondents to reflect on their learning experiences and beliefs. The initial RoLI consisted of 116 statements (items) representing four domains: a) knowledge of learning, b) experiences of learning, c) influences on learning, and d) conceptions of learning. The phrases for the statements came largely from the research by Marton et al.(1993) and subsequent research into conceptions of learning by other authors (see Meyer & Boulton-Lewis, 1997a). Factor analysis by Meyer and Boulton-Lewis (1997a) confirms ten provisional scales. The instrument has been used in a number of contexts with Australian, Indonesian and South African students.

A short version is now available for trialling. This version consists of five items on each of ten scales relating to students' beliefs about learning, knowing, knowledge, and the relationship between understanding and memorising. This instrument is currently being developed and tested by a number of researchers including Fuller (1999), and Meyer and Boulton-Lewis (1997a; 1999). The scales and items are presented in Appendix A. It is this short RoLI that was used in the current study. Respondents record their agreement with various statements that reflect beliefs about learning, beliefs about knowledge, experiences of learning and influences on learning.

The RoLI inventory is intended to be a diagnostic tool designed to look at individual differences in students in contrast to general models such as the Study Process Questionnaire developed by Biggs (cited in Meyer & Boulton-Lewis, 1997a). Meyer

and Boulton-Lewis (1997a) argue that general models are not constructed to be sensitive to individual differences such as gender or cultural background, nor are they sensitive to different disciplines of knowledge. Consequently, these tools indicate that differences exist, but do not point to the causes or consequences of these differences. In contrast, the RoLI is claimed to be sensitive to individual differences and can be used diagnostically, for example in providing constructive feedback to the participants.

Further, Meyer and Boulton-Lewis (1997a) argue that the phenomenographic studies from which conceptions of learning have been identified do not show the individual variation within each conception of learning, nor do they indicate the relative occurrence of each conception of learning in a student population. Such information becomes available from the RoLI data.

One criticism of the RoLI is that by taking the statements out of the context of the phenomenographic interviews in which they were made, much of the nuance of their meaning has been lost and the statements become harder for the respondents to interpret. The internal reliability and validity checks in the instrument development phase are aimed at correcting for this.

The use of an inventory in this manner complements and enhances the use of phenomenographic interviews in two ways. Firstly, reliability, which is weak in qualitative analysis, is an important consideration in the construction and testing of an inventory that results in data that is standardised and comparable. Secondly, the use of the inventory reduces researcher reactivity in the study. Thus the data from the two methods used together can be expected to build a more valid and reliable picture of students' conceptions of learning than the use of either method alone.

Cultural Issues In Research

Research Paradigms

Most of the Australian Indigenous research has been conducted with remote traditional communities within an anthropological paradigm. Nicholls et al. (1998) argue that this pervasive paradigm in Indigenous education and research considers Indigenous Australians as a culturally distinct group in contemporary Australian society. They see this reflected in a research orientation that focuses on cultural practices in traditional Indigenous groups and attempts to apply those research findings to all Indigenous Australians. They believe this view ignores the diversity of contemporary Indigenous experiences and the position of Indigenous Australians as an ethnic minority in their own country.

In the development of an Indigenous educational theory that challenges binary constructions of Aboriginality and Whiteness, alternatives need to be considered. Phenomenographic studies that consider individual differences within groups and minimise the differences across groups, such as the ones by Boulton-Lewis et al. (1997), Wilss et al. (1999) and this current study, are useful alternatives worth considering.

Effects Due To Method

Padilla and Lindholm (1995) make the well-founded criticism that educational research with minority cultures often confounds ethnicity, social class and culture, each of which has been shown to affect educational outcomes. They argue that by ignoring the heterogeneity within the group under study, the results become invalid.

The Indigenous participants in this study were expected to exhibit much heterogeneity in educational background, socio-economic status, age and lifestyle. The main purpose of this study is to explore the heterogeneity of the group in relation

to conceptions of learning. Hence this study uses a descriptive, qualitative method and diagnostic rather than general instruments that seek to explore and describe experiences of the participants. An emic approach, such as this, is assumed to have more validity than an approach that uses categories previously identified in other cultures with the assumption that they are universal. It has already been noted in an earlier chapter that whilst there appears to be some stability of some conceptions across cultures, there are also local, culturally specific variations (Eklund-Myrskog, 1998). The qualitative aspect of the study will increase the likelihood of identifying and describing the actual conceptions of learning of the participants, including any local, culturally specific variations.

Effects Due To Instruments

Culture can affect the construct validity of the instruments being used. The RoLI has been developed with the assumption that there is some universality of the conceptions of learning identified by Marton et al. (1993). It is being tested across a number of different cultures including Black South African, Australian and Indonesian by Meyer (1997), Fuller (1999) and Boulton-Lewis (Meyer & Boulton-Lewis, 1999) respectively. Meyer has tested the RoLI with a Cronbach alpha test and exploratory factor analysis as recommended by Padilla and Lindholm (1995). Results indicate that the items appear to have equivalence across cultures (Meyer, 1995; Meyer & Boulton-Lewis, 1997a).

Effects Due To Gender, Race And Class

The researcher is non-Indigenous, female and middle class, which makes gender, race and class significant issues in this piece of research. This can affect the validity and reliability of the research in a number of ways. For example, most research

involving Indigenous people has been comparative with the majority population, and the Indigenous community is quite cynical about the value of *wadjella*⁴ research for Indigenous people. Having been surveyed, observed and interviewed for most of contact history, they see little evidence of an improvement in conditions for their people:

Aboriginal people have been critical of researchers for a long time because research related to us over the years has failed to produce any perceived return or advantage to Aboriginal people. (Bourke, 1995, p. 134)

Feelings of exploitation and misrepresentation have led to an increasing resistance to research conducted by non-Indigenous researchers (Bourke, 1995). This attitude can lead to a general lack of concern in answering the questionnaire and lack of co-operation in the interviews, although this was not detected.

Alternatively, participants might deal with the situation by making assumptions about 'what the White lady wants to know' and tell her what they think she wants to hear. Acquiescence is noted to increase with lower socio-economic status groups in America (Padilla & Lindholm, 1995) and can make cross-cultural comparisons difficult (Watkins & Regmi, 1995). The denial of traits perceived as undesirable was also noted to increase with lower socio-economic status groups in America (Padilla & Lindholm, 1995). In the current research this may be a factor that results in participants assuming there is a 'right answer' and guessing it. Acquiescence and social desirability cannot be ignored as possible influences in this study.

The validity of the research may also be affected by gender issues. Traditional Indigenous cultures are often highly sex-segregated and older male candidates from more traditional Indigenous cultures may not be comfortable talking to a woman (K.

⁴ A local Aboriginal word for a white person.

Mallard, Indigenous lecturer, School of Indigenous Australian Studies, personal communication, Nov 1988). Whilst there is some evidence that a White woman researcher may be given the status of a man in some cross-cultural situations (Fontana & Frey, 1994), gender could affect the credibility of the interview.

Effects Due To Specific Cultural Values

Smith (1990, in Padilla & Lindholm, 1995) found a number of cultural features that have confounded results in American studies, included respect for authority, primacy of relationships and modesty. With Indigenous participants, the results could be similarly confounded by the perception of a White teacher as an 'authority', by the primacy of relationships in Indigenous culture, and the Indigenous construct 'shame'⁵.

There is a further cultural issue in the interview situation concerning the asking of questions. In many traditional Indigenous cultures, asking questions and direct eye contact are considered rude.

The RoLI responses may be affected if Indigenous Australian people have a cultural tendency to respond to a Likert scale in particular ways (Padilla & Lindholm, 1995; Watkins & Regmi, 1995). Although no research was found investigating whether such tendencies are displayed by Indigenous Australians, the possibility that this may affect the results cannot be ignored. Harris and Harris (1988) suggest that Indigenous students are likely to perform better in tests when they see the point of them.

⁵ An Aboriginal construct related to being in unwelcome prominence in front of others (Malcolm, 1998).

The Role Of Indigenous Academics

Because this research is being conducted by a non-Indigenous researcher, it is important to have Indigenous academics interpret the results. This will:

lend a dimension of authenticity to the prevailing theories about [their] communities ... [and] to provide [their] own perspectives regarding ... assumptions about [their] values, culture and language. (Reyes and Halcon, 1988 in Padilla & Lindholm, 1995 p. 103)

This need for Indigenous consultation is echoed in the Australian context by a number of Indigenous researchers, for example, Bourke (1995).

Chapter Summary

The use of semi-structured interviews allows for the identification of conceptions specific to this group of students while the use of the inventory is designed to complement this approach and increase the reliability of the results. In addition, it is intended that findings from the interviews will provide a validity check on the inventory.

A significant number of cultural issues arise because the researcher has different ethnicity, class and culture from the participants. The study was designed to minimise the effect of these factors.

CHAPTER FIVE

DATA COLLECTION AND ANALYSIS

Introduction

The aim of this research is to find out what conceptions of learning are identified by Indigenous people entering a university preparation course. Two complementary methods were used to investigate which conceptions of learning students endorsed: an inventory and an interview. This chapter describes the data collection process and subsequent analysis procedures.

Design

All entrants to the one-year preparation programme for Indigenous people at an Australian university were asked to complete an inventory. Of those who returned the inventory, nine were interviewed in depth about their conceptions of learning. These nine were opportunistically selected by their availability.

The data from the interviews and inventories were analysed separately and independently. The interviews were analysed first before the RoLI data had been seen. This kept the analysis of the interview data free from bias introduced by knowledge of the RoLI data.

After both sets of data had been analysed, the interview analyses were compared with the data from the completed inventories for the same subjects. Table 7 outlines the design of the research.

Table 7. Stages In The Research Design.

1. Successful candidates from the annual Aboriginal Student Intake Test (ASIT) invited to complete a questionnaire that includes the RoLI. 78 questionnaires administered, 36 completed and returned.
2. From the participants who returned the inventory, nine entrants were opportunistically selected for an in-depth interview.
3. Analysis of interview data – associated with a pseudonym.
4. Analysis of RoLI data – associated with a participant number.
5. Retrieval of inventory data for each interviewee.
6. Comparison of analysed data from RoLI and interviews.

The Students

All the entrants to a one-year university preparation programme for Indigenous people were asked to fill in an inventory. The inventories were returned by 36 of the 78 new students, representing a return rate of 46%.

The sample consisted of 36 students with a mean age of 32 years, which is similar to the mean age of all the entrants (31). The majority of the sample, like the whole group, were in their twenties and thirties, and, again like the whole group, there were twice as many female as male students. Students studying on-campus rather than externally were slightly over-represented in the sample (39%, compared with 21% of all entrants).

Most of the sample had reached at least Year Ten in their formal schooling but a third had left school before this and six had reached Year 12. On average, the entrants had left formal studies approximately nine years ago, but half had studied within the last five years. Fourteen entrants in the sample were the first in their extended family to study at university.

Instruments

The study used two complementary methods to collect data: a questionnaire which included the short *Reflections on Learning Inventory (RoLI)* being developed by Meyer (1995; Meyer & Boulton-Lewis, 1997a; Meyer & Boulton-Lewis, 1997b) and semi-structured interviews.

The RoLI uses a Likert scale to encourage respondents to reflect on their learning experiences and beliefs. The items in the inventory were derived from a range of sources including the interview transcripts presented by Marton et al. (1993). The inventory contains five items on each of ten scales relating to students' beliefs about learning, knowing, knowledge, and the relationship between understanding and memorising. The inventory was prefaced with an introduction that explained the purpose of the study and showed some examples of the items and how to record responses.

Biographical data relating to gender, mode of study, level of formal education previously attained and length of time since last period of study were collected in a second section of the questionnaire following the inventory and from candidates' enrolment details. The questionnaire, which included the RoLI, is appended (see Appendix B). Semi-structured phenomenographic interviews were used to provide a deeper understanding of individual student's conceptions of learning. Students were asked the following questions: What do you think learning at university will be like? When you say you are learning something, what do you mean by 'learning'? How do you know when you have learned something? When you have set out to learn something really well, what sorts of things did you do? The interview schedule can be found in Appendix C.

Procedures

Each year, the Centre for Aboriginal and Islander Students conducts the Aboriginal Student Intake Test (ASIT) specifically for Indigenous people seeking entry to the University. The data for this study were collected from successful applicants immediately following their ASIT. The successful candidates were invited to complete the inventory and return at a later date to take part in an in-depth interview.

Permission to collect data for this research was negotiated with the Head of Centre and the ASIT co-ordinator, both Indigenous people. The purpose of the study was explained to prospective students during the first ASIT information session by the researcher, who is also a lecturer on the university preparation course. It was explained that an understanding of prospective students' experiences and beliefs about learning could benefit these students in two ways. Firstly, it would be used to inform curriculum design and teaching methodology and hence improve the course, and secondly the inventory would be used to provide useful individualised feedback about conceptions of learning.

Candidates were asked to volunteer to participate if they were successful in gaining entry to the university preparation course. They were informed that participants could request feedback about the findings of the study and the analysis of their personal RoLI.

Participants were assured of their right to privacy and that, when published, the study would use pseudonyms and not describe any individual in a way that they could be recognised by some one else.

Administering The Inventory

Only nine successful candidates were able to complete the inventory during the ASIT period, the remainder of the entrants were either too tired or short of time. Therefore

the inventory was mailed to the remainder of the entrants including entrants tested elsewhere in the state. Fourteen of these were returned. In addition, the inventory was administered to the thirteen internal students during the first week of semester. A total of 36 completed inventories were returned, representing 46% of the new student intake.

The participants completing the inventory on campus were verbally informed of the purpose and benefits of the study and introduced to the inventory. Instructions about the inventory were read to the respondents and examples discussed. Any statements that were not clear were explained or rephrased. It should be noted that the students to whom the inventory was mailed did not get the same opportunity to clarify the meanings of the statements in the inventory.

Conducting The Semi-Structured Interviews

Because of the reactivity of the interview situations, in all cases the interviews were conducted after the questionnaire had been completed. Nine entrants were opportunistically selected for interview.

The interviews were conducted in the lecturer's study or over the telephone in a conversation-like manner. The participants were informed again of the purpose and benefits of the study and made aware that the interview would be taped and that the interviewer would make notes.

The interviews commenced with four questions to set the context and start the discussion, followed by the questions about learning itself. Where necessary, the interviewer used prompting questions either for clarification or to elicit more information. As the interview proceeded, emerging interpretations were offered to the interviewee to check for validity using reflective listening techniques. The interviews lasted from between 25 minutes to 45 minutes.

The nine interview tapes were transcribed by a typist and subsequently analysed.

Issues In Data Collecting

Whilst it is not desirable to collect data during a 'testing' type situation, this was the best opportunity to get data from a sufficiently large group of people. If participants thought that the interview was in any way part of the assessment procedure, they might be tempted to provide what they thought was the 'right' answer. Therefore, it was emphasised that the ASIT process was completely finished at the time the students were asked to fill in the inventories. In order to encourage them to answer carefully and truthfully, the researcher also emphasised that the study had the potential to benefit the students and others like them and offered personal feedback on the inventory data.

Specific Cultural Issues

It was noted in the previous chapter how the Indigenous community is generally fairly cynical about the benefits of research for Indigenous people and that feelings of exploitation and misrepresentation have led to an increasing resistance to research conducted by non-Indigenous researchers. Because the researcher is non-Indigenous, it was important to develop the trust of the participants. The likelihood of this happening was increased by the candidates noting the acceptance of the researcher and her research by Indigenous colleagues. The researcher and the research question were introduced to the participants by Indigenous staff in a manner that indicated their acceptance of her as a suitable person to be conducting this research and her research as worthwhile. In addition, by the time the data collection for this study took place, the researcher was already a familiar person to the candidates, having joined in with information sessions and morning teas during the two-day ASIT period.

It is believed that an acceptable level of trust and rapport to encourage co-operation was developed. However, the participants would still have constructed the researcher as *wadjella* and this could have affected both the validity and reliability of the findings. For example, the participants may have been trying to guess a 'right' answer. Alternatively, given the primacy of relationships, authority and modesty, the participants may simply have been trying to please the 'White lady' by telling her what they think she wants to know, rather than put their own view forward.

Understanding The Language And Culture

Fontana and Frey (1994) discuss the importance of understanding the culture and language of the respondents. The researcher has six years of experience working with Indigenous people in this University setting, working with students studying on campus and externally. She has occasionally acquired the privilege of 'auntie' status, indicating an acceptance by the students and recognition of her cultural sensitivity.

The language used in the semi-structured interview schedule and in the questionnaire was checked for appropriateness. Where there was confusion in the interview, clarification took place. However, the language used in the inventory was more problematic. It could not be amended easily without potentially affecting the reliability and validity of the instrument. Participants were encouraged to ask if they wanted any of the statements explained and, although few did at the time, some said afterwards they had had difficulties with some of the statements.

For many traditional Indigenous people the asking of direct questions and direct eye contact are considered rude. This could have been the case for some participants. It was assumed that those participants who agreed to participate in the interview were able and willing to switch between cultural practices for the duration of the interview and work in *wadjella* way.

Some of the cultural and language barriers would have been reduced if an Indigenous person were part of the research team (Padilla & Lindholm, 1995). Unfortunately, this was not possible within the scope of this study. However, Indigenous staff were present when the participants complete the questionnaire.

Data Analysis

There were two different kinds of data to analyse: the texts from the semi-structured interviews and the data from the inventories.

Interview Transcript Analyses

The nine interview transcripts were analysed to see what conceptions of learning the participants identified. Using well-established qualitative techniques from grounded theory (Huberman & Miles, 1994) a search for patterns or themes was conducted and then these were verified in an iterative process. Within the resource limitations on this study, it was not possible to use multiple researchers to analyse the transcripts.

Initially, the nine tapes were listened to and the transcripts read simultaneously to check for accuracy in transcription and to note any expressions of humour, doubt, or conviction. The transcriptions were then entered into QSR NUD*IST⁶ computer software as raw data for analysis. QSR NUD*IST is:

designed to aid users in handling Non-numerical and Unstructured Data in qualitative analysis, by supporting processes of coding data in an Index system, Searching text or searching patterns of coding and Theorising about the data. (Qualitative Solutions and Research Pty Ltd, 1997, p. 2)

⁶ QSR NUD*IST: QSR stands for Qualitative Solutions and Research, NUD*IST stands for Non-numerical Unstructured Data Indexing Searching and Theorising.

NUD*IST allows the researcher to create related and free categories, to code text to categories, to search for specific text, to investigate relationships between categories, to develop and investigate matrices and overlap in a very flexible way without losing the integrity of the original transcripts.

When analysing qualitative data, according to Miles and Huberman (1984), any existing categorisation should not preclude a decision to create another category. Conceptions of learning have been well researched and categories already exist in the literature. However, since data from Indigenous students is not a significant part of the conception of learning research, the possibility of new conceptions of learning emerging and being categorised must be allowed. The data were coded in three ways to allow for the emergence of new categories.

In the first instance, knowledge of existing categories was suspended, and the data were analysed in terms of recurring themes in the data. These themes reflected the variation in existing descriptions of categories of conceptions of learning. The twelve themes identified in the data are presented in Table 8. Exploring the data in terms of these themes allowed it to be cross-referenced to subsequent analyses.

In the second analysis of the data, NUD*IST was used to code the data in terms of the established conceptions of learning discussed in Chapter Three and tabulated in Table 2.

Thirdly, the transcripts were examined for expressions that reflected the RoLI scales in order to allow comparison of the data from the interviews with the questionnaire data. This gave a number of cross-references that helped to strengthen the case for a particular interpretation.

The results of the second and third analysis are described within each case study in the next chapter.

Table 8. The 12 Themes Identified In The Data Analysis.

1. Whether the focus was on acquiring or using knowledge.
2. How knowledge is acquired, whether it is absorbed or constructed.
3. The role of the teacher in learning.
4. Where the control of learning is located.
5. How knowledge is conceptualised.
6. Whether there is reference to metacognitive activity.
7. Students' motivation to study.
8. Meanings of, and relationships between, remembering, understanding and memorising.
9. Whether attention was directed to the learning material or beyond to the phenomenon to which the material referred.
10. Strategies for learning.
11. References to learning outside university.
12. Whether learning is located in the study situation or life world.

In order to stay close to the interview context in the interpretation and coding, the researcher played the relevant tape simultaneously with the reading and analysis of the transcripts.

Following these initial analyses, the common codings between the twelve themes and the conceptions of learning and RoLI factors were investigated, explored and cross-referenced.

Because of the cultural nature of the study, it was important to have Indigenous academics interpret the results as this increases the authenticity of the interpretation (Reyes & Halcon, 1988 in Padilla & Lindholm, 1995). This was done by discussing

emerging themes with Indigenous colleagues involved in teaching and supporting Indigenous students.

RoLI Data Analysis

Individual profiles for the participants in the interviews and a whole sample (n=36) profile were mapped. These showed the extent to which the students, individually and as a group, endorsed particular scales. The group analysis yielded simple statistics. Data about the medians, interquartile ranges and ranges allowed useful within-group comparisons for each factor. It was beyond the scope of this exploratory study to perform any further statistical analysis on the RoLI data. However, an investigation of the statistical significance of the data would be worthwhile future research.

Chapter Summary

A questionnaire containing the Reflections on Learning Inventory (RoLI) was completed by 46% of entrants (n=36) to the university preparation course for Indigenous students. Nine of these entrants were interviewed and these interviews analysed in depth. The data were collected and analysed in a way that took into account the issues raised in the literature concerning researching with ethnic minorities, questionnaires, and phenomenographic interviews. The findings of the data analyses are presented in the next chapter.

CHAPTER SIX

ANALYSIS OF THE INTERVIEW

Introduction

The principal question for this research is: What conceptions of learning are identified by Indigenous students entering a university preparation course? The second question relates to the validity of the methods used to collect data. Conceptions of learning identified through semi-structured interviews were compared with conceptions of learning identified through the *Reflections on Learning Inventory* (RoLI).

The findings are presented in two chapters. The findings from the analyses of the nine semi-structured interviews are presented in this chapter. Each participant is treated as a case study where a picture is developed of what s/he thinks learning is and how s/he experiences it. The key questions for use in the interview are available as Appendix C. The conceptions identified in the case studies are then organised into conceptions of what learning is, conceptions of the result of learning, and conceptions of how learning happens. The data from the RoLI are presented in the next chapter.

Overview Of The Analysis Of The Interview Data

In all nine interviews, the prior and superordinate conception *learning as a general increase in knowledge* was identified. In addition, accumulative conceptions and meaning-oriented conceptions were identified. However, the analyses of the interviews did not fit easily with existing categories of conceptions.

Whilst every effort was made in the interviews to allow for a full exploration of conceptions, the conceptions described in the interview data are inevitably

fragmented and incomplete. The data from the interviews represent only a vignette of a conception (Taylor, 1996) and at another time a different vignette may be in focus.

Each interview is described as a case study where the participant's espoused views of what learning is, how it happens, and how the results are applied are discussed.

Because there was not always consistency between the 'what' and the 'how' aspects of learning in the interviews, the case studies have been labelled according to both of these aspects. Pseudonyms are used to protect the identity of the interview participants.

The first four participants presented identified accumulative conceptions. Within them, there is a shift from a very simplistic conception where the teacher is paramount. In this conception, doing the task set by the teacher will automatically result in learning. In the other conceptions, the learner actively engages in the teacher-set tasks and has to take responsibility for memorising the content. Where understanding is mentioned, it involves being able to memorise the meaning of the content (see Marton et al., 1997). The remaining five participants identified conceptions that were meaning-oriented.

The Case Studies

Rhonda: Learning is increasing one's knowledge automatically by physically doing a set task.

Rhonda was a 21-year-old woman who reached Year 12 of schooling. She had experience working in a primary school. Rhonda identified a vague and unreflected conception that was similar to the primordial learning conception 'learning is to learn' identified by Steketee (1996), and in which there is no indication of awareness of any mental processes:

Int: So you would be looking at new and different things, and what do you actually mean by learning?

Rhonda: Ah that's a hard question!
Int: I know! You are thinking of being a teacher, what's learning?
Rhonda: We're just used to saying the word 'learn'

Often it seemed she was thinking about things for the first time. This 'taken-for-grantedness' of learning was also evident in her final question to the interviewer when, beginning to be curious about 'learning', she asked whether the interview questions "had a yes or no answer or not":

Int: So the exam will cover what you have already learnt and you have learnt it because you are able to do the assessment.
Rhonda: Yeah. Do these have a yes or no, or not?
Int: No, none of them have a yes or no, they're all conversations like this because everyone has got different views.

According to Rhonda, learning had a practical emphasis: when something has been learnt it could be done automatically:

Rhonda: Like if you are really stuck on something you know, you don't know it properly. If you do know it, you just whiz straight through it and you know that you have learnt something.

For Rhonda, learning happened, quite simply, by doing the tasks set by the teacher:

Rhonda: Well, I've heard that you do a lot of pracs. And, um, for learning of course you have to study each night and that. You're learning new things every day.
Int: Yep. What sort of study will you do at night do you think?
Rhonda: What sort of study?
Int: Yeah, what will you actually do with your books or whatever?
Rhonda: Reading, some essays.
Int: Some essays, some writing?
Rhonda: Yes.
Int: Things you've been set to do?
Rhonda: Yes.

There was no description of how Rhonda studied, instead learning appeared to happen automatically by doing the things set by the teacher. This is similar to a conception of learning found in young children by Pramling (1983): *Learning is physically doing*. "The learning is a consequence of just doing and nothing else" (p. 111). For example, to prepare for an exam, Rhonda said:

Rhonda: I would make sure I would finish my assessment first.
Int: Ok and why would that help?
Rhonda: When you have finished all them your exam will probably cover all of them. Cover the whole assessment 1, 2, & 3.

A number of times in the interview, 'learning' and 'teaching' were interpreted by Rhonda as interchangeable labels and when asked about learning she talked about teaching. For example when asked how she would explain to an alien what learning was, she replied:

Rhonda: I'd learn you the different, um where an alien live compared to where we live.

It appears Rhonda used "I'll learn you" to mean "I'll teach you", and there may well be confusion in meaning. It is as though they are not separate concepts but inextricably linked so that learning inevitably results from doing the activities designed by the teacher.

Typical of Rhonda's conception of how learning happens was a naming of the activities that she would engage in, such as reading, or note taking, and the resources she would use without further description or explanation. For example, to prepare for a topic, Rhonda would "Go to the library, look it up and take lots of notes."

In summary, Rhonda talked about learning as a practical activity in a way that was reminiscent of the primary school children in the studies by Pramling (1983) and Steketee (1996). This was categorised by them "*learning as doing*".

Students who hold this conception associated learning with something they can do or are learning to do, and often failed to make any distinction between learning and doing. (Steketee, 1996, p. 55)

Although Rhonda's 'doing' was slightly more sophisticated than that of primary school children (for example, instead of 'counting' Rhonda talks about 'doing a prac.'), it was still the 'doing' that seems synonymous with learning. There was an inevitability that having 'done it', 'it' must have been learnt. There was little initiative shown on Rhonda's part other than deciding to practise repeatedly. Learning happened automatically by doing the activity required by the teacher, (hence the teacher can 'learn' someone). The teacher was seen as instrumental in whether learning happened. Rhonda was either not able to describe what happens in the learning activities or believed it was self-evident. Either way this suggests a lack

of reflection on learning. The paradoxical and most dominating characteristic of this conception is the 'taken-for-granted' nature of learning, its self-evident obviousness, when the last thing that is obvious is the nature of learning.

Josey: Learning is increasing one's knowledge by doing study activities.

Josey was a 25-year-old woman who left school at the end of Year 11. She had since undertaken vocational studies at a College of Technical and Further Education (TAFE). She was the first in her family to study at university level. The conception she identified is distinguished from that of Rhonda by an increased awareness that active cognitive engagement with the task is necessary.

For Josey, learning was being able to do a set task. Her response to the question 'What is learning?' was in terms of the outcome of learning:

Josey: Be able to do something, be able to have the ability to do a task that's set out before you.

This involved "finding out information" and "learning about that certain information".

Josey's ideas about learning were similar to Rhonda's in many ways. There was a similar vagueness about what learning is, although Josey was more aware that she had some difficulty explaining it. For example, Josey ended with a tautology because she could not express learning any other way:

Int: What's learning? What do you mean? Can you try and explain it to me.

Josey: I dunno, I guess just by finding out information, like finding out information. Does that sound right?

Int: What else do you want to say?

Josey: no idea. You just learn, that's it. You just learn.

Like Rhonda she knew she had learnt something when she could do a set task, in Josey's case a teacher-set task. In common with Rhonda, there was a belief that a teacher is necessary for learning. This is illustrated by her answer to how she would go about learning:

Josey: Find someone who teaches you.

Josey also had a similar difficulty explaining how learning happens. Like Rhonda, she named the resources she would use and the activities that she would do, but was not able to explain how the resources would be used. Thus 'doing research' was simply going somewhere and finding something:

Int: All right, if you need to learn something, what do you do?

Josey: I dunno, you just go and find out about it, you go and do research. Do research.

Int: So when you need to learn something, you go and find out about it. What do you do? How do you find out about it?

Josey: By doing research. Libraries and things like that. Through books.

However, Josey's conception of how learning happens was more sophisticated than just doing. She was aware that the learning happened through the doing and required deliberate effort on her part. For example, this was indicated by how she would learn things really well:

Josey: Um, like taking down important notes and maybe memorising certain main points.

These strategies were clearly associated with a belief that knowledge is discrete and factual. She described how bits of information from a number of sources were put together for an assignment:

Josey: Well, yeah. Yeah, yeah, and the more notes, I find that the more notes that I make the better essay or assignment in the end, because I can pick and choose, and like take bits out of the notes and use them or might not use them and can change it, so it can be that way.

In selecting which bits to take and put into an assignment, Josey seemed to be describing an accumulative process, indicating again a quantitative view of knowledge. But there was also an incipient awareness of the need to evaluate the material, indicated by her "picking and choosing" what to include.

The relationship between memory and understanding was quite clear for Josey. In some circumstances memorising was a useful and sufficient learning alternative to understanding, as the following quote illustrates:

Josey: Um, to go in depth, to be in depth within a subject. ...because you can learn it but you might not understand it. So you can learn it but, like, and just learn and to know it, but you might not understand it.

In summary, for Josey learning was clearly related to learning in an educational context and there was an emphasis on the application of the results of learning. The 'what' aspect of this conception is very similar to the conception '*increasing one's knowledge*' described by Marton et al. (1993). Josie regarded learning as a quantitative increase in knowledge, for which the teacher was largely responsible. The creation of meaning was related to understanding, which was not essential to learning. There was a technical emphasis on the task and clear acquisition and application phases that involved memorising and reproducing information.

The 'how' aspect was similar to the explanation described in the previous case study (Rhonda) where learning was seen largely as a consequence of doing various activities: doing research, reading, studying. However, there was a difference from Rhonda's conception in the relationship between the doing and the learning. Whereas for Rhonda the 'doing' was the 'learning', for Josie, the learning happened through doing. This separation of learning from doing indicates awareness that some mental effort, for example, finding particular bits of information, was necessary on her part for learning to happen. This awareness of mental activity was not mentioned by Rhonda.

Associated with both Josey's and Rhonda's conceptions were a taken-for-granted nature of learning and tautological explanations; an emphasis on learning by doing; a vagueness in defining learning, and a strong emphasis on the teacher's role.

John: Learning is increasing one's knowledge by doing study activities, specifically repetition and practice.

John was a 27-year-old male, who last studied at high school where he reached Year 11. Since then, he had worked in a range of temporary and manual jobs. For John, learning was:

John: Taking it in, not forgetting any thing. Taking it in, processing it, understanding it, and keeping it there.

For John, understanding was part of the acquisition process, a form of understanding also found by Wilss et al. (1999).

John knew he had learnt something when he could recall it:

John: Just when I can bring it back, when I know exactly what I am doing. Someone can tell me as little as needs to be told to do something and I can do that and some.

John strongly identified the processes of observation, practice, and recall whereby something is not forgotten:

John: Yeah. I have to be shown me a few times. For me personally, I find if I go over something like a few times over a couple of days and then say a week or a month later go to it and try to, go from scratch straight away. If I can do it then all right, I've learnt it.

He drew on his experiences of learning skills, wondered if university learning would be similar, and decided that the big difference would be not much opportunity to practise because of the amount to learn.

He learnt from his notes by 'revising', which, he explained, was like practice:

John: Well, it's sort of the same as driving the front-end loader everyday, you know, you revise all your notes - it's like you're going to that class everyday until it's sunk in.

In order to learn things, John said he "goes over and over it again", trying to memorise the meaning, and reading until he can recall. Like Josey, there was an indication of an awareness that some evaluation of the material was necessary in order to identify the main points worth memorising. This may require him to "go

over highlighting things I think are important in the subject”. The repetition was important:

John: Yeah the more you do of the one thing you are supposed to learn, the more you are going to learn that one thing, know what I mean? The more it's got to sink in. You can be told it once and learn it, but I think if you're told it a fifty times its sort of like when you get told off by your parents.

In summary, John identified an almost typical *learning is an increase in knowledge* conception as described and modified by Marton et al. (1993; 1997). Learning involves the “collection, consumption and storing of ready made pieces of information” (Marton et al., 1993, p. 285). The storing was made possible through repetition and practice, and the results of learning were being able to recall or apply the knowledge. John seemed aware that learning usually required deliberate effort on his part, although sometimes instantaneous learning was possible. John’s conception of understanding was being able to memorise meaning.

Mary: Learning is increasing one’s knowledge by doing study activities.

Mary was 35 years old, reached Year Ten at school and studied at TAFE last year. She was not the first in her family to study at university. Mary’s conception focused on learning as an increase in knowledge that could be used later. Knowledge was learnt from textbooks and other sources. One of the things that could be learned was a different way of seeing things, that is, students were taught different ways of seeing specific phenomena. For Mary learning was:

Mary: Well, absorbing the information, like, from either lectures or the information they give you, the books and things, and give you a different um outlook on things.

Mary’s idea that teachers and books gave you a different outlook on things is not to be confused with Marton’s conception *learning to see things differently* (Marton et al., 1993) where the new views are generated by the learner and/or the learner learns how to see things in different ways.

For Mary, learning involved absorbing new knowledge over a period of time. The results of learning were recognised when things could be automatically accomplished faster and better. This included solving a problem more effectively:

Mary: Yes, and it is like um especially when you are using it and you don't realise that you are, it is like all of a sudden that you know something, or you can have the answer for something, or you can problem solve or whatever.

How the knowledge was 'absorbed' was not at all clear. When asked what she does in order to learn something well, Mary replied, "everything, pretty much." She proceeded to name a range of activities: thus textbooks are read and notes are taken, videos are watched and things are talked about, as though this is self-explanatory. However, she did hint that some sort of mental activity was required and some sense needed to be made for the information to get absorbed, although she did not elaborate on what was being thought about or how it was thought about:

Mary: ...in the beginning you'd probably, you know, be stopping to study and think and kind of grasp whatever it is that has been taught to you or shown to you.

For Mary, learning something really well involved 'reviewing and studying'. Learning happened because certain activities, which include reading, discussing, reviewing work and practice questions, were carried out by the learner. Mary explained:

Mary: Yeah what it was, is just going back over, um, the material that you have already done, all the different essays and assignments, whatever it's just um, what would they call it, review. Just review of everything. Um even so much as getting someone to read something, questions and things like that, that you might think would be involved and trying to answer it without looking at it, so a lot of study I would say.

In summary, Mary's conception of learning involved the absorption of information resulting in an increase in knowledge through studying and thinking. In common with the descriptions given by other participants, there was no elaboration on what studying and thinking involve. Once things were absorbed, they could be done

automatically. Mary strongly identified the conception *learning is an increase in knowledge* identified by Marton et al. (1993) where:

Learning is not dealt with from the point of view of using what has been learned, although future use may be mentioned. (p. 286)

Of interest was the specific reference to learning to see things differently. Mary referred to being taught a different way of seeing a specific phenomenon. This is different from the processes identified by Marton et al. (1993) that involve constructing a different view of something and learning to see things differently and are linked to a higher conception of learning.

These four interviews described above were similar in the emphasis on the accumulation of knowledge rather than making sense of the learning material, and in the lack of explanation about how learning happens. It is as though what was involved in reading, studying, researching, and other study activities was self-evident, except in John's case where he specifically focused on memorisation and recall to describe learning.

The next five participants identified conceptions that focused on understanding meaning. Marton et al. (1997) usefully distinguish between understanding the meaning of the material being presented and understanding the meaning of the phenomenon to which it refers. Three of the participants focused on understanding meaning of the material and two on understanding the phenomenon to which the material refers.

Vivian: (i) Learning is becoming empowered (by learning the 'proper way' to do things), and (ii) learning is understanding the meaning of what is being taught by doing study activities.

Vivian was a 48-year-old woman who reached Year Seven of formal schooling and studied at TAFE three years ago. Vivian clearly identified two conceptions of learning. The main focus in her interview was that learning was becoming empowered. This empowerment came from understanding the sense of what is being taught.

The focus of the learning experience for Vivian was empowerment rather than cognition. In other words, empowerment was not only her reason for studying, but also her actual experience of learning. It is as though this was more important than the cognitive experience of learning. For example, in answer to what learning at university would be like, she replied:

Vivian: It is just opening doors for me ... I need to be able to read everything easily and I need to be able to spell. Reading and spelling is the two things that is my weakness and holds me up. Everything else I can do.

She referred to needing to know things and wanting the confidence from knowing.

The results of learning again reflected the empowering experience of learning:

Int: What does it mean when you've learnt it?
Vivian: I achieved something.

Also linked with *learning as empowering* was learning the right way of doing something. When talking about studying Aboriginal writing, Vivian said:

Vivian: I'm learning to actually understand the actual people and the, how they write ... because you just don't write, there's a way of doing it, a proper way of doing it.

The very strong emphasis on learning as empowering was associated with the second conception identified by Vivian: *learning as understanding meaning*. Vivian explained:

Vivian: I need to understand what I am doing. It is important for me to understand what I am writing and what I am talking about and what I am doing, otherwise it is just, it is senseless not doing it.

This correct way of doing something was learnt by doing it and getting comments from someone who knew more about it:

Vivian: There's a way of doing it and not just doing it my way, which may not be the right way but I'm learning how to do things right. It's like when you're a mother and you're teaching your kids how to grow up, and when they're doing things, you know you've always got someone there a bit higher than you teaching you.

It follows that learning happened for Vivian by doing the tasks set by the teacher and through the feedback from the teacher:

Vivian: By doing it and sending the results, my work to the teachers and then when they correct me and send me back the results then I know I have learnt something.

In order to learn, Vivian read what she had to do and made sure she understood the task. Understanding was important because this aided memory:

Vivian: I want to understand what I am doing here. Not just to be having a, you know, just fumbling your way through it and then not remembering a week later of how that was done.

Understanding happened by going over the same thing repeatedly until it was absorbed:

Vivian: If I read a book and I think 'I don't understand that', so I'll start again and I read the book and that page over and over again and I'll turn back to the next paragraph until it sinks into my head.

Vivian did not talk in depth about how learning happens. In order to learn something well, she would "do it really well" emphasising again that the 'doing it' is what mattered:

- Int: How do you do it really well? What do you do so you do a good job?
Vivian: I don't really know. I think when I am satisfied with it, that I've done a good job. I keep on doing it 'til I get it right.

There was an indication here of a sense of agency in her own learning: it was not just the teacher who has to be satisfied, Vivian was also making evaluative decisions about whether she was "doing it really well" and "getting it right". For example, in order to prepare for an essay, she would read so that she could retell what she had read:

- Vivian: Go to the library and read several books, not just one.

And I would find out. I'd get books on Aboriginal history and read them and most probably write my bit.

I would learn and study it and get all the data and everything I need on that subject or whatever it is until I think I've got it right. And I will keep on going and going and going

Knowing something meant that it was understood, as these excerpts illustrate:

- Vivian: What's the point in having an answer to something if you don't understand it?

Yes, oh yes definitely, you have to understand.

So whilst Vivian was definite that learning was about understanding, and that learning without understanding was 'senseless', she implied that the understanding could be absorbed from repeatedly doing tasks set by the teacher. This suggests that for Vivian understanding really meant memorising the meaning rather than creating her own understanding.

In summary, for Vivian *learning is primarily an empowering experience*. Learning involved learning to do something the 'right way' because knowing the 'right way' implied some sort of privilege. She saw herself as an agent in her own learning, making decisions about when a task is completed satisfactorily. Whilst Vivian

described learning without understanding as being 'senseless', her description of how to learn involved repeatedly doing tasks set by the teacher. Therefore, it seems that although Vivian defined learning as understanding, the way she experienced learning as happening is similar to an accumulative conception, suggesting that learning was, in fact, memorising the meaning of the material being taught. For Vivian there was a discontinuity between the focus on meaning in her conception of what learning is and a reliance on doing various study activities in an unreflective manner.

George: Learning is understanding the meaning of what is being taught through thinking about the material and trying to understand it. Learning results in empowerment.

George was 46 years old and last studied 15 years ago. At school, he reached Year Seven. For the previous ten years he had been employed and had attended a number of training courses. For George, in order to learn, he had to understand the material:

George: It's involved with understanding, you need to understand how it works, to arrive at an answer, particularly Maths.

And if something had been learnt it had been understood:

George: When you've learnt something, you know it, you feel confident straight away that 'that's it'.

And if he could not understand the work, he would ask questions:

George: By asking the questions, I would hope to find answers or find a way to be able to understand it.

Learning involved getting more knowledge, and this knowledge had to be related to existing knowledge. George talked of building blocks and learning things systematically:

George: If you need to learn something, you've got to look for the beginning, start at the beginning or the lowest point and then work your way up.

Int: Why do you have to do that?

George: Well it's no good starting at the end, some people try to, but that's difficult I believe it is easier to start at the beginning and work step by step and go through it.

Int: So you go sort of step by step building up each time.

George: It's like building a house, start from bottom - it's no good starting at the top, there's nothing to hold the roof up [chuckle].

Tutors were very important because if they were effective, they structured the material and taught George "the procedures and how to get answers". According to George, learning with understanding was better than learning by rote:

George: If you really want to learn something really well, yes I think you need to understand it. You can learn it in parrot-fashion and not have any understanding of it.

George did not elaborate on how this understanding developed, other than simply by going through it in a logical way, suggesting that it was reconstructed by him in his head.

George identified a second conception: learning as empowering. By learning, he would improve his education. He talked about how in some families everybody seemed to study:

George: It's like a message is passed on.
Int: What's the message?
George: Well the message for us is if you want to get somewhere further in life, to study. You can improve a lot. It's not only useful for job skills and getting jobs, it will improve your confidence in just talking to people and making friends. It makes an impact on your whole life.

This empowering aspect was also evident when George talked about the results of learning:

George: When you've learnt something, you know it, you feel confident straight away that 'that's it'.

And finally at the end of the interview:

Int: Is there anything else you want to say about learning?
George: All I can say is learning is exciting and it's a challenge and it's a whole lot of questions and people will learn if they ask questions and that's what I keep telling young people. You'll learn if you ask questions, if you don't ask a question, you will never know until you ask that question.
Int: You'll never know will you, that's exactly it!
George: Learning is a whole bunch of questions these people need to ask, particularly to the people who know.

To summarise, George identified two conceptions of learning: *Learning is understanding meaning* and *learning is empowering*. Marton et al. (1997) in describing the conception *learning is understanding meaning*, state that:

Remembering is mostly taken for granted and it is the act or the possession of understanding which is emphasised. (p. 32)

For George, learning was about understanding the meaning of things so that the learning could be applied. It involved him constructing that meaning or sense in a logical way with the help of a teacher. However, learning was also experienced as empowering and this is similar to the conception that Meyer (1997) describes in a study with Black South Africans:

The conception has nothing to do with ‘gaining more knowledge’ in any conventional sense, and although it refers to internal growth, it does not reflect any stage [in] a neat hierarchical progression of increasingly sophisticated conceptions of learning. (p. 488)

The way in which George described this empowering aspect of learning as something his people need to do suggested he saw it as a result of learning rather than as part of experience of learning.

Stephanie: Learning is understanding the meaning of what is being taught through thinking about the material and trying to understand it. It results in seeing things differently.

Stephanie was a 23-year-old woman who left school in Year Nine. She last studied a general studies course four years ago at TAFE. Stephanie identified two different conceptions. In describing what learning is, she strongly focused on *learning as understanding meaning*, but, when talking about the outcome of learning, there was evidence of the conception *learning is seeing things differently*. She said learning was:

Steph: Gaining more knowledge.
Int: What does that mean?

- Steph: Like, um, I don't know, but um like, you choose what you want to learn about and, um, you might know a little bit, but it expands your knowledge about the subject, so, um, or you could learn something completely new.
- Int: Yeah.
- Steph: Or um like, you might have a thought about something and then you could learn it and that would change your whole idea of it, of the subject, of what you thought of something before.

This is congruent with the ‘what’ aspect of the conception *learning is seeing something in a different way* where “the learner is changing his or her way of thinking about something” (Marton et al., 1993, p. 290). Unlike Mary, Stephanie was not learning a different way of seeing things, but actively changing her own construction of the phenomenon. She also clearly described the components of learning as some existing knowledge of a phenomenon, something to be learnt, relationships between what the learner already knows and what is being learnt which causes the learner to reconstruct his or her conception of the phenomenon. She was describing the ‘how’ aspect which Marton et al. (1993) found quite rarely: “if we have more knowledge (facts) about a phenomenon, it will appear different to us” (p. 291).

Learning as seeing things differently refers to the application of the results of learning. When Stephanie talked about the acquisition phase of learning she focused on making meanings and explanation, identifying the conception *learning as understanding meaning*. Stephanie clearly explained that when she was learning she was trying to understand:

- Steph: Far out! What do I do to learn? I listen carefully I make sure I get it right, so I can understand it, um far out! I suppose I go over it and over it so I can explain it to myself so that I've got a greater understanding. If I don't understand it then I don't learn anything?

And when asked to talk more about understanding she said:

- Steph: Yeah, um, if I'm going to have to learn something or I want to learn something and understand it completely I'd have to, if they're using big words or whatever, to explain it, I'd have to make sure I could understand everything they're saying. Yeah.
- Int: How do you go about that understanding?

Steph: I'll either write it down and if there's anything I can't understand I'll ask about it, or I might put a thought in my head and think it over and over until I get it right. Or I'll discuss it.

When asked whether she had to think about things on her TAFE course, her reply indicated an awareness of increasing complexity rather than increasing quantity:

Steph: Yes, but not too great. Like when you did a project at TAFE like it was pretty standard, but I think university will go into it a bit more. Into more depth.

Her discussion of how learning happens suggested there was a transition from focusing on the words to focusing on the meaning: that is she had to understand the signs before she could go on to understand the meaning. Understanding came about through thinking with the intention of understanding.

In summary, for Stephanie, the 'what' aspect of learning equated with the conception *Learning as understanding meaning* discussed by Marton et al. (1997). For Stephanie this resulted in *seeing things in a different way*. Learning happened through thinking about things with the intention of understanding them. For Stephanie, like George, the 'what' and 'how' aspects appear congruent.

The next two case studies focused on learning as interpreting new knowledge and relating it to existing knowledge. This involved a construction of personal knowledge and contrasts with the previous two participants who focused on understanding the meaning of what is being taught through a re-construction and ownership of the explanation presented.

Carmen: Learning is understanding the phenomenon that is being referred to in the learning materials (i) by doing study activities, (ii) through thinking about the material and trying to understand it, and (iii) through maturation and experience. It results in seeing things differently and being empowered.

Carmen was a 29-year-old woman who last studied 10 years ago by correspondence in Year 11. Of all the participants, Carmen, coming from a remote community, had the most connection with traditional Indigenous culture. Many other women in her family had studied successfully at university. For Carmen, learning was seeing things differently and this happened through thinking deeply:

Carmen: Gaining more knowledge, and I guess having a different view of things ... when we come in to a place like uni and doing Aboriginal Cultural Studies you have to think deeper and in a more logical way of explaining what is our culture, what it means to us as an individual and in society, and I guess, our identity as well.

Carmen: And then when we come into uni. it's, well, a wider, a more, a wider, a bigger knowledge where you have to really think and explain yourself, where you are coming from and what you are learning and putting it down on paper.

Thinking deeply was combined with experience, maturation, and education suggesting a developmental aspect:

Carmen: When you are older, and, I guess you mature, you see things differently from when you are at school.

This 'seeing things differently' referred to being able to see things from different perspectives. For example, when talking about being a teacher to her children she explained:

Carmen: And I can be a good teacher to my children, and their children's children after that. They can see things through a woman's point of view, as a mother point of view, as a parent, and as a friend. So I hope that the relationship I have with my children, they see it in those views and respect me for those views.

There was also a sense of personal empowerment through education and understanding of the dominant culture:

Carmen: I think if you are older and mature, you can beat people through education and, you know, being stronger in education.

Carmen: Myself, I can see two points of view: one it's teaching you to be more independent with society and with White man's education and White man's way, you know everything designed the White man way, as we would say it. Everything is um, you know, is read through the signs.

Unlike any of the previous conceptions, this conception is located in the 'real' world and not the study situation. It is holistic:

Carmen: You always talk about your past. Past experience gives, I mean, you learn from your past to make a future learning more better, more understandable. If you can understand the past, what is in the present and the future will be easier to understand, in learning.

Carmen also mentioned understanding as being important in knowing whether something has been learnt.

Carmen: We read it, if we understand it and we can write an answer to it, then we have learnt something.

In terms of how learning happens, Carmen was unlike the other participants in referring to both memorising and understanding with equal emphasis. The way she talked about memorising seemed very naïve compared to her conception of what learning is, but she also talked about explaining and putting her own thoughts, "that memory", down on paper, and about interpretation and developing her own understanding whilst taking notes:

Carmen: You are always gotta be a good listener.

Int: What are you doing when you are listening?

Carmen: You are putting everything, I guess, in your memory, in your brain, in your memory box, trying to memorise, dictate, everything that is being taught or said to you.

Carmen: So you might write pictures as your notes, while it's being said to you, you're putting that memory down as picture in your thoughts or on paper. A lot of ways of explaining what you mean and that, is done by examples.

Carmen: OK, listen, take notes, good note taking, to your understanding, and how you understand a lecture.

Carmen's conceptions of what learning is and how it happened were difficult to categorise. On the one hand, she seemed to have a fairly deep conception of what learning was. She described learning as looking into the material, relating to prior

knowledge, being aware of multiple perspectives, and forming an opinion.

Knowledge was regarded as holistic and relational. She expected to have to think deeply and be able to explain her ideas, suggesting she viewed learning as going beyond the text to the meaning of the phenomenon.

On the other hand, she described learning as though it happened almost automatically through experience, whether it is life experience, or the experience of listening, reading, doing research and thinking deeply about things. This was similar to participants with accumulative conceptions of what learning is. Carmen did not convincingly describe a learning process that looked into the material, related it to prior knowledge, and took account of multiple perspectives. However, English is not Carmen's first language and this may have confounded the analysis of her interview data.

In summary, Carmen's conception of what learning is seemed to arise from her own maturity and life experiences. She identified *learning as understanding phenomena* and the results of learning as *seeing things differently and empowering*. In regarding learning as coming to see things differently, she was describing the relatively deep, meaning-oriented conception of learning identified by Marton et al. (1993). She described learning as happening by memorising, thinking, and understanding and through maturation, but she did not explain how.

Kelly: Learning is understanding the phenomenon that is being referred to in the learning materials through linking new information to existing information in a meaningful way.

Kelly was 20 years old and planning to study on campus. She previously studied three years ago when she completed Year Ten at High School. A number of significant older women in her family had studied at a mature age.

For Kelly, learning was quite simply “gaining more knowledge” and knowledge was about understanding the meanings of things:

- Kelly: Just knowing different things and I don't know, I have always liked to meet different people and to know what they know.
- Kelly: I like learning, I like to know the meanings of things and why is it so.

Kelly talked a lot more about how learning happens than other participants. She said that learning was essentially done through “absorbing things”, but this ‘absorption’ required activity on the student’s part. For example, she did not like missing a class because “only you can interpret and learn from yourself”.

This learning involved making links between what was already known and the new information:

- Kelly: Knowing what you already know in your head and gathering more information and putting that in your own words in your own mind and I learn more like that.

Learning something well meant understanding it, and understanding meant:

- Kelly: If you can clearly think and know what has been put into your head.

Kelly had a particular strategy for when she didn’t understand something:

- Kelly: If I don't understand something, just understand why I don't understand it and answer the question behind it to find out the answer.

More specifically, to prepare for a test she would “study, revise”. This meant:

- Kelly: Just going over notes, reading books. Making my own questions and then finding some way of answering them.

Kelly explained that when you are learning, “you are storing, you are memorising” but it is clear that these occur after understanding.

There were two tests of learning for Kelly. The first is whether she believed she had developed the understanding being taught, and the second was through more formal assessment:

Kelly: Not just reading and writing everything out of that book, but just interpreting things in my own way and to the best of my ability to what I know.

Kelly: How do I know? When I know, I can answer and be confident that I know the answer of it.

In summary, Kelly identified a conception similar to *learning as understanding phenomena* described by Marton et al. (1997). That is, she was trying to understand at a deeper level than simply understanding the meaning of what was presented. In terms of the referential meaning, Kelly looked into the material to see how it fitted with existing ideas, and she looked at the material as a whole. It should be noted that Kelly was the only participant in the study who identified a meaning-focused conception and was also able to explain how she thought about things.

Summary Of Conceptions Identified In The Interviews

A number of conceptions were identified in the interviews. These have been grouped into conceptions of what learning is, conceptions of the result of learning, and conceptions of how learning happens, and are described below. A table showing a mapping of the conceptions identified by the nine participants onto the framework described by Marton et al. (1993) is available in Appendix D.

Conceptions Of What Learning Is

Conceptions of what learning is refer to the knowing phase in the acquire-know-apply sequence described by Marton et al. (1997). Three different conceptions of what learning is were identified in the interviews. Conception W1 referred to knowledge as discrete and factual with a correct answer or correct way of doing things. In addition, memorisation was emphasised more than understanding. In contrast, in conceptions W2 and W3 knowledge was regarded as meaningful and the meaning needed to be discerned through a process of understanding.

W1 Learning is increasing one's knowledge.

The four participants who identified this conception (Rhonda, Josey, John, and Mary) saw learning as a straightforward increase in factual and discrete knowledge. This conception has been identified by Marton, Dall'Alba and Beaty (1993). The 'taken-for-grantedness' was typical of this conception.

W2 Learning is understanding the meaning of what is being taught.

The three participants who identified this conception (Vivian, George, and Stephanie) focused on the need to understand what was being taught and spoke of the senselessness of simply memorising. There was a belief that understanding lead to better memorising. Marton, Watkins, and Tang (1997) have described this conception.

W3 Learning is understanding the phenomenon that is being referred to in the learning materials.

The two participants who identified this conception (Carmen and Kelly) spoke of the need to understand how things fit together and relate to prior knowledge. This conception has also been described by Marton et al. (1997).

Conceptions Of The Results Of Learning

The next four conceptions concerned the outcomes of learning. They represent the application of learning in the temporal acquire-know-apply sequence described by Marton et al. (1997).

R1 Learning is being able to do new things.

In this conception the focus was on the application of what has been learnt. It was associated with learning as an increase in knowledge and identified by five participants (Rhonda, Josey, John, Mary and Vivian).

R2 *Learning is becoming empowered.*

Participants identifying this conception focused on the empowering experience that resulted from having learned something. It was associated with the idea that the knowledge itself was empowering (knowing 'the proper way', 'White man's way'). It was not necessarily associated with empowered thinking or reasoning abilities. It was similar to the conception identified by Meyer (1997), and was identified by Vivian, George and Carmen.

R3 *Learning is seeing things differently.*

Three forms of this conception were identified. Stephanie and Carmen described the two forms previously described by Marton et al. (1993) as *learning is seeing something in a different way* where “the learner is changing his or her way of thinking about something” (p. 290). For Stephanie and Carmen, the conception *seeing something in a different way* was associated with meaning-orientated conceptions. But whereas for Stephanie it meant learning a new (second) way of seeing something familiar, for Carmen it meant coming to see things from a range of perspectives. The third form of this conception was identified by Mary. It was associated with an accumulative conception of learning, that is, a different way to see something familiar was taken in.

R4 *Learning is to know the meaning of things and why it is so.*

The focus in this conception was being able to interpret and explain phenomena. The conception was associated with learning as understanding the phenomenon referred to in the learning material. One participant, Kelly, identified this conception.

Conceptions Of How Learning Happens

Whilst the descriptions of what learning is can be recognised in the existing literature, this is not so for the descriptions of how learning happens. Five different

conceptions of how learning happens were identified. Generally the conceptions of how learning happens seem undeveloped. Five of the nine participants (Rhonda, Josey, John, Mary and Vivian) did not appear to have any awareness of how to study, other than by 'doing the tasks the teacher sets'. According to Marton et al. (1997), this vagueness is typical of the conception *learning is an increase in quantitative knowledge*.

With the exception of Carmen, each participant identified only one way that learning happens. Carmen emphasised memorising, experiencing, and understanding (H2, H3, and H4). The participants who identified *learning as understanding* also identified the results of learning as *becoming empowered* and/or *seeing things differently*.

H1 Learning happens automatically by physically doing a set task.

This very naïve view of learning, identified by Rhonda, is similar to the one identified in young children by Pramling (1983), where learning was simply a consequence of doing correctly the activities required by the teacher. The teacher's role was therefore paramount in whether or not learning happens and there was no indication of any reflection on learning. The paradoxical and most dominating characteristic of this conception was the 'taken-for-granted' nature of learning, its self-evident obviousness, when the last thing that was obvious was the nature of learning. The results of learning were being able to do something, which was often a piece of assessment. This conception was distinguished from the others by the undifferentiated view of learning and doing: they are one and the same things.

H2 Learning happens by doing study activities such as studying, reading, note-taking, doing research, memorising.

This was most common conception of how learning occurred and was identified by four participants (Josey, John, Mary and Vivian). Whilst the teacher still has an important role in this conception in devising appropriate learning tasks, the learner

also has to do some independent work such as read, study, research or take notes. Participants identifying this conception named generic activities associated with studying, but did not explain what was involved in doing these tasks or how they went about them. It was as though what they did when they read or how they selected important information was self-evident. They indicated little awareness of their own learning: the task was simply to 'learn it'. Participants with this conception attempted to memorise the meaning of what was being taught by grasping or absorbing it. Purdie (1994) identified a similar conception in her study.

H3 Learning happens through maturation and experience.

Carmen suggested that learning was a developmental process: because you were older, you were more mature and have had a wide variety of experiences, therefore you were wiser. This was associated with a holistic view of knowledge. This conception explained why learning happens, but not how. It was associated with the conception H4 below.

H4 Learning happens through thinking about the material and trying to understand it.

The three participants (Stephanie, George and Carmen) who identified this conception of how learning happens were trying to understand the meaning of the material being presented. Trying to understand meant making sense. Listening was important and they expected to be able to re-explain or use the material if they understood it. There was no reference to linking the information to other information: it was as though what is presented is self-contained.

Marton et al. (1997) distinguished between memorising meaning and understanding meaning. These participants did not talk about memorising the meaning so much as 'getting the meaning'. That is, they were aware that there was a meaning to be discerned but they did not elaborate on how they would discern it. Most frequently,

the participants simply suggested that this came about through going over and over the material repeatedly, or going over the material step by step to follow the logic.

The lack of elaboration of how they would 'think' and 'try and understand' was similar to the lack of explanation of how learning happened in the conception *H2 learning happens through doing study activities such as reading, note-taking, doing research and memorising*. Perhaps those participants trying to 'think' and 'understand' were simply quoting from a more extensive list of generic skills. If this were the case, they may not know how to go about trying to understand.

H5 Learning happens through linking new information to existing knowledge in a meaningful way.

Only Kelly explained how learning happened in terms of working with existing knowledge and new knowledge to synthesise new meanings. As she explained, learning was "not just reading and writing, but interpreting".

Summary Of Findings

A summary of the conceptions identified in each case study is presented in Table 9. The participants identified conceptions of what learning is that have been described in the literature, (i.e., *learning is an increase in knowledge, learning is understanding the meaning, learning is understanding the phenomenon*). These conceptions, however, were often not associated with convincing explanations of how learning happens. Participants who saw learning as an increase in knowledge named various activities associated with study, but did not indicate an awareness of effective ways of doing the activity. Participants who indicated that learning was about understanding spoke of thinking and trying to understand. It is possible that they too were naming activities without an appreciation of effective ways of trying to find meaning.

Table 9. Summary Of Conceptions Identified In The Case Studies.

Case Study	Learning is ...	Learning happens ...	Learning results in ...
Rhonda	Increasing one's knowledge.	Automatically by physically doing a set task.	Being able to do new things.
Josey	Increasing one's knowledge.	By doing study activities.	Being able to do new things.
John	Increasing one's knowledge.	By doing study activities, specifically repetition and practice.	Being able to do new things.
Mary	Increasing one's knowledge.	By doing study activities.	Being able to do new things.
Vivian	(i) becoming empowered. (ii) understanding the meaning of what is being taught.	(i) by learning the 'proper way' to do things. (ii) by doing study activities.	(i) empowerment. (ii) being able to do new things.
George	Understanding the meaning of what is being taught.	Through thinking about the material and trying to understand it.	Empowerment.
Stephanie	Understanding the meaning of what is being taught.	Through thinking about the material and trying to understand it.	Seeing things differently.
Carmen	Understanding the phenomenon that is being referred to in the learning materials.	(i) by doing study activities (ii) through thinking about the material and trying to understand it (iii) through maturation and experience.	Seeing things differently and being empowered.
Kelly	Understanding the phenomenon that is being referred to in the learning materials.	Through linking new information to existing information in a meaningful way.	Knowing the meanings of things and why it is so.

Two participants had more obvious discontinuities between what they thought learning was and how it happens. One, Vivian, expressed a meaning-focused conception of what learning is but did not describe the process of learning as one of making meaning. Instead she named typical study activities and did not elaborate on any associated mental activity. The other participant, Carmen, described learning as understanding phenomena, but her description of how learning happens was more likely to result in understanding the meaning than the phenomenon. In the latter case, this may have been due to English not being the first language.

In Figure 2 the conceptions identified by each participant have been mapped. This clearly shows the overlap and the relationships between the conceptions of what learning is, the results of learning and how it happens. Analyses of these conceptions using the conceptual framework from Marton et al. (1993) are found in Appendices D and E. Appendix D presents an analysis of the conceptions by case study showing the referential meanings and structural aspects (internal and external horizons) of the 'what' and 'how' of each conception. Appendix E presents a similar analysis by conception rather than case study.

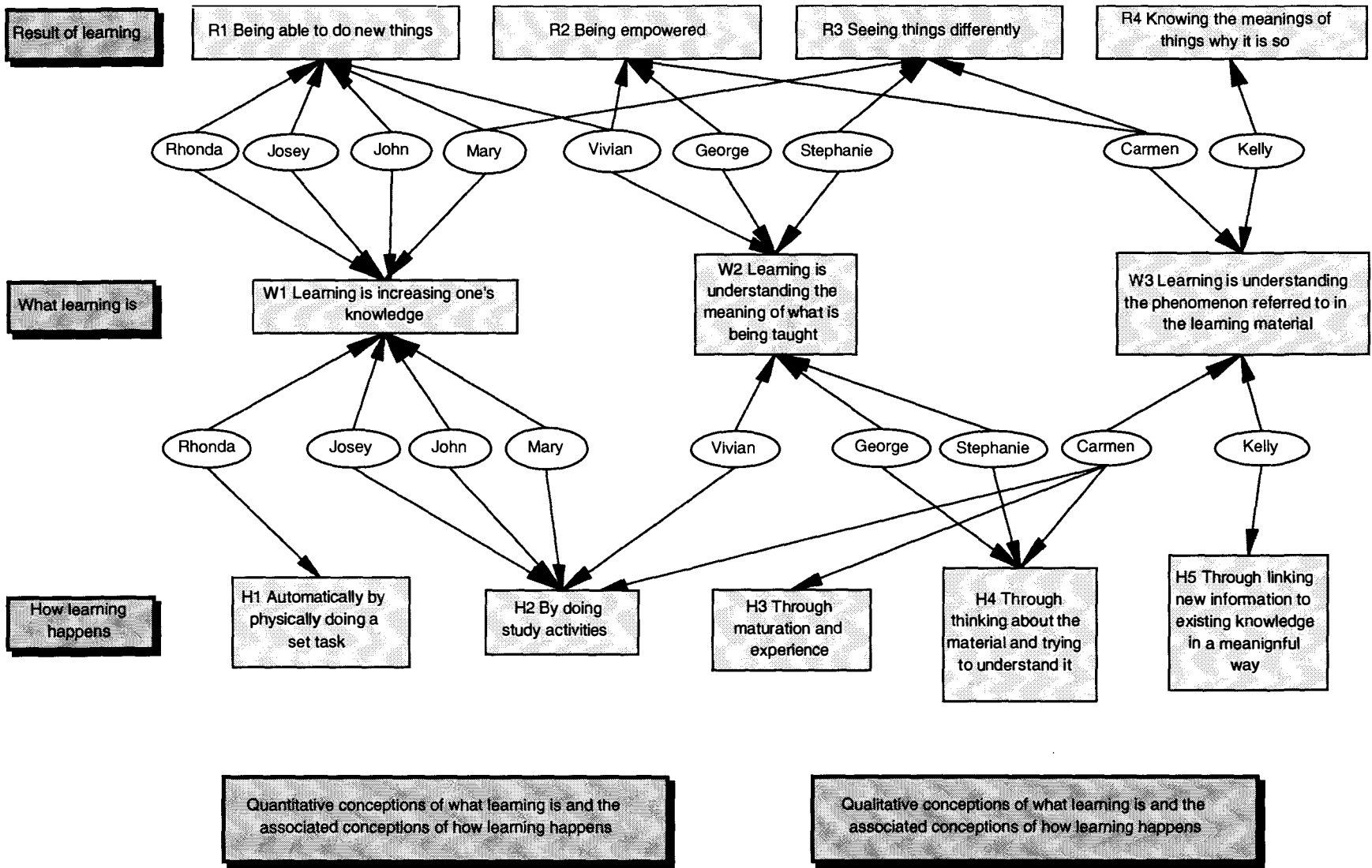


Figure 2. The relationships between what learning is, how learning happens, and the results of learning.

CHAPTER SEVEN

ANALYSIS OF THE INVENTORY

Introduction

This chapter begins with an initial consideration of how the scales used in the Reflections on Learning Inventory (RoLI), (see Appendix A), might relate to various conceptions of learning. Following this, there is an analysis of the match between the interview data and RoLI profile for each interview participant. The final section looks at the inventory data for the whole sample (the 36 students who returned the questionnaire), and briefly describes some emerging patterns.

Matching The Interview Analysis To The Individual RoLI Profiles.

The Reflection on Learning Inventory has ten scales. Three scales refer to conceptions of what learning is, two refer to conceptions of knowing, one refers to how learning happens, a further scale refers to a conception of knowledge, one scale refers to a duty dimension in learning, and the remaining two scales refer to the relationship between understanding and memory. The scales can also be considered in terms of whether they reflect an accumulative or meaning-oriented conception of learning. These relationships are presented in Table 10.

Table 11 shows the expected associations between the conceptions identified in the interviews and RoLI scale endorsements. The accumulative conception *W1 Learning is an increase in knowledge* identified in the interviews was expected to be associated with endorsement of the four accumulative scales *Knowledge is discrete and factual*, *Learning is accumulating factual knowledge*, *Learning is collecting facts* and *Knowing is recalling information*. Similarly, the conceptions *H1 Learning happens automatically by physically doing a set task* and *H2 Learning happens by doing study activities such as studying, reading, note-taking, doing research*,

memorising would also be expected to be associated with endorsement of these scales.

Table 10. The RoLI Scales.

Scale	Abbr.	Accumulative or meaning-oriented	What scale refers to
<i>Learning conceived as an increase in knowledge.</i>	<i>LINC</i>	Accumulative or generic	A conception of what learning is.
<i>Knowledge conceived as discrete and factual.</i>	<i>KFAC</i>	Accumulative	A conception of knowledge.
<i>Learning conceived as accumulating factual knowledge.</i>	<i>LACC</i>		A conception of what learning is.
<i>Learning is conceived as collecting facts.</i>	<i>LFAC</i>		A conception of how learning happens.
<i>Knowing conceived as recalling information.</i>	<i>KREC</i>		A conception of knowing.
<i>Learning conceived as seeing things differently.</i>	<i>LDIFF</i>	Meaning-oriented	A conception of what learning is.
<i>Knowing conceived as thinking independently .</i>	<i>KIND</i>		A conception of knowing.
<i>Learning conceived as a duty.</i>	<i>LDUT</i>	Not applicable	An affective aspect of learning.
<i>Memorising occurring before understanding .</i>	<i>MUND</i>	Not applicable	The temporal relationship between memorising and understanding.
<i>Understanding occurring before memorising.</i>	<i>UMEM</i>	Not applicable	

The conceptions W2 *Learning is understanding the meaning of what is being taught*, W3 *Learning is understanding the phenomenon that is being referred to in the learning material* and R4 *Learning is seeing things differently* would be expected to be associated with the meaning-oriented scales *knowing is thinking independently* and *learning is seeing things differently*. Similarly, the meaning-oriented conceptions for how learning happens (i.e., H3 *Learning happens through maturation and experience*, H4 *Learning happens through thinking about the material and trying to*

understand it, and H5 Learning happens through linking new information to existing knowledge in a meaningful way) are expected to be associated with these scales. The scales, LDUT, UMEM and MUND, are not included as these were not part of the planned interview questions.

Table 11. Expected RoLI Scale Endorsements.

Conception identified in the interview analyses	RoLI Scale							
	LINC	KFAC	LACC	LFAC	KREC	LDIFF	KIND	
W1 Learning is an increase in knowledge	✓	✓	✓	✓	✓			
W2 Learning is understanding the meaning of what is being taught	✓					✓	✓	
W3 Learning is understanding the phenomenon that is being referred to in the learning material	✓					✓	✓	
R1 Learning is being able to do new things		[Not reflected in RoLI scales]						
R2 Learning is becoming empowered		[Not reflected in RoLI scales]						
R3 Learning is seeing things differently						✓	✓	
R4 Learning is to know the meanings of things and why it is so						✓	✓	
H1 Learning happens automatically by physically doing a task		✓	✓	✓	✓			
H2 Learning happens by doing study activities etc		✓	✓	✓	✓			
H3 Learning happens through maturation and experience						✓	✓	
H4 Learning happens through thinking about the material and trying to understand it						✓	✓	
H5 Learning happens through linking new information to existing knowledge in a meaningful way						✓	✓	

A RoLI profile for each individual was expected from the conceptions of learning identified in the analyses of the interviews. The actual profile was then compared with this expectation. The individual RoLI profiles for each interview participant are

presented and discussed below. In the profiles, the scales have been arranged with the scale referring to the generic conception *learning is an increase in knowledge* first, followed by scales expected to be associated with an accumulative conception and then those expected to be associated with a meaning-oriented conception. The final three scales in the profiles are *learning is a duty*, *memorising occurs before understanding* and *understanding occurs before memorising* respectively fall outside the accumulative/meaning oriented dichotomy. A score of above 15 indicates endorsement of the scale and less than 15 indicates disagreement; a score of 15 represents neither agreement nor disagreement.

What is most striking about the profiles is the tendency for all scales to be endorsed, with the exception of the scale *knowledge is discrete and factual* and *learning is a duty*. Only four of the nine participants interviewed, regardless of whether they identified accumulative or meaning-oriented conceptions, endorsed the scale *knowledge is discrete and factual*. Only three participants endorsed the scale *learning is a duty*. The endorsement of most scales may represent an acquiescent tendency in the participants.

Rhonda: Learning is increasing one's knowledge automatically by physically doing a set task.

In the interview, Rhonda identified learning as *increasing one's knowledge*, and *learning happens automatically by physically doing a task set by the teacher*. Rhonda talked in such an unelaborated way about learning that there was little in the transcript that could be matched to the RoLI scales except *learning is an increase in knowledge*. None of the other scales relating to learning fitted with Rhonda's espoused conception of learning: she talked about learning as doing, knowing as being able to do and did not talk about understanding or memorising as strategies. Because of this lack of match

between Rhonda's conceptions and the scales in the RoLI profile, it was not possible to anticipate which scales Rhonda would agree with other than *learning is an increase in knowledge*.

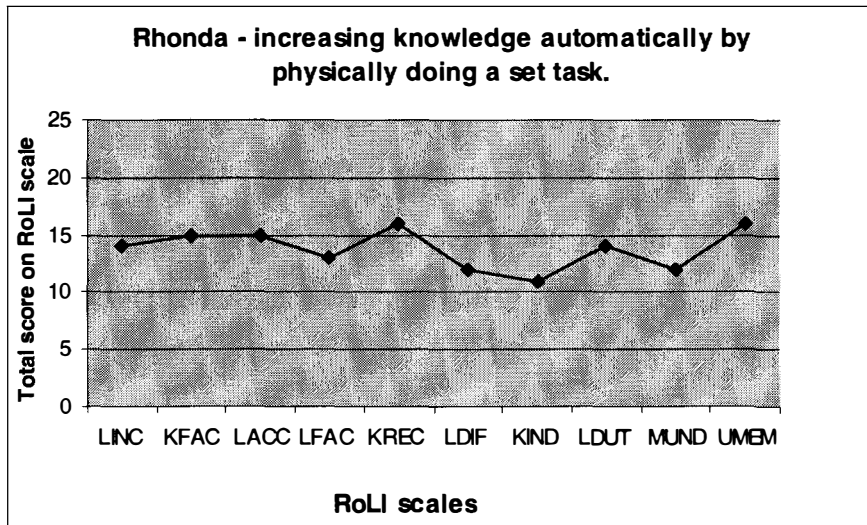


Figure 3. Rhonda's RoLI profile.

Rhonda's RoLI profile is interesting for its marked lack of agreement or disagreement on many of the scales. Closer examination of the individual scoring of the items reveals no consistency. Each of the scales had items with which Rhonda indicated both high and low agreement. This would support the notion developed in the interview analysis that learning is an unreflected activity and no consistent conception of learning is held. It could also suggest that she had difficulty understanding the items in the questionnaire.

Josey, John, and Mary: Learning is increasing one's knowledge by doing study activities.

The next three participants, Josey, John, and Mary, all identified *learning as an increase in knowledge that happens through doing various study activities*.

Associated with this was a belief that knowledge is discrete and factual. Profiles

were expected that indicated endorsement of learning as an increase in factual knowledge (*learning is an increase in knowledge* and *learning is accumulating factual knowledge*) through a process of collecting facts (*learning is collecting facts*) and endorsement of knowledge as factual (*knowledge is discrete and factual*). The profiles were also expected to endorse *knowing as recalling information*. They were not expected to show endorsement of *learning is seeing things differently* and *knowing is thinking independently*. There was no evidence in the interview transcripts to match with the RoLI dimension *learning is a duty*, or with the temporal relationship between understanding and memorising.

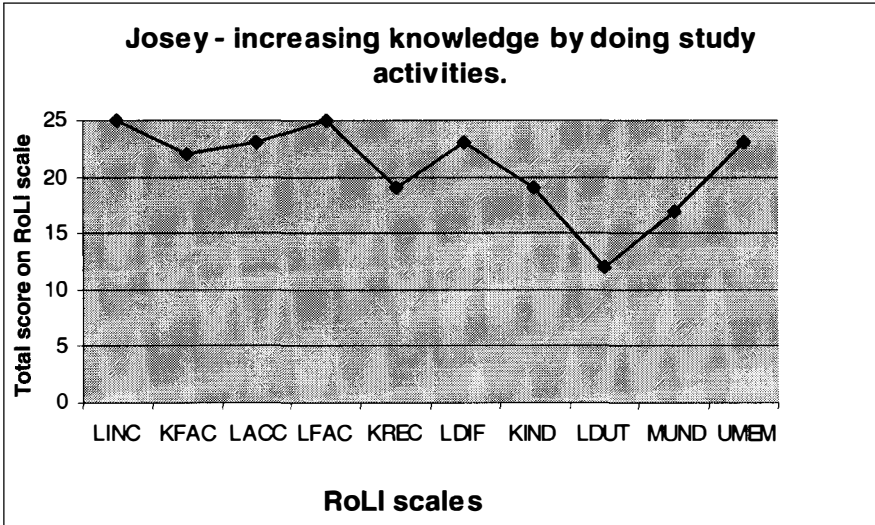


Figure 4. Josey's RoLI profile.

Josey’s RoLI profile was not consistent with her interview. Her RoLI profile indicates agreement with all of the statements except for *learning is a duty*. The agreement with *learning is seeing things differently* and *knowing is thinking independently* was not predictable from her interview, nor inferable from a conception of *learning as an increase in knowledge*.

As expected from the interview data, John (Figure 5) endorsed *learning is an increase in knowledge*, *learning is accumulating factual knowledge* and *knowing is recalling information* and did not endorse *learning is seeing things differently*. Like Josey, he endorsed *knowing is thinking independently*. Unlike Josey, he did not endorse *knowledge is discrete and factual*. Neither response was expected from his interview.

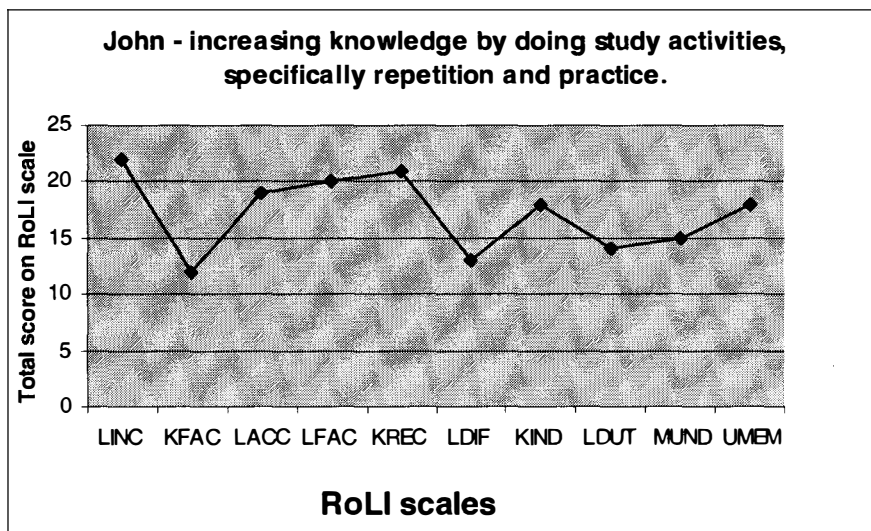


Figure 5. John's RoLI profile.

The expected profile for Mary (Figure 6) was similar to the expected profile for Josey and John, except agreement was expected with *learning is seeing things differently* since Mary mentioned this in her interview. With the exception of the endorsement of *learning is seeing things differently*, Mary's profile is similar to John's including the unexpected non-endorsement of *knowledge is discrete and factual*.

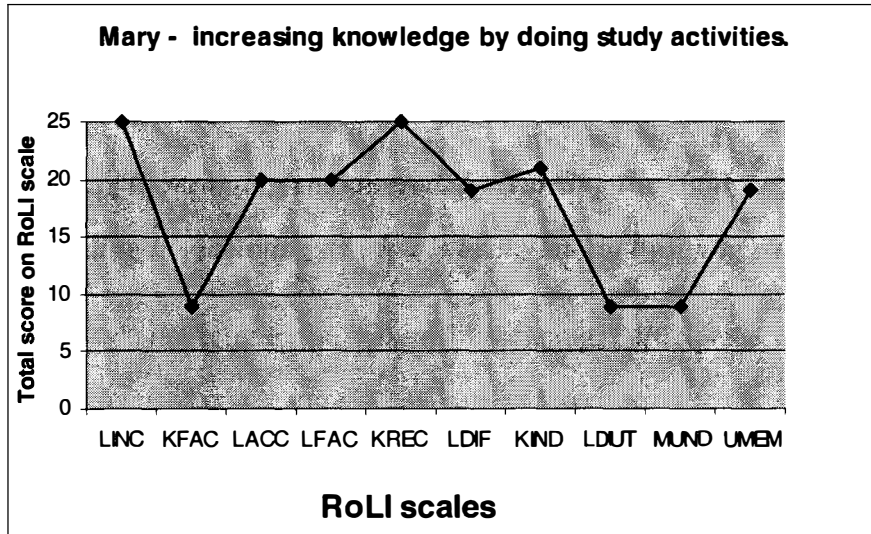


Figure 6. Mary's RoLI profile.

These RoLI profiles for Josey, John and Mary could not have been predicted from the interview data. There was little evidence in the interview transcripts to support endorsement of *knowing is thinking independently*, which was endorsed by each of them. However, there was evidence in the interviews that their conceptions of knowledge included a practical component to knowing, 'knowing how', as well as 'knowing that'. There is no RoLI scale for a conception of knowledge with a practical attribute. It is possible that some of the items in the *knowing is thinking independently* scale have been interpreted as reflecting this practical application of knowledge (e.g., I know I have learned something when I can do something without thinking; I know I have learned something when I can carry out a task without guidance). Similarly, if knowledge is something practical and personal that combines information with skill in applying, then *knowledge is discrete and factual* may not be endorsed, as in John and Mary's cases.

All three participants endorsed *understanding occurs before memorising* more strongly than *memorising occurs before understanding*. This probably reflects the emphasis on understanding noted in the interviews. For Mary this was supported by her explanation in the interview that you have to “think and grasp whatever it is that

has been taught to you”.

Vivian: Learning is becoming empowered (by learning the right way to do things), and understanding the meaning of what is being taught by doing study activities.

The RoLI scales do not refer to the making of meaning. Participants who identified a conception that focused on meaning were expected to endorse the scale *learning is an increase in knowledge* and perhaps the scales *learning is seeing things differently* and *knowing is thinking independently*. They were not expected to endorse the scales *knowledge is discrete and factual*, *learning is accumulating factual knowledge*, *learning is collecting facts* and *knowing is recalling information*. However, since Vivian identified an accumulative 'how' conception inconsistent with her 'what' conception, an ambiguous and incoherent profile, perhaps one where everything is endorsed, was expected.

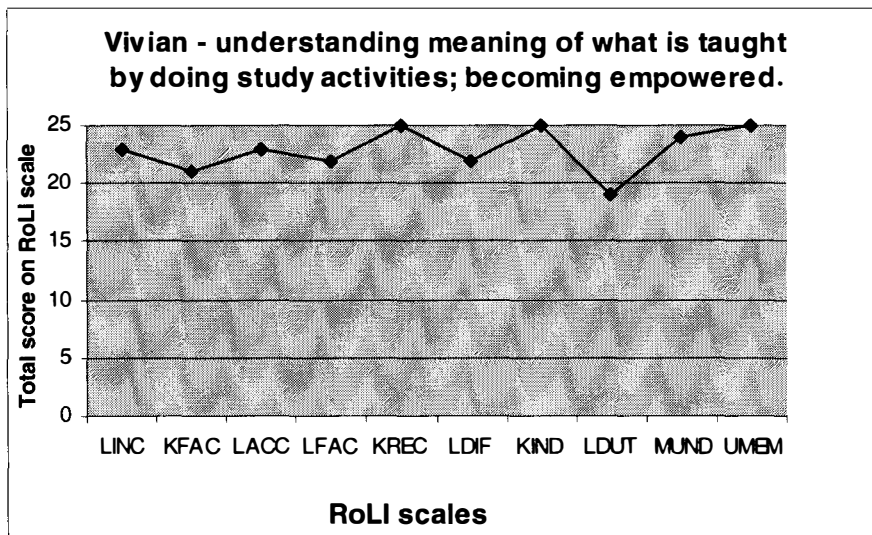


Figure 7. Vivian's RoLI profile.

Vivian's profile is noticeably flat with endorsement of all the scales as predicted. Both *knowing is recalling information* and *knowing is thinking independently* are

endorsed along with *learning is an increase in knowledge*, *learning is accumulating factual knowledge*, *learning is collecting facts*, and *learning is seeing things differently*, suggesting recognition of multiple conceptions. The scale, *learning is a duty*, attracted mixed responses.

Stephanie and George: Learning is understanding the meaning of what is being taught through thinking about the material and trying to understand it.

Stephanie and George identified learning as understanding the meaning of what was being taught through thinking about the material and trying to understand it. Again it was expected that participants who identified a conception focusing on meaning would agree with the scales *learning is an increase in knowledge*, *learning is seeing things differently* and *knowing is thinking independently*. They were not expected to endorse *knowledge is discrete and factual*, *learning is accumulating factual knowledge*, or *learning is collecting facts*.

As expected, George (Figure 8) has endorsed *learning is an increase in knowledge*, *learning is seeing things differently* and *knowing is thinking independently*. But he has also endorsed scales not expected to be associated with a meaning-oriented conception: *learning is accumulating factual knowledge*, *learning is collecting facts*, and *knowing is recalling information*. His profile was not consistent with the interview data.

In the interview, George indicated another conception *learning as empowerment*. There is no scale that reflects learning as empowerment in the RoLI inventory. Interestingly, George has endorsed *learning is a duty*: this may reflect his view that "learning is a whole bunch of questions these people need to ask".

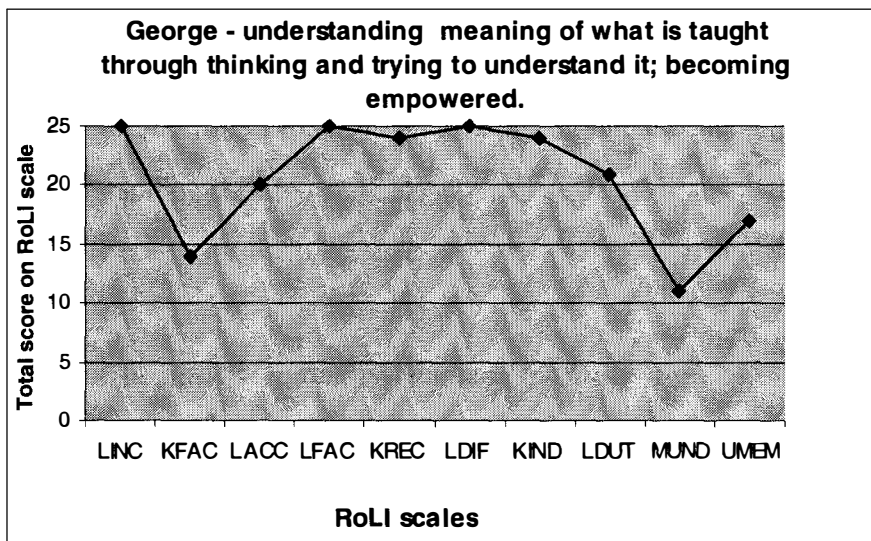


Figure 8. George's RoLI profile

Stephanie's profile (Figure 9) matches the expectations. She has indicated agreement most strongly with *learning is an increase in knowledge, learning is seeing things differently* and *knowing is thinking independently* as predicted from the interview transcript. She has also endorsed *understanding occurs before memorising*. She has not endorsed *knowledge is discrete and factual*.

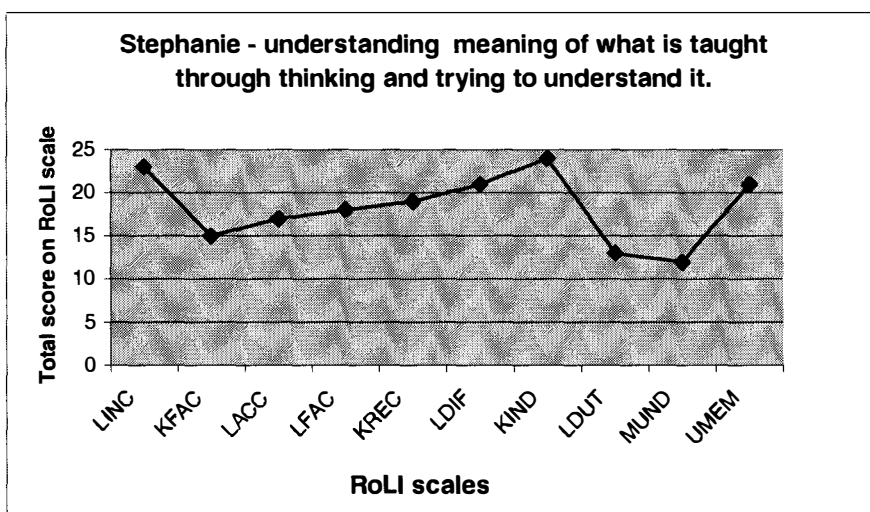


Figure 9. Stephanie's RoLI profile.

In relation to understanding and memorising, George and Stephanie have endorsed *understanding occurs before memorising* and disagreed with *memorising occurs before understanding*. This is expected in a meaning-oriented conception where the focus is on understanding (Marton et al., 1997).

Carmen: Learning is understanding phenomena by doing study activities, through thinking about the material and trying to understand it, and through maturation and experience. It results in seeing things differently and being empowered.

Carmen identified a meaning-oriented conception for what learning is, so endorsement of *learning is seeing things differently* and *knowing is thinking independently*, along with *learning is an increase in knowledge* are expected. But she also identified a complete range of processes for how learning happens, so endorsement of all the scales is expected. Although Carmen identified a conception that learning was empowerment, this was not linked to learning as a duty, about which Carmen explained that for her learning was a choice she was free to make.

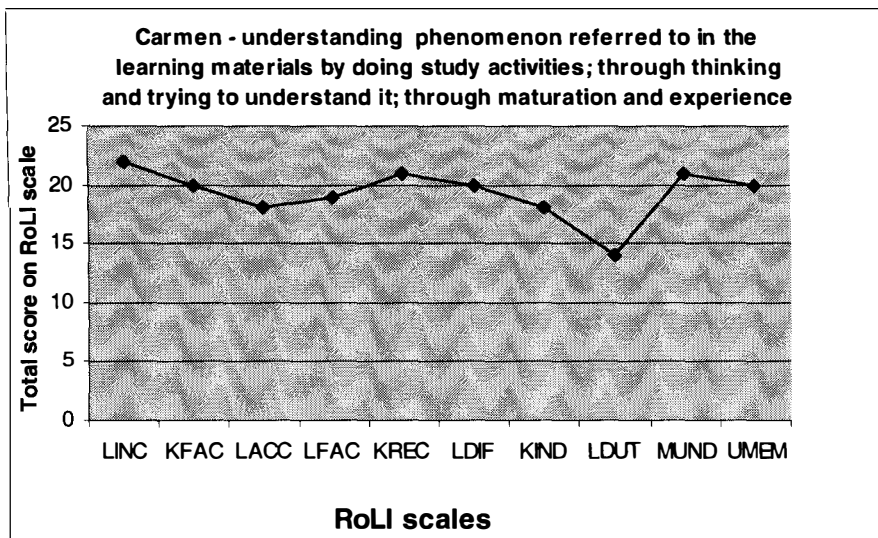


Figure 10. Carmen's RoLI profile.

Consistent with the expectation, Carmen's profile is notably flat with general

endorsement of most scales. The exception is *learning is a duty*. In the interview she explained that for her learning was a choice and not an obligation.

Kelly: Learning is understanding the phenomenon that is being referred to in the learning material through linking new information to existing knowledge in a meaningful way.

As with the previous profiles, a participant who identified a conception that focuses on meaning was expected to agree with the scales *learning is an increase in knowledge*, *learning is seeing things differently*, and *knowing is thinking independently*. Given Kelly's emphasis on understanding the meaning of the phenomenon referred to, she was not expected to endorse *knowledge is discrete and factual*, *learning is accumulating factual knowledge*, *learning is collecting facts* or *knowing is recalling information*.

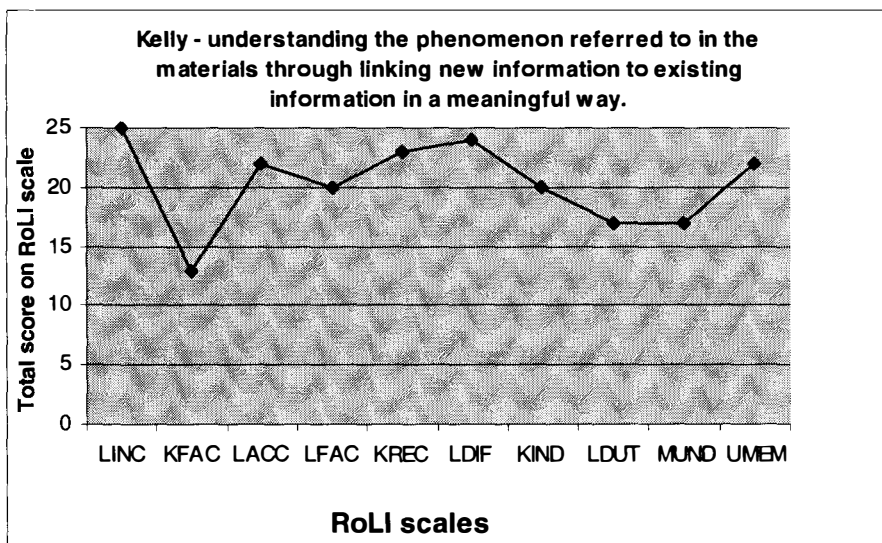


Figure 11. Kelly's RoLI profile

Kelly's profile (Figure 11) was not predictable from the interview data. She has endorsed most strongly *learning is an increase in knowledge* and *learning is seeing things differently*. But she has also endorsed *learning is accumulating factual*

knowledge, learning is collecting facts and knowing is recalling information which was not predicted for a meaning-oriented conception. As predicted, she has not endorsed *knowledge is discrete and factual* and has endorsed *understanding occurs before memorising* much more strongly than *memorising occurs before understanding*.

Summary

There was a tendency for respondents to endorse most scales. Notable exceptions were *knowledge is discrete and factual, learning is a duty, and memorising occurs before understanding*. The agreement with most scales means it is not possible to identify from the RoLI profiles whether the participants had indicated accumulative or meaning-oriented conceptions in their interviews.

The results of the comparisons between the expected RoLI profile and actual RoLI profile are recorded in Table 12. Only three of the nine RoLI profiles matched with the expectations from the interview data: Vivian, Stephanie, and Carmen. Vivian and Carmen had flat profiles that indicated endorsement of most scales and reflected the meaning-oriented ‘what’ and accumulative ‘how’ conceptions identified by them in the interviews. The third match was for Stephanie, one of the two participants identifying the conception *learning is understanding the meaning of what is being taught through thinking about the material and trying to understand it*.

The five non-matches, irrespective of whether participants identified accumulative or meaning-oriented conceptions in the interviews, endorsed RoLI scales associated with both accumulative and meaning-oriented conceptions. The three participants who identified the accumulative conception *Learning is increasing one's knowledge by doing study activities* unexpectedly endorsed *knowing is thinking independently* (Josey, John and Mary). Of these, Mary and John rejected *knowledge is discrete and factual* which also was not expected. Two of the participants, George and Kelly, who

identified meaning-oriented ‘what’ and ‘how’ conceptions in the interviews endorsed the accumulative conceptions *knowing is recalling information, learning is accumulating factual knowledge* and *learning is collecting facts* in the RoLI. Again this was different from the predictions. The conception of learning identified by Rhonda, *learning is increasing one’s knowledge automatically by physically doing a set task*, was not reflected in the RoLI scales.

Table 12. Results Of The Match Between An Expected RoLI Profile Based On Interview Data And The Actual RoLI Profile.

Participant	Type of conception	Expected profile matched RoLI profile
Rhonda	Unelaborated	A profile could not be predicted
Josey	Accumulative	No
John	Accumulative	No
Mary	Accumulative	No
Vivian	Meaning-oriented /accumulative	Yes
Stephanie	Meaning-oriented	Yes
George	Meaning-oriented	No
Carmen	Meaning-oriented	Yes
Kelly	Meaning-oriented	No

The lack of any strong correspondence between the interview analyses and the RoLI profiles needs consideration. There are a number of possible explanations. One possibility is that different phenomena were investigated by the two methods. Alternatively, there may be methodological issues, for example:

- a) the questionnaires may not have been filled in truthfully.
- b) the statements in the questionnaire were not understood in a meaningful way.
- c) the analysis of the interview transcript was faulty.
- d) the interview process was faulty.
- e) the RoLI is faulty.

Further research is required to follow this up if the short RoLI is to be used confidently as a diagnostic tool for individuals.

Whole Sample Responses To The Reflections On Learning Inventory

The nine participants interviewed were selected from a larger group of Indigenous students who gained entry to the preparation programme. Of the larger group, 36 returned a completed RoLI. The RoLI data from this larger group is similar to the data for the participants interviewed. The box and whisker plot in Figure 12 indicates the median, the 25th and 75th percentiles, and the range for each scale. The plot shows clearly that there was fairly strong agreement with all scales except two: *knowledge is discrete and factual* and *learning is a duty*. It also shows that all subjects combined endorsed most strongly the scale for *learning is an increase in knowledge* followed by *knowing is recalling information*. Also endorsed were *learning is accumulating factual knowledge*, *learning is collecting facts*, *learning is seeing things differently*, *knowing is thinking independently* and *understanding occurs before memorising*.

Although not strongly endorsed by the sample, there was a range of responses to *memorising occurs before understanding* suggesting more variation in the sample on this scale than on other scales. The epistemology scale *knowledge is discrete and factual* and the scale *learning is a duty* attracted a range of responses and were neither endorsed nor rejected collectively by the sample. The relationship between understanding and memorising is interesting. The participants strongly endorsed *understanding occurs before memorising* with no one responding negatively.

However, there was a range of responses from strongly disagree to strongly agree to *memorising occurs before understanding*, with the most frequent responses being not sure, or the statement does not apply to them.

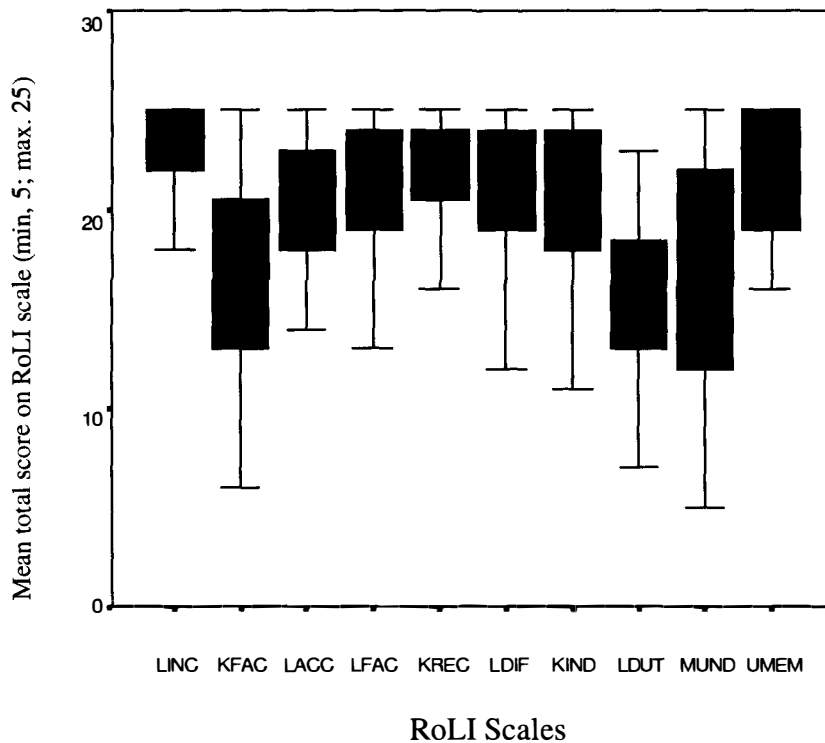


Figure 12. Whole sample response to the RoLI scales.

As already noted, the sample responded positively to most items in the inventory, resulting in a marked skew. The most frequent response was ‘strongly agree’. 72% of responses were either ‘agree’ or ‘strongly agree’ whereas only 15% were either ‘disagree’ or ‘strongly disagree’. Meyer and Boulton-Lewis (1997b) also noted a skew in the distribution of responses using the longer RoLI.

Discussion Of Whole Sample Results

Overall, there was endorsement of most of the RoLI scales resulting in a fairly flat profile. The sample endorsed most strongly the conception *learning is an increase in knowledge*. In the work by Marton et al. (1993), this conception appears in two

forms: as a prior and overarching conception, and, when associated with a quantitative increase in discrete and factual knowledge, as a specific conception. The sample did not collectively endorse *knowledge is discrete and factual* suggesting that the conception *learning as an increase in knowledge* may exist in both forms in the sample.

As well as endorsing scales which reflected accumulative conceptions of learning: *learning is accumulating factual knowledge, learning is collecting facts, knowing is recalling information*, the sample strongly endorsed scales which suggest meaning-oriented conceptions of learning: *learning is seeing things differently, knowing is thinking independently* and *understanding occurs before memorising*. These tendencies towards meaning-oriented conceptions of learning are similar to findings reported by Wilss et al. (1999) in their study of Indigenous university students.

There was greater agreement with *understanding occurs before memorising* than *memorising occurs before understanding*. The greater variation and lower median value for *memorising occurs before understanding* would appear to suggest this is not necessarily a part of learning for all participants. The agreement by some participants with both these scales would suggest they are not mutually exclusive. In particular, the relationship between understanding and memorising warrants further study.

Interestingly, *learning is a duty*, which was predicted from the theory as possibly being highly endorsed by Indigenous learners, was neither endorsed nor rejected by the participants. This suggests that respondents were not sure about it or felt it did not apply. This finding does not reflect the perceptions of staff working with Indigenous students. They claim that students feel a strong duty to use the learning they have acquired for the benefit of their community. Perhaps there is a distinction between learning as a duty and using knowledge as a duty. That is, learning is an individual responsibility, but, having acquired the knowledge, there is a

responsibility to use it to the benefit of the Indigenous community. This would fit with Indigenous values of autonomy and collectivism, and the RoLI would not identify such a distinction.

Seemingly conflicting statements emerge as compatible for this sample. Both accumulative and meaning-oriented scales were endorsed, for example, participants responded positively to scales linking learning to *collecting facts*, *accumulating factual knowledge* and *seeing things differently*, and to scales linking knowing to *recalling information* and *thinking independently*. Perhaps participants were considering a range of learning contexts rather than a single context when responding to the inventory.

Another possibility is that these factors are not contradictory. Instead, they may challenge existing theory on accumulative and meaning-oriented conceptions. There is some evidence for this. In 1995, Meyer concluded that results from the RoLI did not support a separation into accumulative and meaning-oriented conceptions (Meyer, 1995). In a recent study by Meyer and Boulton-Lewis (1999) *knowing is thinking independently* was linked to *knowing is recalling information*. Meyer and Boulton-Lewis (1999) concluded their results did “not support a single clearly defined empirical model of conceptions of learning and associated constructs” (p.289).

Alternatively, it is possible that cultural issues are confounding the responses to the inventory. This has been found to be the case in American studies with other inventories (e.g., Smith, 1990, in Padilla & Lindholm, 1995). With Australian Indigenous participants, the results could be confounded by the primacy of relationships in Indigenous culture, the Indigenous construct ‘shame’ and the perception of a White teacher as an ‘authority’. These cultural values could have resulted in a reluctance to disagree with the items in the questionnaire.

Chapter Conclusion

There was a tendency for participants to endorse most scales. Irrespective of whether they identified accumulative or meaning-oriented conceptions in the interviews, in the RoLI they endorsed scales associated with both accumulative and meaning-oriented conceptions. Only three of the nine predictions from the interview data matched with the RoLI data.

The RoLI data for the whole sample is similar to the RoLI data for the participants who were interviewed. Most scales were endorsed suggesting a recognition of multiple conceptions. The non-endorsement of *knowledge is discrete and factual*, and *memorising occurs before understanding* suggests there may be a greater emphasis on understanding than is usually found in accumulative conceptions. The non-endorsement of *learning is a duty* does not support the suggestion made by Boulton-Lewis et al. (1997) that this may be a conception specific to Indigenous students.

On the basis of the findings of this exploratory study it seems unlikely that it is possible to predict a RoLI profile from interview data or vice versa.

CHAPTER EIGHT

DISCUSSION

Introduction

The purpose of this study was to investigate the conceptions of learning identified by Indigenous students commencing a university preparation course. Subsidiary questions arising from this were: What do they think learning is? What do they anticipate that they will do in order to learn? Do all the participants see learning in a similar way? A second question related to the validity of the methods used to collect such data and investigated whether analysis of the RoLI data produces similar conceptions of learning as those elicited from analysis of semi-structured interviews. This chapter considers the findings in relation to the research questions.

Conceptions Of Learning Identified In Interviews By Indigenous Students

Entering A University Bridging Course

In the interviews, participants were asked what they meant by learning and what they would do to learn something really well. The results from the interview analysis indicated that there was not always a match between what participants thought learning was and how they would go about it. It is as though the question "What do you think learning is?" elicited a definition of something which, in many cases, they had not really thought about. However, participants were much more able to talk about how they would go about learning, albeit without any elaboration (i.e., they simply named the activities they would do, such as study, read, do research, memorise, think, and understand.)

Conceptions Of What Learning Is

Three of the conceptions identified focused on what learning is.

W1 *Learning is increasing one's knowledge.*

W2 *Learning is understanding the meaning of what is being taught.*

W3 *Learning is understanding the phenomenon that is being referred to in the learning material.*

Learning is increasing one's knowledge referred to a straightforward increase in factual and discrete knowledge. It was an accumulative conception of learning where memorisation was emphasised more than understanding. Four interview participants identified this conception.

The other two conceptions, *learning is understanding the meaning of what is being taught* and *learning is understanding the phenomenon that is being referred to in the learning material* focused on meaning-making, and can be regarded as meaning-oriented conceptions. In these conceptions, knowledge was regarded as meaningful and participants spoke of the need to discern through a process of understanding and the senselessness of simply memorising. Three participants identified learning as *understanding the meaning of what is being taught* and two identified the deeper conception, *learning as understanding the phenomenon that is being referred to in the learning material*.

To summarise, the Indigenous people in this study identified learning as an increase in knowledge, understanding the material being taught and, in two cases, understanding the phenomenon referred to in the material. In this respect they identified similar conceptions to those identified in the study by Marton et al. (1993), but with a stronger focus on learning as gaining understanding. In their study, Wilss et al. (1999) also found that Indigenous students identified similar conceptions to other students, and also found a stronger focus on learning as gaining understanding.

Conceptions Of The Results Of Learning

The interview participants in this study identified four conceptions that referred to the outcome of learning.

R1 Learning is to be able to do new things.

R2 Learning is becoming empowered.

R3 Learning is seeing things differently.

R4 Learning is to know the meanings of things and why it is so.

Learning is to be able to do new things was identified by five participants. This conception has been described by Marton et al. (1993). It was associated with the accumulative conception: *learning is an increase in knowledge*. The second outcome conception, *learning is becoming empowered*, was associated with a dualistic view of knowledge. In this conception, empowerment came from knowing the 'right' way of doing things. Such a conception is easily understood given the disenfranchisement of Indigenous people in contemporary Australian society.

Three participants mentioned the outcome *learning is seeing things differently*. Marton et al. (1993) described this meaning-oriented conception as referring to the learner "changing his or her way of thinking about something" (p. 290). They described two forms of this conception: an internal process where one's view of something is adapted to a different perception; and learning the skill to see things from a range of perspectives. These two forms were both found in this study, but an additional third form was also identified and it was associated with an accumulative conception. Mary referred to being taught to see a specific thing differently and this was associated with learning to see it the 'right' way. In one sense, then, there is no learning without 'seeing things differently'. The distinction is whether the different view is absorbed or constructed.

The fourth outcome of learning: *Learning is to know the meanings of things and why it is so* was identified by one participant. This conception implies going beyond the meaning in the material and was associated with the most sophisticated conception of “what learning is” identified in this study.

Conceptions Of How Learning Happens

Generally the conceptions of how learning happens seem limited and underdeveloped. Although participants could talk about what they did in general terms, few described or explained what they did when note-taking, reading, etc. Five of the nine participants did not seem to have any awareness of choice in how to do the tasks set by the teacher. However, five different conceptions of how learning happens were identified in the interviews.

- H1 *Learning happens automatically by physically doing a set task.*
- H2 *Learning happens by doing study activities such as studying, reading, note taking, doing research, memorising.*
- H3 *Learning happens through maturation and experience.*
- H4 *Learning happens through thinking about the material and trying to understand it.*
- H5 *Learning happens through linking new information to existing knowledge in a meaningful way.*

The first conception, *learning happens automatically by physically doing a set task*, was distinguished from the others through its undifferentiated view of learning and doing: they are one and the same thing. The second conception *learning happens by doing study activities such as studying, reading, note taking, doing research, memorising* was the most common conception of how learning occurred. This is similar to a conception identified by Purdie (1994): *learning is memorising, reproducing, and studying*, and was associated with each conception of what learning is including, (through Carmen), *learning is understanding the phenomenon*.

One participant, Carmen, suggested that *learning happens through maturation and experience*, and this was associated with a holistic view of knowledge. In this conception learning was described as happening as a result of experience, but how experience and maturation resulted in learning was not explained. This conception was associated with the conceptions *learning happens by thinking about the material and trying to understand it* and *by doing study activities, etc.*

Three participants identified the conception, *learning happens by thinking about the material and trying to understand it*. There was no reference to linking the new information to other information. It was as though what was presented was self-contained. There was no elaboration in the interviews of how participants would 'think' and 'try and understand'. It is possible that these participants were simply quoting a more extensive list of generic study skills than participants who identified learning as happening through doing study activities such as studying, reading, note-taking, doing research, memorising.

The fifth conception of how learning happens, *by linking new information to existing knowledge in a meaningful way*, was identified by one participant. This was the deepest conception identified in that it went beyond the meaning of the text to the significance of the meaning. It was associated with understanding phenomena.

With one exception, each participant identified only one way learning happens. The exception, Carmen, who had a sophisticated meaning-oriented conception, identified learning as happening through doing study activities, through maturation and experience and through understanding.

The participants who identified learning as understanding identified the results of learning as becoming empowered and/or seeing things differently.

In general, explanations of how learning happens appear naïve and lacking in reflection. Participants would do the activities set by the teacher and do various study

activities without elaborating further about how they would study. Similarly, they would think and try and understand without indicating what they would think about or how they would try and understand. Those participants who saw learning as trying to understand talked about going over the material until it made sense, and about going over it again step by step. They usually described a process of repeating for themselves the way the teacher or the textbook introduced the material. They did not describe creative, original or independent manipulation of the ideas.

Discontinuities In The Conceptions Identified In The Interview

The participants identified conceptions of what learning is that have been previously described in the literature, but did not associate them with convincing descriptions of how learning happens. Participants who saw learning as an increase in knowledge named various activities associated with study, but did not indicate an awareness of effective ways of doing the activity. Participants who indicated that learning was about understanding spoke of thinking and trying to understand. It is possible that they were also naming activities without an awareness of effective ways of trying to find meaning.

Two participants (Vivian and Carmen) had more obvious discontinuities between what they thought learning was and how it happened. Vivian expressed a meaning-focused conception of what learning is but did not describe the process of learning as one of making meaning. Instead, she named typical study activities without elaborating on any associated mental activity. Carmen described learning as understanding phenomena, but the way she described learning was more likely to result in understanding the meaning of the text than the phenomenon. In Carmen's case, this may have been due to English not being her first language.

This discontinuity probably reflects the inexperience of the participants as learners. With one exception, they showed little awareness of choice in how to approach a

learning task and those with meaning-oriented conceptions showed little understanding of how to find meaning.

Conceptions Endorsed In The Reflections On Learning Inventory

The RoLI results for the participants who were interviewed were plotted as profiles. Except for Rhonda's profile, which will be discussed later, the other eight profiles were most striking for the endorsement of all scales except three: *knowledge is discrete and factual*, *memorising occurring before understanding*, and *learning is a duty*. Only four participants endorsed *knowledge is discrete and factual*, two endorsed *memorising occurring before understanding*, and one participant endorsed *learning is a duty*. *Learning is an increase in knowledge* was strongly endorsed by most participants and since this was not always associated with *learning is collecting facts*, it may be that the generic conception *learning is an increase in knowledge* is being recognised here. These results are very similar to those found by Fuller (1999) with education and training students.

One might expect the following pairs of scales to be contradictory: *knowing conceived as recalling information* and *knowing is thinking independently*, and *learning is accumulating factual knowledge* and *learning is seeing things differently*. The first in each pair refers to an accumulative conception of learning and the second refers to a meaning-oriented conception of learning. However, *knowing conceived as recalling information* and *knowing is thinking independently* were both endorsed, as were *learning is accumulating factual knowledge* and *learning is seeing things differently*. This suggests that they were not regarded as contradictory by the participants. These findings lend support to Meyer's (1995) conclusion that there is not a clear separation of conceptions into accumulative and meaning-oriented.

It was assumed in this study that meaning-oriented conceptions were represented by the endorsement of the RoLI scales *learning is seeing things differently* and *knowing*

is thinking independently, and associated with the non-endorsement of *knowledge is discrete and factual*, *learning is accumulating factual knowledge*, *learning is collecting facts* and *knowing is recalling information*. If so, then from the RoLI data there was only one respondent, Stephanie, with a meaning-oriented conception.

Rhonda's profile is notable for its non-endorsement of any scales and may represent a lack of any reflection about learning. Alternatively, it may indicate that she did not understand the questionnaire or chose not to fill it in truthfully.

The RoLI profile for the whole sample (the 36 students who returned the questionnaire) showed an endorsement by respondents of *learning conceived as an increase in knowledge*, *knowing conceived as recalling information*, *understanding occurring before memorising*, and *learning conceived as seeing things differently* (see Figure 12). Fuller (1999) found a similar pattern of responses with first and fourth year education students and with training students. Seemingly conflicting statements, for example, understanding and memorising, emerge as compatible for this sample. This might be because the respondents had in mind a range of learning contexts when filling in the inventory or it might indicate a cultural reluctance to disagree with the 'authority' of the questionnaire.

A Comparison Of Conceptions Of Learning Endorsed In The RoLI Data With Those Elicited From The Semi-Structured Interviews

This study assumed that if the conceptions identified in the interviews matched the findings from the RoLI then the validity of the findings would be increased. This study found that it was not possible to predict a RoLI profile from the interview data, or vice versa. There was no clear separation into those profiles representing accumulative conceptions and those profiles representing meaning-oriented conceptions. Meyer (1995) and Meyer and Boulton-Lewis (1999) also found that the RoLI did not reflect a clear separation of conceptions of learning. Clearly, the

analysis of the RoLI data did not produce similar conceptions of learning to those elicited from analysis of semi-structured interviews with Indigenous people entering university. In some cases, however, the RoLI could be better interpreted in the light of extra information from the interview data.

The difference between the RoLI results and the interview analysis may be an artefact of the two different procedures. In the interviews, the participants were talking about what learning is and recalling experiences. The interviews were like a window onto the participant's experience of learning, where the whole experience is bigger than the view from the one window. Other interviews may offer different windows onto the experience as different things are recalled and talked about. The RoLI, on the other hand, allows respondents to recognise a range of conceptions and therefore they might identify more conceptions than are recalled in the interview.

There is evidence from other studies that different ways of trying to get at conceptions result in different findings. For example, Watkins and Regmi (1992; 1995) found different conceptions identified by Nepalese students in interviews than in their written responses. Taylor (1994b) found inconsistencies between data collected from questionnaires, data from structured and unstructured written responses, and data from structured interviews.

However, there may be a more fundamental problem with the RoLI items, which were developed from statements made in qualitative interviews. By taking the utterances out of the context of the phenomenographic interviews in which they were made, the nuance of their meaning may have been lost and the statements may have become difficult for respondents to interpret. The internal reliability and validity checks in the instrument development phase are aimed at correcting for this. Nonetheless, some respondents did comment on having difficulty understanding the statements, and that they were confused by the repetitive nature of some of the items in the RoLI.

A problem with both the interview and the RoLI data is that neither referred to a recent learning experience, but to learning in a general sense. It is possible that respondents had a range of learning situations in mind when responding, and hence the apparently contradictory statements. In addition, the participants were being asked to anticipate what learning at university would be like. Both the interview and the RoLI may be more valid if used with reference to a recent, specific learning experience.

Moreover, the two questions 'what is learning?' and 'what do you do to learn?' provided an invitation to give two answers. Participants may not have considered the nexus between what they do and what they hope to achieve through learning. Further, as Säljö (1997) has noted, the relationship between what students say they do and what they actually do in specific learning situations is not known.

Taking Säljö 's (1997) argument a stage further, if people adopt and use certain accounting practices when they talk about phenomena, it would not be surprising if their interview replies sounded more like unreflected definitions of learning rather than a description of the experience of learning. Also, given their relative inexperience as learners, it is not surprising that this description was sometimes tautological and contradictory. They were simply using the language (accounting practices) that was available to them and considered by them to be appropriate to the context. Hence, they used institutionalised accounting practices such as 'read', 'study' 'understand it' 'think', 'do research' for describing how to learn without being able to explain what is involved. Further the participants could talk about learning as understanding without being aware of how to make understanding happen.

However, all students are not the same. Two participants (Carmen and Kelly) were able to describe a learning experience that involved the transformation of information and construction of knowledge. This suggests that where participants could describe an experience, they did so. But whether some participants were not able to describe

an experience because they have not had the experience, or whether they simply do not know how to talk about it remains unknown.

The Variation In How Participants Saw Learning

Although there were inconsistencies between the RoLI data and interview analyses, it is clear from both the interview and the RoLI data that there were variations in how the participants viewed learning. Some saw it simply as an increase in knowledge, while others saw it as something more complex involving understanding, drawing on experience and making meaning. These findings reflect similar variations in the mainstream student population.

The general endorsement of all the RoLI scales relating to learning and knowing lends weight to Meyer's (1995) argument that instead of there being clear distinctions between the conceptions, there may be a gradual transition from accumulative to meaning-oriented conceptions.

Some General Observations

Learning As Empowering

The scale *learning is a duty* was not endorsed by the respondents in the RoLI. The items in this RoLI scale refer to duty as an external control. This conception might conflict with Indigenous values of autonomy. On the other hand, the interview data emphasised learning as empowering where 'White's man's ways and knowledge' are considered to have more currency than Indigenous ways and knowledge.

Discussions with Indigenous colleagues indicate that whilst learning is not a duty, there is a collective duty to use the results of learning, that is knowledge of White man's ways, for the collective good of the (Indigenous) community. It may be this

conception of duty which is detected in the work by Boulton-Lewis et al. (1997), and not the *learning is a duty* conception operationalised in the RoLI.

Learning As Understanding

The participants in this study have emphasised understanding and meaning-oriented conceptions of the ‘what’ aspect of learning. This unexpected emphasis on learning as understanding by Indigenous students was also noted by Wilss et al. (1999). A number of factors may contribute to this including Indigenous epistemology, the age of the participants, and the gender of the participants.

Traditional Indigenous epistemology is holistic and relational. A relational epistemology is usually associated with meaning-oriented conceptions.

Accumulative conceptions are usually associated with a discrete and factual conception of knowledge. An underlying Indigenous epistemology may be reflected in the non-endorsement of the RoLI scale *knowledge is discrete and factual*. It may also be reflected in the tendency for participants in the interviews to identify meaning-orientated conceptions of what learning is. If epistemological beliefs have a stronger effect on conceptions of what learning is than experience does, this may explain the discontinuity between what learning is and how it happens noted in this study.

In the literature review, it was noted that mature students were more likely to have a meaning-orientation than younger students. It is argued that life experiences promote approaches that assess and relate ideas (Biggs, 1995, and Harper & Kember, 1986, in Richardson, 1994b). In this study, the participants in the interviews were all mature with adult experiences of the world, the youngest participant being 20, and had been out of school for 3 years. Over half of the participants identified the ‘what’ aspect of learning as understanding meaning but this was associated with naïve descriptions of how learning happens. It appears those approaches that are considered to be

promoted by life experiences are not being transferred to the anticipated study situation.

The emphasis on meaning-making noted in this study may also be reflecting women's ways of learning. Hazel et al. (1997) have suggested that connectedness is crucial to women's ways of knowing. In this current study, two thirds of the RoLI respondents were women and seven out of the nine participants in the interviews were women.

Finding Meaning

The literature on conceptions of learning suggests a dichotomy in the conceptions based on the significance of meaning into accumulative and meaning-oriented conceptions. Marton et al. (1993) suggested that meaning was absent in the first three conceptions. But clearly this is not so, and later Marton et al. (1997) described an accumulative conception where meaning is committed to memory.

The participants in this study identified both memorising meaning and understanding meaning. They also identified different depths of understanding. Some spoke of understanding the words, others the meaning of the text, and one participant spoke of the need to understand how things fit together with her prior knowledge. Clearly different conceptions of learning are associated with different conceptions of understanding.

Participants with an accumulative conception of what learning is expected to learn through carrying out various study activities, and referred to understanding as “grasping the meaning” of new information. They indicated that understanding was an aid to memorising. This is consistent with the RoLI data, where most of the respondents endorsed *understanding occurring before memorising*.

Participants with a more meaning-focused conception identified two depths of understanding meaning. Participants who focused on trying to understand the material in order to learn emphasised a personal involvement in re-constructing the material. However, their view of 'understanding' was limited to understanding the material being taught and was achieved by repeating and understanding the stepwise explanation used by the teacher or book. In contrast, two participants described trying to understand the phenomenon referred to in the text. Here the participants seem to have realised text refers to something to be understood and that the text is only one way of getting to the phenomenon. Thus learning appears to involve being aware of what they already know, and linking that to information from other sources in order to construct some meaning. The result of this would be the construction of an unique meaning.

Methodology Issues

The Interview

During the analysis of the interview transcripts it became apparent that most participants had little experience of reflecting on what learning meant. The data reflected naïve and undifferentiated notions of learning and little metacognitive awareness. This raises the question of how close what they say they will do is to what they actually do. It is not known whether they would approach a specific learning situation with strategies other than those described in the interviews. Nor is it known whether they would be able to describe more articulately what they are doing. Taylor (1994b), referring to the gap between students' ideas about learning and what happens *in situ*, cautions against making judgements based on data from interviews about learning generally. It seems likely that students anticipating study, as in this research, may be limited in what they can say about their learning by the language they have access to, and by their previous experiences.

A number of the participants in this study identified inconsistent ideas about learning. This fits well with discourse theory which stresses the functional relationship between language and context. From a cognitive perspective, these discrepancies fit with Schon's theory of 'reflective practice' (cited in Wilss et al., 1999) where what a person believes and what they do are not necessarily linked unless there is some 'reflection in action'.

The RoLI Questionnaire

The findings from the RoLI data are also problematic. Whilst there is no doubt about its reliability as a statistical instrument, the findings do not fit well with the findings from phenomenographic data. Meyer (1995) himself has indicated that although the items themselves have come from phenomenographic interviews, when operationalised, the same dichotomy into accumulative and meaning-oriented conceptions is not found.

In addition, the scales seem biased towards accumulative conceptions of learning. Other common conceptions such as *learning is understanding* and *learning is being able to do more things/better* are not available through the RoLI. Furthermore, there are concerns that the vocabulary and the repetitiveness of language used in the RoLI items may make it difficult for some participants to respond to.

Cultural Issues

In addition to possible difficulties with the formal language used in the questionnaire and interview, there are a number of other cultural factors that could result in the data being confounded. As indicated in Chapters Four and Seven, these include Indigenous Australian values concerning the primacy of relationships, and perceptions of race, class and 'authority'. Although the study was designed to minimise these risks, further research by Indigenous researchers would be useful.

Conclusions

The analyses of the data from the interviews indicates that the participants described more sophisticated ideas about what learning is than about how learning happens. Five of the nine participants clearly expressed conceptions of learning that involved understanding and talked about becoming empowered and seeing things differently through learning.

However, the way the participants described learning happening is not likely to lead to these results. For example, 'becoming empowered' and 'seeing things differently' involved being taught the 'correct' way of doing things or the 'correct' knowledge. This is different from being able to see things from a range of perspectives and becoming powerful through the development of, for example, critical thinking skills.

So while the participants could define learning as understanding, often this was accompanied by an accumulative description of how learning happened. This discontinuity suggests that participants had not thought deeply about learning, and may also reflect their inexperience as learners.

It must be remembered that these participants were asked to talk about learning in a general sense and outside of any specific learning context. Had they been asked to talk about learning whilst engaged in a learning activity as in the original experiment by Säljö (1979, in van Rossum & Schenk, 1984), different findings may have resulted.

Participants were also asked to anticipate what learning at university would be like, a context about which they knew nothing. In many cases they had not studied successfully beyond Year 10 level. Their descriptions of how to learn, with the exception of one participant, could be regarded as repeating what they had been told by a teacher. Thus expressions like "read this chapter", "go to the library and do some research", "make sure you understand it" in the absence of anything more

structured and directed, become instructions for 'how to study'. This may be a reflection of school experiences that have emphasised an accumulative conception of knowledge and provided the students with little opportunity to transform knowledge and experience deeper ways of learning. There seems to be no transfer of any deeper understanding from the life world to the learning context. It appears that these participants have little experience of how to study in a way conducive to success at university, when success requires the use of critical thinking skills.

Implications For Teachers

A picture has emerged from this study of a group of students who are motivated to study at university and who exhibit a range of conceptions of what learning is. For five of the nine participants, to learn is to become empowered and/or to understand things. These goals fit with the goals of higher education. It is also possible they view knowledge as holistic and relational. This is an epistemology that is compatible with university learning.

However, participants in this study have indicated that they are very naïve about how learning happens. Without explicit instruction in how to learn, they may make limited progress, or may even fail to learn.

Five participants indicated a reliance on the teacher with an emphasis on learning the 'correct' knowledge. They believed they were learning when they could recreate the meanings explained by the teacher. If this is the case, a shift in agency from the teacher and learning materials to the student is desirable. The teacher should provide learning experiences to encourage students to become personally responsible for creating their own meanings. Work by van Rossum et al. (1985) suggests that the acquisition of a conception of learning is developmental and influenced by the academic context. The job of the teacher becomes one of challenging accumulative conceptions of how learning happens. Learning experiences need to be structured

to encourage students to seek meaning and relationships. Group work can facilitate the development and sharing of meanings. Students also need opportunities to reflect on developing knowledge and to critically consider different perspectives. In short, a pedagogy that models a relational epistemology and multiple perspectives is required since this epistemology underlies the critical perspective embedded in a university education.

Implications For Future Research

This exploratory study suggests a number of areas for further research. Of particular interest to teachers working with Indigenous students in university preparation courses are whether similar conceptions are identified in specific learning situations rather than anticipated learning situations, and the nature of the change both in individual participants' conceptions of learning and in the RoLI profile for the group at the end of the year.

Of more general interest is whether the conceptions *learning is an increase in knowledge through doing the tasks set by the teacher* and *learning happens through maturing and seeing things differently* are identified by other university students, in particular other students commencing preparation courses for university. Finally, it would be useful to investigate whether the discontinuity between what learning is and how it happens found in this study is found in other students from similar educational backgrounds.

The lack of any strong correspondence between the interview analyses and the respective RoLI profiles suggests further research is required to follow this up if the short RoLI is to be used confidently as a diagnostic tool for individuals.

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Appendix A: Reflections On Learning Inventory (RoLI) - Scales And Items

Scale	Items
Learning conceived as an increase in knowledge	<p>Learning is a process of increasing one's knowledge.</p> <p>Learning is adding new facts to those already known.</p> <p>Learning is gaining more knowledge about something.</p> <p>Learning is adding more pieces of knowledge to what you already know.</p> <p>Learning is taking in new information.</p>
Knowledge conceived as discrete and factual	<p>Knowledge really just consists of pieces of information.</p> <p>Knowledge has a discrete and factual nature.</p> <p>All knowledge is factual.</p> <p>Knowledge means knowing the right facts.</p> <p>Everything that needs to be learned is known.</p>
Learning conceived as accumulating factual knowledge	<p>I believe that learning is getting all the facts into your head.</p> <p>I believe that learning is being able to recall knowledge when required.</p> <p>I believe that learning is about collecting all the facts that might be important.</p> <p>I believe that learning is knowledge built up by accumulating quantities of information.</p> <p>I believe that learning is acquiring knowledge that has a discrete and factual nature.</p>
Learning conceived as collecting facts	<p>Learning is collecting all the facts that need to be remembered.</p> <p>Learning is filling your memory with facts.</p> <p>Learning is absorbing facts.</p> <p>Learning is acquiring new facts for immediate or future use.</p> <p>Learning is being able to reproduce facts when they are required.</p>
Knowing conceived as recalling information	<p>I know I have learned something when I can recall the relevant facts about it.</p> <p>I know I have learned something when I can recall necessary information.</p> <p>I know I have learned something when I can recall the basic concepts.</p> <p>I know I have learned something when I can recall procedural detail.</p> <p>I know I have learned something when I can recall what I have learned after I have been tested on it.</p>

<p>Learning conceived as seeing things differently</p>	<p>I believe that learning involves seeing things from a new perspective.</p> <p>I believe that learning can enable you to see the world in a different way to others.</p> <p>I believe that learning helps you see things differently compared to how they looked before.</p> <p>I believe that learning is discovering new ways of thinking about things.</p> <p>I believe that learning is when one develops new ways of interpreting reality.</p>
<p>Knowing conceived as thinking independently</p>	<p>I know I have learned something when I can fill the gaps in someone else's argument.</p> <p>I know I have learned something when I can do something without thinking.</p> <p>I know I have learned something when I can fill the gaps in someone else's logic.</p> <p>I know I have learned something when I can carry out a task without guidance.</p> <p>I know I have learned something when I can form counter arguments of my own.</p>
<p>Learning conceived as duty</p>	<p>When I am learning, I feel as if I am being conditioned.</p> <p>When I am learning, I feel as if I am being made to conform.</p> <p>When I am learning, I feel I am discharging a moral duty.</p> <p>When I am learning, I feel as if I am fulfilling an obligation.</p> <p>When I am learning, I feel as if I am carrying out a duty.</p>
<p>Memorising occurring before understanding</p>	<p>In order to make sense of something, you first have to commit it to memory.</p> <p>You need to commit something to memory before you can make meaning out of it.</p> <p>You have to commit something to memory in order to make sense of it.</p> <p>Before you can explain something to yourself, you first need to commit it to memory.</p> <p>Something that has been committed to memory can only be explained afterwards.</p>
<p>Understanding occurring before memorising</p>	<p>In order to commit something to memory, you first have to make sense of it.</p> <p>You need to know the meaning of something before you can commit it to memory.</p> <p>You have to make sense of something in order to commit it to memory.</p> <p>Before you can commit something to memory, you need to be able to explain it to yourself.</p> <p>I can explain to myself something that has been committed to memory.</p>

Appendix B: The Questionnaire

Reflections on Learning Inventory for ASIT participants

Introduction to the questionnaire

- I am looking at what people think learning is and how they go about it.
- The questions are about what you think learning is and what it involves. When I have looked at the data, I will give you feedback about your beliefs if you would like.
- There are no 'right' or 'wrong' answers. A response is 'right' if it is really how you feel.
- **Your answers to the questions have nothing to do with the ASIT test result.** That process is finished with and a decision has been made. The information you give me is for this study only. No-one else will know that these answers are your answers.
- If you have not signed a form consent form agreeing to take part in this research, would you please read and sign the consent form now. It is policy that you sign a form saying you are aware of what the purpose of the study is and that you agree to participate.
- Some examples of the questions:
 1. My learning has developed as a result of the influence of a particular person. 5 4 3 2 1
 2. When I am learning, I feel I am in control of what I am doing. 5 4 3 2 1
 3. My learning has developed as a result of observing the way my friends learn. 5 4 3 2 1

Instructions for filling in the questionnaire

- The responses are to be about learning in a formal education institution like school, TAFE or university.
- Please read through the statements and decide whether you agree or disagree. Often you may disagree, that is OK.
- Some of the statements seem very similar to each other. This is not to trick you, but to help as find the best way of wording the questions.

How to fill in the questionnaire

For each item, you must circle a number.

5 means you definitely agree

4 means that you agree, but have some reservations,

3 means you are not sure, or the statement does not apply
to you

2 means that you disagree, but with some reservations

1 means that you definitely disagree

{RoLI inserted here }

(End of Questionnaire)

I need to collect certain personal data to help me find any patterns in the information I collect. Please provide the following information.

Name Gender M / F (please circle)

Suburb, State and postcode of where you live

Age last birthday years.

Year in which you last attended school or college 19

Level of schooling you reached

Is there any one else in your family who has studied or is studying at University?..... Y / N

Would you like to receive feedback about your answers? Yes please /No
thank you

Thank you very much for you time and co-operation. If you have any queries, please contact me,
Alison Bunker, {contact details}.

Appendix C: The Interview Schedule

Introduction to the interview

- Introduce myself ...my name is Alison Bunker and I have taught on the bridging course for six years.
- Explain the project ...In this study I am looking at what people applying for entry through the ASIT actually think learning is and how they go about it. I am asking students a series of questions about what they think learning is and what it involves.
- **Your answers to the questions have nothing to do with the ASIT test.** That is finished with and being marked now!
- Explain confidentiality ... The information you give me is for this study only. No-one else will know that these answers are your answers. You can stop the interview at any stage and choose not to answer any questions if you wish.
- Hand student the consent form and explain ...It is the policy that you sign a form saying you are aware of the purpose of this study and that you agree to participate. Would you please read and sign the consent form now.
- Explain the tape recorder ...I would like to tape this interview as a way for me to check on what I have written. It provides a back up for my notes. Is that all right by you?
- Explain that the responses are to be about learning in a formal educational institution
- Switch on the tape recorder and commence the interview.

Key Questions

1. When did you last study? Where?
2. What were you studying?
3. Why have you decided to apply for entry to university?
4. Is there anyone else in your family who has studied or is studying at university?
5. What do you think learning at university will be like?
6. When you say you are learning something, what do you mean by 'learning'?
7. How do you know when you have learned something?
8. When you have set out to learn something really well, what sorts of things did you do?

(What sorts of things do you do to prepare for exams/assignments/general study?)

Clarify any uncertain questions and answers. Thank the participant for their time and turn off the tape recorder.

Would participant like to receive feedback of study?

Yes / No

		Rhonda	Josey	John
		Learning is increasing one's knowledge automatically by physically doing a set task.	Learning is increasing one's knowledge by doing study activities.	Learning is increasing one's knowledge by doing study activities, specifically repetition and practice.
What	Referential meaning	Learning is to learn. Learning is about doing new and different things, knowing more.	Learning is to learn. Being able to do a task set out before you.	Absorbing information
	External horizon	Life world	Study situation	Study situation
	Internal horizon	The teacher, the learner, an activity designed by the teacher, action.	The teacher, material to be learnt organised by teacher for learning, learner.	The material to be learnt, repetition until it 'sinks in'.
How	Referential meaning	By doing the task	By doing: do research, find out information, study, memorise. Need a teacher.	By practice and rote learning,
	External horizon	Study situation	Study situation	Study situation
	Internal horizon	Do things that have been set. Increased understanding over time and by repeating similar activities.	The material to be learnt, studying including memorising, repeated acts of learning: study, ie read and write, do things that have been set.	The material to be learnt, 'studying' including memorisation and practice.
Outcome of learning		Apply it with increasing competence	Being able to do a task set out before you	Being able/more able to do something
Specific info.		Teacher essential	Teacher essential	Strong focus on memorising and reproducing
Knowledge		Factual, procedural	Discrete and quantitative	Factual and discrete

		Mary: Learning is increasing one's knowledge by doing study activities.	Vivian: i) Learning is becoming empowered by learning the 'proper' way to do things. ii) Learning is understanding the meaning of what is being taught by doing study activities.	George: Learning is understanding the meaning of what is being taught through thinking about the material and trying to understand it. Learning results in empowerment.
What	Referential meaning	Absorbing information, including different ways of seeing things.	i) Learning the proper way to do things ii) Understanding how to do things	Understand things
	External horizon	Study situation	Study situation	Study situation
	Internal horizon	The learner, the material to be learnt, 'grasping' of the material by reading, discussing, reviewing, answering practice questions. Understanding over time involved in the 'grasping'.	The learner, the material to be understood application of the material to be understood. Understanding of how to do it.	The learner, the material to be understood, thinking about the material, understanding
How	Referential meaning	By doing: do 'everything', 'study', 'review'	Repeated acts of learning: study, ie read and write, apply.	By repeating the steps/logic presented by the teacher until the sense becomes apparent.
	External horizon	Study situation	Study situation and real world	Study situation
	Internal horizon	Learner, the material to be learnt/absorbed, acts of reviewing and studying.	Repeated acts of doing and applying until it sinks in.	Repeated explanation until the meaning until it clicks.
Outcome of learning		Can do something automatically	i) Being empowered by knowing the 'right way' to do things ii) Being able to do things	Understanding results in empowerment.
Specific info.		Getting organised	Understand how to do something	
Knowledge		'Out there', factual but linked	Applied, there is a right and wrong knowledge	Knowledge is empowering

		Stephanie: Learning understanding the meaning of what is being taught through thinking about the material and trying to understand it	Carmen: Learning is understanding the phenomenon that is being referred to in the learning materials (i) by doing study activities. (ii) through thinking about the material and trying to understand it. (iii) through maturation and experience.	Kelly: Learning is understanding the phenomenon that is being referred to in the learning materials through linking new information to existing information in a meaningful way.
What	Referential meaning	Gaining more knowledge; either new things or extending your understanding of what you already know.	Gaining more knowledge; having a different view of things.	Gaining more knowledge; and understanding the meanings of things.
	External horizon	Life world	Life world	Life world
	Internal horizon	Learner has new knowledge about something so it appears different.	Learner, phenomenon, maturation and experience, alternate ways of seeing phenomenon	Learner developing some meaning that had not been developed before.
How	Referential meaning	By understanding: by listening and explaining it to self.	(i) By studying, taking notes and memorising. (ii) Looking into the material, relating to prior knowledge, forming an opinion. (ii) Through maturation and experience.	Absorb it: compare to what you already know and assimilate it. Does not force a re-evaluation of what is known, rather it is an extension of what is known ie not about changing as a person.
	External horizon	Study situation	Life world and study world	Life world
	Internal horizon	Acquiring by thinking about it and trying to understand it. Involves learner, learning material, and 'thinking'.	You experience life and learn automatically. At school, you listen, read, and 'do research'.	Learner is introduced to new information, recalls relevant known information in brain already, interprets and synthesises the two through questioning of self and others; involves absorbing, storing and memorising.
Outcome of learning		Seeing things in a new light	(i) Seeing things differently (ii) Empowerment	Increased understanding; being able to "interpret it and have facts and proof of it".
Specific info.		Learning also includes seeing things differently	Limited knowledge of strategies.	Acquisition
Knowledge		Knowledge constructed	Holistic, related	Knowledge constructed

What learning is	W1 Learning is an increase in knowledge (Rhonda, Josey, John, Mary)	W2 Learning is understanding the meaning of what is being taught. (Vivian, George, Stephanie)	W3 Learning is understanding the phenomenon referred to in the learning material. (Carmen, Kelly)
Referential meaning	Gaining more knowledge	Understanding or gaining meaning of the sign	Understanding or gaining meaning of the signified
External horizon	Life world	Study situation	Study situation
Internal horizon	Learner having some knowledge, learner has more at a later point in time.	Learner developing some meaning that had not been developed before	Learner developing some deeper meaning that had not been developed before

How learning happens	H1 Automatically by physically doing a set task. (Rhonda)	H2 By doing study activities. (Josey, John, Mary, Vivian, Carmen)	H3 Through thinking about the material and trying to understand it. (George, Stephanie, Carmen)	H4 Through maturation and experience. (Carmen)	H5 Through linking new information to existing knowledge in a meaningful way. (Kelly)
Referential meaning	Physically doing the task set by the teacher	i) take in and store facts by repetition ii) retrieving what has been learned and stored	Looking at the material, and repeating the steps/logic presented by the teacher until relationships of the steps (the sense) becomes apparent.	As you mature you have more experiences and therefore are wiser	If you have more knowledge it will appear different
External horizon	Study situation	Study situation	Study situation	Life world	
Internal horizon	Do things that have been set. Learning happens automatically.	i) learner, filling the head, pieces of knowledge ii) repeated acts of learning 'until it sinks in'	i) Learner, logical presentation of learning material starting from the known, the logical steps, discerning acts ii) Repeated explanation until the meaning until it clicks.	Automatically wiser because you are older and have had a range of experiences.	Learner, material, acts of discerning links with existing knowledge, apply changed knowledge.