Computer-mediated learning in a social constructivist environment

Tony Stojkovski
University of Wollongong


This paper is posted at Research Online.
NOTE

This online version of the thesis may have different page formatting and pagination from the paper copy held in the University of Wollongong Library.

UNIVERSITY OF WOLLONGONG

COPYRIGHT WARNING

You may print or download ONE copy of this document for the purpose of your own research or study. The University does not authorise you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site. You are reminded of the following:

Copyright owners are entitled to take legal action against persons who infringe their copyright. A reproduction of material that is protected by copyright may be a copyright infringement. A court may impose penalties and award damages in relation to offences and infringements relating to copyright material. Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
Computer-mediated Learning in a Social Constructivist Environment

A thesis in (partial) fulfilment of the requirements for the award of the degree

Doctor of Education

from

UNIVERSITY OF WOLLONGONG

by

Tony Stojkovski (BPE, BEd, MEd)

Faculty of Education

2010
ABSTRACT

For many years, information and communication technology has been introduced into the classroom with a focus on providing better instruction for the learner and assisting teachers in delivering the educational content. Some have argued, however, that pedagogical strategies based on the principles of social constructivism are likely to be more effective than those concerned with information transmission (Salomon, 1993; Palincsar, 2005). Such strategies emphasise the construction of knowledge through social interaction supported by computer technology, termed ‘computer mediated communication’. Many studies have examined learning outcomes that result of computer-mediated communication (Du Plessis, et al., 1995; Veerman, et al., 2000; Pear & Crone-Todd, 2001; Scardamalia, et al., 1994; Bronack, et al., 2006), but few have examined environments that involve both on-line and face-to-face oral communication. This study addresses that gap by investigating learning outcomes achieved through the use of a software program that aims to support social construction of knowledge. The program is called the computer-mediated social constructivist environment (CMSCE).

In order to examine the effectiveness of the use of CMSCE, a qualitative research method was used to answer three sub-questions:

(a) What are the characteristics and the balance of the mixed mode (oral and written) communication that is stimulated by this environment?
(b) How does the active engagement in the computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content?
(c) What are the students’ perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and the learner in the project?

The study collected student work submitted through the CMSCE, recordings of in-class discussions, student feedback about the learning process and the researcher’s field notes to provide complementary and confirmatory information. The analysis examined characteristics of the communication stimulated by the environment and the ways in which the CMSCE program supported interactions within the class in order to enhance
learning and enable an enriched understanding of the content. The study also examined students’ perceptions of the learning environment.

The study found that the CMSCE program provided an opportunity for each individual to learn at different learning rates. It also allowed the teacher to cater the learning tasks to an individual’s learning ability and interest.

It was evident that students developed an in-depth knowledge of their content in a way that may have been difficult in a traditional classroom. A key advantage was the flexibility of the learning environment. Using the CMSCE program to submit a series of drafts of their work, enabled students and the teacher to engage in numerous discussions they perhaps would otherwise not be able to do. These discussions helped students collaborate during the lessons and outside of the classroom.

Even though generalisations from this study are limited, they might allow practitioners to utilise similar teaching methods in other teaching environments. The study had a strong external validity because it was conducted in its natural setting (Mertens, 1998). However, applying the CMSCE program in a different school with different teachers and students may have not produce the same results as this research. The students, the school and classroom environment and the teacher’s epistemological perspective are likely to influence the outcomes. Of particular importance is a teacher’s pedagogical approach to teaching and the willingness to create and support social constructivist environment in the classroom.
ACKNOWLEDGEMENTS

I would like to thank my supervisors; Irina Verenikina and Sue Bennett, for their assisting in helping me manage my research and document my thoughts and ideas. They have been amazing in their knowledge and availability throughout my time at Wollongong University and I can’t thank them enough for their unwavering support.

Also, I would like to thank Lisa Brown for reading and editing my thesis.

Finally, this study would not have been possible without the assistance of my wife, Jessica, who has been my motivation since the beginning. She has managed my stress, read my work and given me great advice throughout the writing of this thesis.
TABLE OF CONTENTS

ABSTRACT ..................................................................................................................... ii
ACKNOWLEDGEMENTS ............................................................................................. iv
TABLE OF CONTENTS ............................................................................................... v
LIST OF FIGURES ........................................................................................................ x
LIST OF TABLES ............................................................................................................ xi

1. Chapter 1 Introduction ......................................................................................... 1
   1.1 Introduction ....................................................................................................... 1
   1.2 Background to the study .................................................................................. 3
   1.3 Research questions .......................................................................................... 4
   1.4 Significance and limitations of the study ......................................................... 4
   1.5 Research strategy and context ......................................................................... 5
   1.6 Structure of the thesis ...................................................................................... 6

2. Chapter 2 Literature Review .............................................................................. 8
   2.1 Introduction ....................................................................................................... 8
   2.2 Theoretical background ................................................................................... 9
      2.2.1 Social constructivist approach to learning ............................................. 10
      2.2.2 The role of language in learning ............................................................ 16
      2.2.2.1 Speech and learning .......................................................................... 17
      2.2.2.2 Written language and learning ......................................................... 18
      2.2.2.3 Oral and written language in on-line communication ....................... 20
   2.3 Social constructivist learning environments and technology ......................... 23
   2.4 Technology in the classroom .......................................................................... 24
      2.4.1 Applications of technology to collaborative learning ............................. 30
      2.4.2 Computer supported collaborative writing .............................................. 36
   2.5 Summary .......................................................................................................... 45

3. Chapter 3 Methodology ...................................................................................... 48
   3.1 Introduction ...................................................................................................... 48
   3.2 Research design ............................................................................................... 48
3.2.1 Case study approach .......................................................... 49
3.3 The participants ........................................................................ 50
3.4 The philosophy of social constructivism ..................................... 50
3.5 Computer-mediated Social Constructivist Environment (CMSCE) ... 51
3.6 The classroom arrangement ....................................................... 53
3.7 Lesson design ........................................................................... 53
3.8 Data gathering methods ............................................................ 54
3.9 Data analysis ............................................................................ 58
  3.9.1 Analysis of social constructivist learning ................................. 59
  3.9.2 The students perception of learning ....................................... 63
3.10 Limitations of study ................................................................. 64
3.11 Ethical considerations ............................................................. 65
3.12 Summary .................................................................................. 66

4 Chapter 4 Case Study Analysis .................................................... 67
4.1 Introduction ................................................................................ 67
4.2 Sara .......................................................................................... 68
  4.2.1 Student's sequence of learning ............................................. 68
  4.2.2 Sara's task related communication ...................................... 72
  4.2.3 Evidence of socially constructed episodes and development of in-depth knowledge ......................................................... 73
  4.2.4 Student's reflection on the learning process ......................... 77
4.3 Jenny ....................................................................................... 78
  4.3.1 Student's sequence of learning ............................................. 78
  4.3.2 Jenny's task related communication .................................... 80
  4.3.3 Evidence of socially constructed episodes and development of in-depth knowledge ......................................................... 81
  4.3.4 Student's reflection on the learning process ......................... 83
4.4 Diane ....................................................................................... 85
  4.4.1 Student's sequence of learning ............................................. 85
  4.4.2 Diane's task related communication .................................... 88
  4.4.3 Evidence of socially constructed episodes and development of in-depth knowledge ......................................................... 89
4.4.4 Student's reflection on the learning process ................................................. 91

4.5 Amy ..................................................................................................................... 92
  4.5.1 Student's sequence of learning ................................................................. 92
  4.5.2 Amy's task related communication .......................................................... 95
  4.5.3 Evidence of socially constructed episodes and development of in-depth knowledge ................................................................................. 96
  4.5.4 Student's reflection on the learning process .......................................... 99

4.6 Lisa ..................................................................................................................... 99
  4.6.1 Student's sequence of learning ................................................................. 99
  4.6.2 Lisa's task related communication ......................................................... 101
  4.6.3 Evidence of socially constructed episodes and development of in-depth knowledge ................................................................................. 102
  4.6.4 Student's reflection on the learning process .......................................... 104

4.7 Mandy ............................................................................................................. 106
  4.7.1 Student's sequence of learning ................................................................. 106
  4.7.2 Mandy's task related communication ..................................................... 109
  4.7.3 Evidence of socially constructed episodes and development of in-depth knowledge ................................................................................. 110
  4.7.4 Student's reflection on the learning process .......................................... 112

4.8 Ann .................................................................................................................. 113
  4.8.1 Student's sequence of learning ................................................................. 113
  4.8.2 Ann's task related communication .......................................................... 114
  4.8.3 Evidence of socially constructed episodes and development of in-depth knowledge ................................................................................. 116
  4.8.4 Student's reflection on the learning process .......................................... 118

4.9 Hillary ............................................................................................................. 119
  4.9.1 Student's sequence of learning ................................................................. 119
  4.9.2 Hillary's task related communication ..................................................... 122
  4.9.3 Evidence of socially constructed episodes and development of in-depth knowledge ................................................................................. 123
  4.9.4 Student's reflection on the learning process .......................................... 124

4.10 Mary ............................................................................................................. 125
  4.10.1 Student's sequence of learning ............................................................... 125
4.10.2 Mary's task related communication ............................................................. 128
4.10.3 Evidence of socially constructed episodes and development of in-depth knowledge ............................................................... 129
4.10.4 Student's reflection on the learning process ............................................... 130
4.11 General social construction patterns ............................................................. 131

5 Chapter 5 Conclusion, Discussion and Recommendations .................................. 135
5.1 Introduction ......................................................................................................... 135
5.2 Summary of findings ........................................................................................... 137
  5.2.1 Question 1: What are the characteristics of the mixed mode (oral and written) communication stimulated by the CMSCE environment? ............ 138
      5.2.1.1 The characteristics of written communication ..................................... 140
      5.2.1.2 The characteristics of oral communication .......................................... 142
      5.2.1.3 The characteristics of the mixed mode of oral and written communication .......................................................... 146
  5.2.2 Question 2: How does the active engagement in the computer-mediated interaction with the teacher and peers affect student's learning (both the process and the outcomes)? Does it lead to an enriched and deeper understanding of the content? ........................................................................................................... 148
      5.2.2.1 Evidence of the influence of social construction of knowledge and deep understanding of the content .............................................................. 152
  5.2.3 Question 3: What are the student's perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and learner in the project? ...................................................... 159
      5.2.3.1 Student's perception of the learning environment ............................... 159
  5.3 Discussion ............................................................................................................ 163
  5.4 Conclusion ......................................................................................................... 167

REFERENCES ............................................................................................................. 169

APPENDIX A UNIT OUTLINE .............................................................. 179
APPENDIX B ASSIGNMENT TASK ............................................................. 190
APPENDIX C ORAL COMMUNICATION TRANSCRIPT ......................... 192
APPENDIX D OBSERVATION OF LEARNING JOURNAL
APPENDIX E SEQUENCE OF LEARNING
APPENDIX F FOCUS GROUP QUESTIONS
APPENDIX G TRANSCRIPT OF FOCUS GROUP INTERVIEW
APPENDIX H ANALYSIS OF EPISODES OF LEARNING
APPENDIX I PARENT INFORMATION SHEET
APPENDIX J STUDENT INFORMATION SHEET
APPENDIX K PRINCIPAL CONSENT FORM
APPENDIX L PARENT CONSENT FORM
APPENDIX M STUDENT CONSENT FORM

ix
LIST OF FIGURES

Figure 3.1 EXAMPLE OF STUDENT'S NOTE PAGE ........................................... 52
LIST OF TABLES

Table 3.1 DATA COLLECTION METHODS USED FOR EACH RESEARCH QUESTION

Table 3.2 ANALYTICAL FRAMEWORK USED TO IDENTIFY LEVEL OF SOCIAL CONSTRUCTIVISM

Table 3.3 CRITERIA USED TO IDENTIFY TYPES OF SOCIAL CONSTRUCTIVISM EPISODES

Table 4.2 SARA’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.3 JENNY’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.4 DIANE’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.5 AMY’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.6 LISA’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.7 MANDY’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.8 ANN’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.9 HILLARY’S COMMUNICATION TO THE TEACHER AND PEERS

Table 4.10 MARY’S COMMUNICATION TO THE TEACHER AND PEERS

Table 5.1 SUMMARY OF STUDENT’S LEVELS OF SOCIAL CONSTRUCTIVISM
1. INTRODUCTION

1.1 Introduction

Over the past three decades, advanced information and communication technology have been introduced into the classroom with a focus on providing better instruction for the learner and assisting teachers in delivering the educational content. Despite significant effort, many technologies have had limited impact; it has been argued, that the use of new technologies needs to be supported by sound pedagogical approaches (Salomon, 1993; Palincsar, 2005).

One pedagogical strategy which has been used in conjunction with technology is social constructivism. According to social constructivist approach, students learn best in collaboration with others when they socially construct their understanding rather than accepting it at a face value (Vygotsky, 1978; Smagorinsky, 2007). The essence of collaboration is the construction of shared meanings and understanding, with all members of the group sharing cognitive responsibility for a task. As a result, the knowledge developed in collaboration with more knowledgeable members of society is more comprehensive and deeper (Palincsar, 2002).

The social constructivist approach to teaching has been applied in the classroom in numerous ways, from situated learning (e.g., Lave, 1988) and collaborative learning (e.g., Johnson, Johnson & Smith, 1991), to social construction of knowledge using computer-mediated (on-line) communication, such as the Computer Supported Intentional Learning Environment (CSILE) (Scardamalia, Berieter & Lamon, 1994). With the popular use of technology, in particular the Internet, many more people can share their knowledge and understanding. As a result, social constructivist learning environments using on-line communication have been developed and researched extensively over the past two decades. The opportunity to provide formal learning outside of the classroom has been utilised by tertiary institutions and distance learning schools, but has also been integrated into other face-to-face settings to enhance links with the world outside the classroom. On-line learning has not only created a change in
the learning environment, but also affected the way members of the class communicate with each other.

There has been a significant focus on research into social constructivist approaches supported by technology that give students the opportunity to develop a deeper understanding of content and foster higher order cognitive skills (Jonassen, 2000). Scardamalia, Bereiter and Lamon (1994) explored on-line learning in a social constructivist environment. They demonstrated that carefully designed learning environments which utilise on-line communication can enhance both understanding of content and develop higher order thinking through computer-mediated communication. Many studies have examined learning outcomes that result from computer-mediated social interaction (Du Plessis, et al., 1995; Veerman, et al., 2000; Pear & Crone-Todd, 2001; Scardamalia, et al., 1994; Bronack, et al., 2006), but few have examined authentic environments that involve both on-line and face-to-face oral communication. This study addresses that gap by investigating the ways that a computer-supported collaborative learning environment could utilise both oral and written communication to support the social construction of ideas and the development of a deeper understanding of the content.

The theoretical basis for social constructivist approach to learning through social interaction has its basis in Vygotsky’s sociocultural approach to learning, which has been advanced through a significant body of research and theoretical work (Wells, 1999). According to this approach, language is a vital tool for communication and sharing ideas and thoughts with others. It is used to determine problems and create solutions. A learning environment which encourages students to share their thoughts with others enables them to explore evidence through discussion and argue their perspective based on the evidence (Johnston, Woodside-Jiron & Day, 2001).

This study aims to investigate learning and communication in a computer-mediated social constructivist environment in an authentic classroom setting. The computer-mediated environment supports both oral and written communication. The research examined the development of learning over the course of the study, together with the students’ perceptions of their learning. The types of communication used by the teacher
and the students were analysed to help determine the effectiveness of communication in enabling the social construction of knowledge.

1.2 Background to the study

In this study, software was purposefully designed and implemented by the researcher, who was also the teacher, in order to support a social constructivist environment in his classroom. This learning environment aimed to provide opportunities for the students to socially construct knowledge in two inter-related ways based on ideas from Vygotsky’s (1978, 1986) work. Firstly, it aimed to extend the teacher-student collaboration beyond the classroom by enabling a discussion, which starts as an oral discussion in the classroom, to continue in a written mode during the student's self study time. Secondly, the program design endeavoured to give the students an opportunity to assist each other in the building of knowledge, which increased the opportunity for social interaction and students to engage in discussion with their peers.

The system designed for this study, was named CMSCE, Computer Mediated Social Constructivist Environment. Its interface page was linked to a database which stored retrievable information. Each student had their own page. The interface page allowed each student to submit written entries, written questions and written comments. Members of the class, including the teacher could view a student’s work and post a comment on their page, but they could not alter their work.

The students were asked to use the system while working on their assignment through the term. Each student could submit an entry at anytime and as often as they liked, but they were supposed to submit at least one. By submitting drafts of their assignment using an on-line system, students were provided with an opportunity to receive and utilise consistent written feedback from the teacher. Additionally, a possibility of written feedback from peers was inbuilt in the system. The written exchange of ideas assumed to be complemented by oral communication in the classroom during which students would be encouraged to discuss their topic with their peers and the teacher.
A significant part of the learning environment was the teacher-researcher’s social constructivist approach which included encouraging the students to engage in oral and written communication to discuss their ideas with the teacher and their peers when working on their assignment. This was of particular importance in the computer-mediated environment where communication might not happen spontaneously. In his communication with the students, the teacher utilised a number of teaching techniques consistent with socio-constructivist approach such as questioning and prompting to nurture the developing knowledge of the student.

1.3 Research questions

This study aimed to examine the way that a social constructivist learning environment supported the CMSCE program, and how this program contributed to students’ learning, by addressing the following sub-questions:

(a) What are the characteristics and the balance of the mixed mode (oral and written) communication that is stimulated by this environment?

(b) How does the active engagement in the computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content?

(c) What are the students’ perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and the learner in the project?

1.4 Significance and limitations of the study

Socio-constructivist approach to learning has become increasingly popular in educational research and practice. The significance of this study is in that it explores the ways that computer-mediated communication can support socio-constructivist learning environment in a natural setting of a secondary school. This study examined the ways that written computer-mediated communication can support and complement spontaneous oral communication in the classroom to assist the social construction of knowledge.
The limitations of this research include the potential difficulty in transferring the results into another setting if the teacher does not have the same social construct teaching philosophy and is unable to facilitate effective interaction and therefore effective construction of knowledge. It may also be difficult to transfer the results into a school with a different demographic; that is, a class with a mixed gender group, or a class of a larger size may yield different results because the dynamics between the students and the teacher and students may be different.

1.5 Research strategy and context

The nature of the research questions was considered in determining the method of research. The research questions focus on the process, development and implementation and of a program and its participants. Therefore, a qualitative approach was the most appropriate because the study was conducted in a natural setting and exhibited a stronger external validity (Mertens, 1998). Qualitative research of this kind is used to examine a naturalistic approach to its subject matter; that is, the researcher views phenomena in a natural setting and attempts to interpret the meanings of the situation without imposing pre-existing expectations on the study (Mertens, 1998).

The study used a case study approach. In education, a case study approach is the favoured method because it identifies the limitations and practicalities of the study and the results allow the reader of the research to generalise subjectively from the case in question and examine it against their own experiences (Creswell, 2007; Stake 1994).

This study took place in an all-girl private school. There were nine participants in this study. They were Year 11 students aged between 15 and 16 years of age.

The qualitative data collection techniques used in this study were open-ended and flexible to facilitate the emergence of new categories of meaning and experience. Data was collected via observations, recorded dialogues, focus group interviews and the analysis of students’ written work over the course of a term. Students submitted their work on the CMSCE program and their oral and written communication during the task was recorded and analysed. The process of social construction of the students’
responses and the consequent written submission was examined (Salomon, 1993). The students’ learning development was analysed as a group and as individuals to examine the effectiveness of the CMSCE in the classroom.

Data was analysed through a variety of methods. Written and oral recordings of each student’s communication was recorded and examined. The information was imported into NVivo and coded as written or oral communication. The characteristics of the communication was determined and examined as a group and as individuals. The communication was further examined to determine social construction between students and teacher and student. Two analytical frameworks developed from the literature (Chan, Scardamalia & Bereiter, 1992; Cobb, 1994; King, 1990, 1991, 1992; Salomon, Globerson, & Guterman, 1989; Slavin, 1996) were used to characterise the level of social constructivism and the type of social construction which occurred between students and identified whether it assisted them in constructing their responses. An evaluation of the learning environment (including the CMSCE program) was conducted in a group interview after the task was completed to ascertain the students’ view of their own learning during the study. The interview was conducted by an independent interviewer in order to minimise bias and to obtain a more accurate response from the students.

1.6 Structure of the thesis
This opening chapter outlines the origin and rationale for the study and provides an overview of the investigation. The remaining chapters expand on the issues raised in more detail.

Chapter Two provides a review of the relevant literature focusing on current thinking and empirical findings concerning social constructivist learning and the use of technology as a medium for this type of learning. Chapter Three describes the research design and details the qualitative case study approach that was taken. It also describes the design and development of the learning environment, including the cases, resources and activities. The results and details of the data analysis processes used are presented in Chapter Four. Chapter Four also includes the various forms of analysis which corresponds to each question, i.e. examination of oral and written data, examination of
the sequence of learning and examination of the student’s perception of their learning. Chapter Five presents the findings in response to the research questions, discusses the implications for practice and suggests possibilities for further research work. Supporting documents to which readers may wish to refer are included in the appendices at the end of the thesis.
2 LITERATURE REVIEW

2.1 Introduction

Over the past three decades, technology has been developed and introduced into the classroom to provide better instruction for the learner and to assist teachers in delivering educational content. Numerous programs, such as word processing, database and spreadsheet software, have changed the way of delivering educational content (Hedberg & McNamara, 2002). In the 1990s, the use of computer technology in education increased due to the emergence of low cost high-powered portable computers (Newhouse, 1999), and since then researchers have argued that computers could stimulate a change in the approach to teaching and learning (Palincsar & Herrenkohl, 2002). During this period, educational institutions have developed practices which have a greater focus on student-centred learning. With the advent of technology and, in particular computers, these institutions became able to provide a more flexible learning system (Pea, 1985).

It has been argued that to make the best use of technology in the classroom, advanced approaches to pedagogy need to be implemented (Salomon, 1993; Palincsar, 2005). This chapter examines a social constructivist approach to teaching and learning and its potential for implementation of technologies in the classroom. Vygotsky’s socio-cultural theories as theoretical underpinnings of social constructivism, including the zone of proximal development, are examined. The concept of distributed cognition (Salomon, 1993), which demonstrates the advantages of teaching and learning using social interaction, is reviewed to emphasise the educational benefits of sharing thoughts and ideas in the development of understanding. Research into the use of technology within the social constructivist paradigm in the classroom is evaluated, including the findings and limitations of each study.

The social construction of knowledge is generally defined as the learning of new ideas and the development of understanding through the anchoring, articulation and elaboration of concepts in collaboration and social interaction with other people (Bansford, Brown & Cocking, 2000). Even though social constructivism has increased in popularity with schools and teachers, it can still be difficult to implement because
people in Western societies have individualistic tendencies when studying and a commitment to a common understanding might be difficult to achieve (Palincsar, 2005).

Within the socio-cultural approach, communication with more knowledgeable members of society is the underlying premise of learning and development (Vygotsky, 1978). Learning is seeing as a process of social negotiation or collaboratively making sense of theories, mentoring, and joint knowledge construction. Through the process of collaboration, negotiation of meaning helps to shape and define new knowledge, which is constantly reconstructed as new experiences arise (von Glasersfeld, 1989; Davydov, 1995; Cobb and Yackel, 1996). Technology can be used to enhance the communication process between teacher and student as well as between peers when learning environments are designed according to social constructivist principles.

The use of technology as a means of communication has given rise to a variety of social constructivist computer-based programs such as The Computer Aided Education (CAE) system model used by Du Plessis, Van Biljon, Tolmie and Wollinger (1995); Computer-mediated Communication (CMC) used by Veerman, Andriessen and Kansclarr (2000); Computer-Aided Personalised System of Instruction (CAPSI) used by Pear and Crone-Todd (2001); Computer Supported Intentional Learning Environment (CSILE) used by Scardamalia, Berieter and Lamon (1994); and AET Zone used by Bronack, Riedl and Tashner (2006). These will be discussed below.

2.2 Theoretical background

While the research in social constructivism is evolving in its influence on teaching, in the reality of school education, traditional methods based in behaviourist and cognitive approaches are still the more familiar teaching styles used in the classroom. The hallmark of direct instructional teaching (traditional teaching methods) is that the teacher maintains control of the pace, sequence, and content of the lesson (Bauman, 1988; Shy-Jong, 2007). A traditional approach to teaching is described as focussed “on the direct transmission of knowledge of facts from teachers to students” where the “students are just passive receivers, just listening, taking notes and memorizing the knowledge or facts” (Shy-Jong, 2007,
Such an approach may limit students’ potential because they would not be able to explore the content at their own pace, or they may struggle if the teacher’s guidance and the instructions are not clear or too abstract.

In contrast, social constructivist researchers contend that new knowledge is actively created by learners through interaction with others, on the social, interpsychological level (Dahms et. al, 2007). The literature that follows discusses the characteristics of learning in a social constructivist environment and the suitability of technology in supporting and managing this approach to teaching and learning.

2.2.1 Social constructivist approach to learning

The need to use a different approach to teaching as opposed to the traditional classroom approach has been now widely recognised (Dahms et. al, 2007). The realisation that learning is not a process by which knowledge is written or transplanted to a person’s mind, and that the mind is not a blank slate waiting to be written on, led to the popularity of the constructivist and the social constructivist approaches (Novak, 1977; Driver & Easley, 1978; John-Steiner & Mahn, 1996; Palincsar, 1998).

The development of social constructivism can be traced back to the time when behaviourist approach was challenged by the constructivist view of learning (Piaget, 1963). Within behaviourist approach, learning is defined as a change in behaviour as a result of an experience, where conditioning a certain behaviour involves reinforcement either negative or positive, to induce a particular response (Skinner, 1953). While behaviourist principles can be effective in teaching and refining new skills, this paradigm does not promote self-motivation and learning is driven and controlled by the teacher’s delivery of the content (Ryan & Deci, 1996).

Constructivist approaches to teaching stemmed from Piaget’s theories (1963) which emphasised the view of learning as a learner-centred process driven by self-discovery. Constructivist theory posits that individuals build their own views of reality from the knowledge they construct as a result of the signals that are actively received by their own senses (Cobb & Yackel, 1996). Piaget viewed children as active learners. He
believed that children are motivated to understand their environment and that their development is strongly located in their pursuit of answers and that the prior conceptions of the learner would affect the outcome of those answers (Vialle et al., 2005). Learners construct increasingly sophisticated ways of knowing solely on the basis of their personal experiences as they attempt to achieve their goals by resolving situations that they find problematic (von Glasersfeld, 1989; Cobb, 1994; Cobb & Yackel, 1996). Due to its emphasis on individual discovery this approach sometimes is called cognitive, or individual, constructivism (Vialle et al., 2005).

The notion that the learner constructs knowledge through social interaction and collaboration with other people has been developed since Vygotsky introduced a socio-cultural approach to learning (Wells, 1999). According to Vygotsky, learning is culturally, socially and historically mediated (Vygotsky, 1978). Socio-cultural approaches to learning and development reject the notion that knowledge is located in the individual in favour of the concept of knowledge as a social construct (Minick, 1989). Three major themes permeate Vygotsky’s writings about socio-cultural theory. Firstly, the suggestion that individual development, including higher mental functioning, has its origins in social sources. Secondly, tools and signs mediate human action, on both social and individual planes, and thirdly, the first two themes are best examined through genetic or developmental analysis (Palincsar, 1998; John-Steiner & Mahn, 1996; Wertsch, 1991). From this perspective, it can be concluded that learning and understanding is derived from social interaction. As a result, considerable effort has been devoted to finding ways in which learning and development can be enhanced from a social constructivist perspective.

There is a diversity of definitions of, and perspectives on, social constructivism, but most agree that an individual’s development occurs when he or she interacts with other individuals. A variety of collaborative approaches have been developed through empirical research and reviews of literature with many researchers drawing their viewpoints from Vygotsky (Cobb, 1994). Palincsar and Brown (1984) designed an intervention, called reciprocal teaching, in which students were taught to socially construct meanings from text. The intervention proved successful as a means of enhancing reading comprehension skills. Von Glaserfield (1989) acknowledged that
learning occurs as a person interacts with members of the community. Bausersfeld’s (1980) version of constructivist learning complements this view, but Bausersfeld goes further suggesting that communication and social interaction assist in modifying and adapting current knowledge. Mutual adaptation is enabled through communication and subtle shifts in knowledge are constructed through social interaction (Bausersfeld, 1980; Voight, 1985).

A close relationship between social interaction and the development of understanding is evident in this paradigm, particularly the inference to dialogue and argumentation as a form developing subtle shifts in one’s thought process. According to Adams (2008), “social constructivist learning… requires an understanding of the process and argumentation to develop a view of reality” (p. 386). This enables a person to gather multiple perspectives of a situation and develop a greater understanding of educational content. There is no one particular way to view the world and therefore social constructivist learning environments should “draw attention to multiple perspectives and diverse ways of viewing and solving problems” (Kim & Reeves, 2007, p. 214). Obtaining information from a variety of sources allows a person to develop a broader understanding of a topic and consequently derive a deeper meaning. Interaction with several people allows a person to view the world through multiple perspectives which can enhance meaning and understanding by utilising the experiences and previous research of other individuals.

Learning through social interaction is an ongoing process. Continual discussions with another individual and presentation of ideas to an audience enables the person presenting to revisit information from a variety of view-points, giving him or her broader understanding of the content and a deeper knowledge of a topic. This is described more succinctly from an educational perspective as follows:

Social constructivists view learning as neither solely intrinsic nor purely extrinsic, but, rather as a contiguous process that exists each time people wilfully interact with each other in the world around them. Learning is manifest in the intellectual aptitude, cognitive strategies, motor skills, and dispositions people develop while working toward a common goal within a
community of others. Effective learning environments of all kinds must support participants as each becomes part of a community of practice through communication and co-construction (Bronack, Riedl, & Tashner, 2006, p. 221).

What the students display in their intellectual aptitude, cognitive strategies, motor skills, and dispositions gives an indication of what the students learn and their understanding of the content being taught. The students display their intrinsic knowledge outwardly in their interaction with the world around them.

Learning requires constructing and re-con 构建 understanding through interaction with a variety of sources, encouraging individuals to continuously review their existing interpretation of the world. Salomon (1993) suggests that knowledge is constructed through collaborative efforts and that cognition is distributed among individuals who enable the individual to continually conquer tasks that seem beyond his or her capabilities. Salomon (1993) further explains that distributed cognition is a view that thinking does not reside in one’s mind, but is distributed amongst people as well as artefacts and symbols during thinking, reflection, and learning. Cognitive tools, such as computers and the Internet, can be viewed as artefacts that can distribute cognition.

Despite the diversity in emphasis and definition, researchers who adopt socio-cultural approaches to learning and development invariably highlight the centrality of collaboration in the process. Collaborating with a more competent person is the way a greater understanding is reached (Vygotsky, 1978). Vygotsky introduced the notion of the zone of proximal development, which he defined as “the distance between the actual development level as determined by independent problem-solving and the level of potential development as determined by problem-solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p.85).

The teacher or more competent person can be seen as a relative expert on a topic. Their experience and/or knowledge of the topic enable the learner to develop a greater understanding of an idea. However, the social interaction with a novice will often benefit both the novice and the expert. This concept is explored by Rogoff (1998) who
proposes that collaboration between experts and novices will enhance understanding especially if the expert is marginally more advanced than the novice’s current level of performance. However, in a study examining a socio-cultural approach to observing and planning for the learning and development of children, Rogoff (1998) suggests that even far removed experts and novices benefit from collaboration and that there is a mutual benefit in the collaborative interaction. Rogoff (1998) conducted a study in which 5 and 9 year olds collaborated with each other in planning efficient routes through a model grocery store. The results showed that cognitive gains were evident when the participants shared task responsibility and that the 9 year olds produced better planning skills when working with their younger partners. The suggestion from the studies is that shared responsibility is more important than having someone explain the solution. The collaboration of ideas led to a better understanding of the problem and the development of better solutions.

Social interactions lead to a negotiated understanding. This form of collaboration can provide benefits for the expert and novice on a particular topic. Understandings and outcomes can be negotiated by experts and novices and, rather than imposing a prescribed outcome on learners, teachers should accept that each individual will interpret information differently and their understanding of content will be unique (Smagorinsky, 2007; Rogoff 1998). This implies that in collaborative learning the learner is exposed to alternative viewpoints that challenge initial understanding. This sort of social engagement leads to the development of new and original knowledge that is developed and constructed from several sources (Kim & Reeves, 2007).

However, it is not just the interaction with the more capable other that enables the development, but it is also the environment and the nature of the interaction within it which is important to learning development (Vialle et al., 2005). The individual student needs to be actively involved in his or her learning by asking questions and developing answers through collaboration with the teacher and other students. If students assume a more active role in their learning through social interaction, they can discuss complex problems, converse about disagreements, and participate in negotiated understandings of the world (Palincsar, 2005; Vialle et al, 2005).
Shared endeavours with like-minded individuals enhance learning (Palincsar, 2005). This notion proposes that the role of the teacher is to provide collaborative dialogue and assist students in helping each other. For a teacher, to relinquish control of the classroom might be a daunting prospect, and for a student, it may be difficult to acknowledge that a peer may provide an insight into a topic that may contradict personal research. Using this information constructively is another skill that needs to be developed in order for a person to gain benefits from collaborative learning (Dahms et al., 2007). Scaffolding collaborative dialogues to assist students’ understanding of their tasks assists in developing collaborative learning (Dahms et al., 2007). Dahms et al. (2007) suggest that the first step is to engage the learner by building interest. Next, the task should be broken down into simple subtasks. It is important for the teacher to keep the learner focussed on the most important ideas of the task and to prevent the learner from being frustrated. Finally, the teacher should model ways of completing the task which the learner can imitate and internalise. This interaction will assist in the learning of the task. A teacher can teach children through continual collaboration and a readiness to act together (Davydov, 1995).

The social construction of knowledge is not bound by direct face-to-face interaction with another individual. Even individual problem solving may be regarded as a collaborative activity as the “voice of another” (Salomon, 1993) can be used to guide the individual through educational outcomes. The “other” does not need to be present in the same location and shared knowledge does not necessarily require shared physical space (Khu & Hu, 2001). Knowledge can be shared through a variety of means by which ideas and thoughts can be distributed across space and time. Knowledge can be distributed using social, symbolic and physical networks. Social networks are the decisions and discussions by groups and teams that come to a negotiated meaning. The symbolic networks indicate the sharing of cognition through sign, symbols and language that enable us to think. The physical networks include a variety of physical artefacts such as paper and books to technologies such as computers and the Internet (Kim & Reeves, 2007). The utilisation of a variety of networks can extend a student’s opportunity to learn and understand.
As discussed before, communication is essential in collaborative learning environments. Both oral and written communications have significant roles in developing a deeper understanding of the contents. Content and strategies that promote collaborative learning influence the social context’s value or invite interaction and actively engage thinking. Educational strategies that further enhance learning through a social constructivist approach, gives students the opportunity to build knowledge as a collective and derive an understanding from a variety of sources. Language is a versatile “tool” and the use of language in interaction with others is important in most human activities (Wells, 2007). Language helps to shape actions and to reflect on the relationship of those actions and their intended result (Wells, 2007). Language is considered to be integral to the development and functioning of all higher-order processes. It alters the way we perceive the world, remember history and learn (Vygotsky, 1978).

2.2.2 The role of language in learning

Vygotsky placed great emphasis on the importance of language in learning. He suggested that a child develops understanding through both spoken and written speech (Vygotsky, 1978). Language is an essential ingredient in learning and understanding, and is used to determine problems and create solutions. It enables people to regulate their own behaviour and organise themselves. Most importantly, language is a vital tool for communication and sharing ideas and thoughts with others. Students learn more in environments that foster communication with each other (McCallum, Aukerman & Martin, 2003). Students are learners not only of subject matter, but also of ways of engaging with the content (Johnston et al., 2001). A learning environment which encourages students to engage with each others’ “voices”, both orally or through written communication fosters the opportunity to evaluate and contest evidence and teaches a student to listen carefully and respond to how others see the world (Johnston et al, 2001).

Wells (1999) constructed a theoretical framework for collaborative interaction for his research from a synthesis of Vygotsky’s developmental theory to show how language functions to make meaning. He argues for the central role of linguistic discourse in
creating meaning. The framework of collaborative interaction includes a three part pattern (Initiation-Response-Feedback) of classroom discourse, in which the teacher initiates a topic, the student responds, and the teacher offers feedback. Wells (1999) suggests that during collaborative interaction, students build on one another’s contributions “in a manner that advances the collective understanding of the topic under discussion” (Wells, 1999, p. 209). While acknowledging and valuing the students’ ways of thinking about an issue or a problem, a teacher’s questions can direct the discussion to another level of understanding.

As newcomers engage in oral communication with other members of the culture, they are transformed in terms of their understanding and mastery of the community’s practices and in their ability to participate in them; and this, in turn, transforms the community into a learning environment (Wells, 1999). Discussion, through verbal exchanges, gives the individual an opportunity to engage in collaborative interaction. A teacher can suggest a topic and the student responds. The feedback from the teacher initiates another response and the discussion and learning continues. Oral communication (or speech) is an integral part of learning and will be further discussed in the next section of this chapter.

2.2.2.1 Speech and learning

For Vygotsky, speech is the most important “tool” in the social construction of culture (Smagorinsky, 2007). Speech conveys meaning or messages in a variety of ways. Oral communication takes on an exploratory function, which is used to develop a person’s view of the world by enabling them to engage in discussions with others in order to discover the “truth” (Adams, 2008). Speech is used by children to communicate with others who share the environment, and their ideas and knowledge are generated by discussion (Dahms et al., 2007). The discussion helps to clarify the ideas, offer another perspective, confirm thought, or acknowledge understanding. Students can use speech to negotiate their way to a new understanding (Smagorinsky, 2007). It is the way of developing ideas and of exploring thoughts:
Speech serves not only as this means of representing the world; the process of speaking itself often serves as a vehicle through which new thoughts emerge. (Smagorinsky, 2007, p 64).

Expressing thought assists an individual understand his or her own perspective (Palincsar, 2005). It encourages a person to think beyond their original scope and engage in thoughts that may not have been possible without social interaction.

By engaging in interaction with another, a person may experience “disequilibration”, a term used by Piaget (1985) to describe when an individual comes across conflict in their understanding and reconsiders their initial view on a subject. The individual will then search for a new understanding and cognitive development occurs (Palincsar, 2005). “Disequilibrium forces the subject to go beyond his current state and strike out in new directions” (Piaget, 1985, p 10). Communication in this respect, where an individual, through discussion is enlightened to a new understanding, can be viewed on several levels. It can lead to an assimilation of knowledge, where an individual is able to use new ideas to help understand personal knowledge (Chan, Burtis, Scardamalia & Bereiter, 1992). Discussion can also assist in problem solving, during which an individual can use discussion to solve problems by identifying the source of confusion and find a negotiated solution. It may also help in the extrapolation of an idea, when an individual uses the discussion of ideas to evaluate conflicting information to resolve inconsistencies, which leads to the synthesis of a new idea.

Discussion encourages reflection and argumentation which assists in reshaping perspectives and developing understanding (Werstch, 1998). Discussion allows a person to create meaning with another individual, where both parties engage in the learning through two-way communication. This is different to a one-way form of learning, through which information is distributed from text books or a teacher and the student is a passive recipient.

2.2.2.2 Written language and learning

In addition to speech, writing is seen as powerful complementary learning tool (Shy-
Jong, 2007). Writing engages students in making connections between themselves and their knowledge, and assists in assimilating new information with existing knowledge. Written language not only assists as a form of communication, but consolidates knowledge and provides a means for reflection (Burr, 2003). Vygotsky (1962) viewed writing as speech that addressed an absent or an imaginary person or no one in particular. In this latter case the motives for writing are more abstract and more intellectualised and it allows individuals to consolidate their understanding and reflect on their thinking. Vygostky (1962) theorised that,

Communication in writing relies on the formal meanings of words and requires a much greater number of words than oral speech to convey the same idea… Therefore, it must be fully deployed… and expressions are used that would seem unnatural in conversation. (p. 142)

Written communication is monologues and must explain the situation fully in order to be intelligible (Dahms et al., 2007). This demands deliberate analytical action. Writing helps students to search memory and then develop new ideas. It provides a record to which they can refer that is accessible to the student for further reference, as well as available to peers and teachers and other members of the learning community (Syh-Jong, 2007). As Burr (2003) elaborated:

In written speech, as tone of voice and knowledge of subject are excluded, we are obliged to use many more words, and to use them more exactly. Written speech is the most elaborate form of speech. (p.144)

Communicating the ideas through written text requires the learner to reflect on their thoughts before expressing them. Oral communication may not afford reflective thinking or express a person’s explicit thought, but it allows for a quick exchange of ideas and achieving a mutual understanding in a short period of time. Written communication can also remove bias from tone and body language which may alter the receiver’s perception. Thus, written and oral communication is different in the way that they contribute to learning.
Both oral and written communication is an important part of knowledge construction and both can be supported by technology. However, the type of communication enabled by technology is different again.

2.2.2.3 Oral and written language in on-line communication

The type of communication offered through a relatively new medium such as on-line communication allows a person to blend “casual conversation and academic writing” (Murray, 1988, p.351) and can provide a unique opportunity to combine the strength of both written and oral language in a single communication act.

Text-based computer-mediated communication on-line, such as email, asynchronous and on-line chat presents “a different form of linguistics that is somewhere between the written word and face-to-face conversation” (Hull & Saxon, 2009, p. 626). Since thought can be produced and enhanced through the written word, written speech can be used as a powerful teaching and learning tool. On-line communication is a form of written speech, but falls short of the directedness of face-to-face conversation. It also lacks expression and the tone of oral speech (Hull & Saxon, 2009). This has differing implications for learner or instruction because learning is mediated by different members of the group participating in the on-line dialogue. Hull and Saxon (2009) looked at asynchronous computer-mediated communication through writing. When facilitators and the more knowledgeable other support the establishment of shared objectives, they can create a knowledge building community with asynchronous on-line dialogue (Hull & Saxon, 2009). This type of knowledge building community has the potential to overcome the indirect manner of communication between the participants in an asynchronous on-line learning environment. The collaborative construction of knowledge and the inclusion of many perspectives toward a shared objective can establish a socially constructed environment from which understandings are further developed.

Collaborative learning approaches have been demonstrated to improve learning because they encompass numerous attributes associated with effective learning, such as team problem solving. Collaborative learning can be done on-line through written
communication and can be supplemented by oral communication in the classroom. Smagorinsky (2007) suggests that a mixture of oral and written language can be productive in collaborative learning as this allows a combination of a variety of genres:

…people can try out ideas that they might eventually reject, or that will change their thinking about their topic, or morph into a newer more compelling idea. When classrooms are structured so that both writing and speech are exploratory, experimental, and playful, different genres come into play. Both writing and talking to learn are more inviting to students… for the idea is to generate ideas. (Smagorinsky 2007, p 65)

The opportunity to construct an idea based on several sources of information encourages learning. Sharing the ideas through oral and written communication creates more opportunities and technology has the ability to provide these opportunities.

The rise of on-line learning environments has brought to light additional considerations important to the learning experience (Wilson, 2004), such as the absence of spoken words, tones, expressions and gestures which comprise to assist in conveying messages in face-to-face exchanges (McAteer et al., 2000). With on-line learning, the student is often working alone at a computer in a location away from a teacher. However, the on-line learning environment can provide collaborative workspaces that include stored information and resources, as well as written feedback that is permanently available (Wilson, 2004).

Using computer-mediated communication as a tool for learning produces some challenges for education. For example, the method of delivery of instruction to the student without the benefit of oral instruction and the convenience of asking questions of the teacher to check for understanding; students may find it difficult to understand the expectation of the teacher when starting a project. Additionally, on-line environments might provide the limiting opportunities of quality and creativity in the presentation of ideas. Students can only present their ideas in the written form when using computer-mediated communication and may find it difficult to incorporate their personality into the presentation of ideas. The opportunity to apply the best educational
strategies without face-to-face communication is also a challenge for educational practitioners (Wilson, 2004).

Computer-mediated exchanges may also cause some of the effective communication cues to be lost (Abbott, 1994). For example, during audio conferencing, that the lack of visual cues restricts interaction and with video conferencing, the absence of coherent visual feedback diminishes the confidence in the communication of both teachers and students (Cannon & Martin, 1997). Also, with text-based conferencing, the absence of turn-taking which occurs during face-to-face exchange is frequently associated with misinterpretation and a failure to coordinate perspectives (Collis, 1997).

The process of collaboration depends on effective communication skills, in which the parties involved in the communication process continually send information back and forth until an acceptable level of shared understanding has been established (McAteer et al., 2000). In the absence of face-to-face exchanges, using technology in a collaborative learning process may require additional practice to be truly effective and, as McAteer et al. (2000) suggest, feedback may be needed to assist students in developing a better understanding of the content.

In summary, on-line communication presents new opportunities for the learner in terms of communication with people outside of the formal learning environment. It can provide an opportunity to utilise the strengths of written and oral language. Communication is relatively free flowing, such as with oral communication, but with the added advantage of writing, where an individual has the opportunity of collecting and expressing thoughts in a precise manner before presenting them to another person/s. The on-line learning environment affords collaborative workspaces in which work and feedback can be reviewed, and is permanently available. Still, with on-line communication, there are a few considerations that need to be addressed so that the intended message is expressed and received. This is especially so when discussing ideas without the opportunity to see visual cues or body language. An environment needs to be well established so that a social interaction leads to enhanced collaborative learning.
In the following section, the development of technology in the classroom is reviewed with a particular focus on research into the implementation of social constructivist learning environments which utilise technology as the medium for communication. This includes a specific examination of technology used to develop understanding through the collaboration of peers and teachers and expressed in written form. This examination focuses on collaborative writing in which peer and teacher written feedback assists the student to develop a better understanding, rather than collaborative writing whose aim is to produce a joint document.

2.3 Social constructivist learning environments and technology

From the early 1990s, computer technology became influential in supporting social constructivist learning environments, particularly collaborative learning. It has been proposed that the interactive nature of technology can enhance the way teachers teach and students learn, but only if best pedagogic practice is at the forefront of the development and integration of these learning tools (Harper, Hedberg & Wright, 2000; Cuban, Kirkpatrick & Peck, 2001; Kim & Reeves, 2007).

The sophistication of technology and its use in the classroom has evolved with time. From simple drills and skill practice to virtual worlds, technology designers have attempted to offer new ways of supporting learning (Becker, 2000; Jonassen & Reeves, 1996). However, the progressing sophistication of computers has not always translated into advanced learning strategies, or resulted in the anticipated learning outcomes that were expected to accompany the use of technology (Oliver, 2000; Cuban, Kirkpatrick & Peck; 2001). It became increasingly apparent that technology needed to support advanced teaching and learning techniques and that a computer alone could not teach a student to learn.

The following section will examine the use of technology in the classroom as relevant to this study and present an analysis of the characteristics of the social constructivist environment in computer-mediated learning, with a special emphasis on collaborative learning through writing with peers and collaboration between teacher and student.
2.4 Technology in the classroom

Research suggests that there are many barriers preventing technology from reaching its maximum potential in education (Becker, 2000). The greatest challenge in using technology in the classroom is realising its value to learning. Technology innovations often seem to be designed to exploit the technology’s capabilities rather than enhance the learning capabilities of the student (Koschman et al., 1994; Oliver, 2000). Implementing technology requires adjustments to the classroom and school infrastructure, as well as the teacher’s delivery of instruction and reporting of the student’s progress (McNabb et al., 1999). Cost to the educational institution needs to be considered and constant evaluation of the technology being implemented needs to be undertaken (Koschman et al., 1994; Du Plessis et al., 1995; McNabb et al., 1999). While the opportunities for computer-supported learning have increased through greater accessibility and the development of more sophisticated technology, the infrastructure to support teachers and students often remains a barrier (Kim & Reeves, 2007). Cuban, Kirkpatrick and Peck (2001) revealed that in their study the few teachers who did use technology in the classroom could not always employ these tools in a way that would improve learning because of their inability to evaluate student’s progress. Perhaps this was born from the misconception that technology could replace teacher’s instruction. Also, some of the teachers were not able to manage the software and could not assist the students when they encountered difficulties related to the technology (Cuban et al., 2001). As a result, the technology was used to sustain rather than alter existing patterns of teaching practice. This tendency to treat computers as an ‘add-on’ teaching device in a relatively unchanged classroom has been suggested more generally as a major reason for the relative failure of technology in education (Oliver, 2000; McNabb, Hawkes, & Rouk, 1999; Reiser & Kegelmann, 1994). In such cases technology is used to merely provide information similar to a textbook or enable practice through drills, activities which include little or no interaction with peers or teacher (De Corte, 1994). As a consequence, the power of technology to enhance meaningful learning is limited because the technology is used primarily to control the delivery of educational material similar to a teacher-centred approach or behaviourist approach (Oliver, 2000; Du Plessis, Van Biljon, Tolmie & Wollinger, 1995).
It is suggested that much of the disappointing use of computers and technology in the classroom stems from a misguided perception that students should learn “from” computers, in a similar way students learn “from” teachers (Jonassen & Reeves, 1996). It is only in recent times that practitioners have begun using computers for students to learn “with” in conjunction with higher order thinking skills, rather than using computers to learn “from”, such as in drill and practice programs (Kim & Reeves, 2007). The focus on learning “with” technology is derived from the theory of distributed cognition which implies that students are able to engage in higher order thinking by working with artefacts such as computers (Kim & Reeves, 2007).

Over the past two decades it has been argued that technology does not affect thinking and understanding; its effectiveness depends on how the technology is designed and used. For example, technology may be integrated into activities that support the learner to think at higher levels by managing low level tasks:

No computer technology in and of itself can be made to affect thinking. One needs to consider, both theoretically and practically, the whole social and cultural milieu in which instruction takes place. (Salomon, Perkins & Globerson, 1991, p.3)

It follows that while technology can offer new opportunities for learning, learning is also dependent on the mindful engagement of the individual (Salomon, Perkins & Globerson, 1991). It is the intellectual partnership with technology that can allow the learner to engage in higher order thinking such as hypothesis testing, self-regulation, self-questioning and problem solving (Salomon et al., 1991; King, 1989; Pea 1987). Though these activities were not often seen in early technology-based lessons, they were of interest within the research community.

This idea of using technology as an intellectual partner was exemplified by the Computer Aided Education (CAE) system, a CD-ROM based software program that presented students with progressively more difficult problems accompanied by hints when difficulties arose (Du Plessis, et al., 1995). The system allowed the teacher to monitor the progress of the student while allowing the student to develop problem-
solving skills. The student controlled the interaction and the pace of learning, and the system allowed the student to think and rethink his/her actions. This form of metacognition, where the student becomes more efficient about the thinking process through the rethinking of their actions, is integral in the constructivist learning process because it allows the student to build on previous knowledge. While this program was based on a constructivist approach, minimal interaction or collaboration took place. The elaborate design of the program also meant that teachers needed to be trained in the use of the program and how to facilitate learning to ensure that learning benefits were achieved. The authors themselves suggested that this program required large amount of funding and was not necessarily integral to effective learning of problem solving skills (Du Plessis et al., 1995; Kim & Reeves, 2007). There were a number of other suggestions by the authors for further research based on their findings. Most were concerned with the usability of the CAE system and the interface for both teachers and students. They also suggested that a greater array of problems needed to be incorporated into the system to accommodate a variety of different students, so that the computer could provide more interactivity and construction of knowledge with the student.

The chief disadvantage of CD-ROM based programs like CAE was that they allowed for interaction with the computer only. The study by Du Plessis et al. (1995) focussed on the student interacting with the CAE system. Although a teacher was present, the lack of interaction between teacher and student led to a decrease in motivation (Du Plessis et al., 1995)). This in turn affected the depth of students’ learning and problem solving to the extent that high quality learning outcomes were only achieved by very a small proportion of students. It was suggested that interaction and collaboration with peers could provide better learning opportunities, as well as increase the motivation to engage in computer-mediated programs (Mitra & Hullet, 1997; Jonassen, 2000).

An example that typifies a move towards technology as a means of mediating communication to support learning, Land (2004) examined a Computer Supported Collaborative Learning (CSCL) tool designed to create an environment which supported the sharing of information through technology. The CSCL tool being utilised was ‘Co-Net’, a computer-based tool designed to support students in the process of working on design projects. A total of 43 university students took part in the study and were asked
to post their preliminary projects on Co-Net in the second week. Students were asked to comment on their peers work, and during weeks 4–7 students posted advanced drafts of their projects on the program. During this time, peers offered suggestions to each other, and the teacher also provided formative feedback.

A major finding of the study was that the Co-Net program was a powerful tool in assisting learners to elaborate on initial ideas, reflect on their thoughts and evaluate their own designs. The Web based program helped promote engagement in a design community, making available substantive feedback from a variety of sources. It assisted in the early stages of learning when students could view their classmates work and witness how they were producing, reflecting and evaluating their work.

From this study, Land (2004) concluded that the teacher’s role in supporting and managing the learning process of collaboration, and the sharing of knowledge, was invaluable. As such learning was evident only when feedback was substantive and suggestions were made to improve projects. Land (2004) discussed whether the CSCL tool actually produced a more beneficial collaborative learning environment than that of a low-tech small-group discussion. The Web design was found to provide some advantages that would not be available in the traditional small-group work. For example, in a small group there would only be a small number of projects each student would get to see. Another advantage was that some students found it motivational and would keep up their published work and students would continue to add more and more research to their page.

As the study by Land (2004) suggests, the advent of the Internet, network based programs led the way for a different social constructivist environment, in which people could interact with one another and assist each other in learning without being physically located in the same space. Teachers and students not only no longer needed to be in the same location, but in the same timeframe, as teaching and learning interactions could occur asynchronously (Graddy, 2003). Programs became more sophisticated and allowed for continuous electronic communication, with students able to discuss their ideas, share knowledge and collectively solve problems. Internet technologies also allowed students to interact with like-minded individuals and experts
around the world, and in so doing share their experiences, pose questions of others, consolidate their own knowledge and extend their understanding with a great number of people with a broad diversity of knowledge (Kuh & Hu, 2001).

Researchers have begun to explore the possibility of learning in on-line virtual worlds which provide new means of communicating and interacting with others. A recent example of this is AET Zone, an on-line learning environment created for university students who studied off campus (Bronack, Riedl, & Tashner, 2006). This 3-dimensional virtual world allowed students to select avatars to represent them with interaction between the avatars occurring through text or audio. Students could access the virtual facilities hyper-linked to Web pages, view the library, have synchronous and asynchronous chats with members of staff on the virtual campus, and attend the courses available in the virtual world. Often these courses were offered at the same time as real courses, but virtual students could meet at different times according to their schedule. Many students who participated in the AET Zone on-line learning environment provided favourable feedback on the opportunities. One student suggested that comments from other students stimulated learning and thought, whilst another commented on the authenticity of some tasks: “…we create projects that we want to do and that have relevance for us in our jobs” (Bronack et al., 2006, p. 229.). However, the designers admitted that “the program is only as effective as the vision and the pedagogy that guides it”. They concluded that creating communities of practice is essential in the success of programs such as AET Zone. Their work highlights the significant challenges in creating on-line collaborative communities, such as determining what kind of interactions will develop a successful learning environment. Bronack, Riedl, and Tashner (2006) concluded that social interaction between individuals is an invaluable part of learning on-line, but engaging all students over the Internet through social interaction is a challenge which needs further investigation.

Common to many approaches exploring the potential of technology to support and advance knowledge development is a concern with providing environments and thinking tools that support knowledge construction (Jonassen & Carr, 2002). An open learning environment in which students could discuss their thoughts with the teacher and their peers could allow the student to entertain a greater number of possibilities and
so develop a deeper understanding and improve their knowledge. This form of social interaction is considered important in the advancement of knowledge and development of a deeper understanding because it assists in the development of clearer and more defined mental representations of thoughts and ideas, which gradually improve understanding and competency (Salomon, Globerson & Guterman, 1989). Learners receive metacognitive-like guidance in discussions with the teacher or more knowledgeable other and this assists in the development of knowledge and understanding (Slavin, 1996; Palincsar, Brown & Martin, 1987). The key benefits of discussion in developing understanding according to these approaches lie in their support for cooperative learning:

The opportunity for students to discuss, to argue, to present and hear one another’s viewpoints is the critical element of cooperative learning with respect to student achievement. (Slavin, 1996, p 49)

It is suggested that mutual feedback and debate serve to motivate learners to search for better solutions and that collaboration between peers encourages discovery learning (Slavin, 1996). The opportunity to ask and answer higher order questions of more capable peers facilitates students’ understanding and also helps them to organise new material and integrate with current understanding (King, 1989). It should be noted, however, that technology can provide some metacognitive-like guidance through pre-programmed prompts. However, it cannot afford the complex dynamic engagement of face-to-face discussion, and so does not provide responses that promote higher order thinking and understanding of the content. This is because of the limited engagement it provides (Brown, Bransford, Ferrara & Campione, 1983). This observation serves to highlight the importance of technology being designed as a support for interpersonal interaction rather than a replacement for it. Computer technology which supports collaborative learning through written engagement supports interpersonal interaction with peers and teachers.

In summary, the growing awareness of effective and meaningful learning together with the recent developments in technology has led to synergies emerging between the use of technology and the use of effective teaching and learning methods. The Internet shows
particular promise for supporting meaningful learning through its ability to provide communication and social interaction between individuals (Slavin, 1999). The next section discusses the development of specific programs which support communication and collaborative writing via the Internet which have enabled students to engage in social constructivist learning.

2.4.1 Applications of technology to collaborative learning

Applications of technology designed to foster collaborative learning have taken on several forms which have demonstrated successful learning outcomes. Specifically, programs that support students to discuss their ideas in groups that share responsibility for developing those ideas have been shown to be effective. In these cases, students are provided with the opportunity to express and defend ideas and reach a negotiated understanding. The learning processes involved are consistent with social constructivist principles whereby articulation of ideas and collaboration promote greater understanding.

Collaborative learning can produce recognisable advancements in cognitive skills and can prove beneficial for the student when managed by a facilitator. This finding is typical of an on-line learning environment which supports collaboration and is evident in Graddy’s (2003) study examining on-line discussions. This study demonstrated that on-line conversations become more sophisticated as learners interact with each other. Thirteen (13) students studying an economics prerequisite course formed three groups which discussed the content of the course over three different lengths of time. Initially, the three groups discussed content-based material with a facilitator. Then, all three discussion groups were conducted without a facilitator but each group was given exercises to do. Discussion Groups One and Two analysed microeconomics over an eight day period and Discussion Group Three analysed macroeconomics over a four day period. The conversations of each group was examined and compared to the outcomes of the course and to the conversations the groups had with the facilitator. As the course progressed economic concepts and terminology were used more often in discussion in all three groups. This was found in discussion with the facilitator and with each other.
However, when completing the exercises without the facilitator, the terminology used did not reflect a more analytical response and outcomes were not often met.

The discussion in the groups with the facilitator often developed in a “rather pedestrian conversation” (p. 19) because the students directed their response to the facilitator rather than to each other and the conversation with the facilitator was viewed more as homework rather than an attempt to build community discourse. However, without a facilitator, students lacked coherence when managing problems. The students exhibited a low level of activity and a low level of accomplishment.

Graddy (2003) concluded that the role of the facilitator was pivotal in ensuring that students meet the outcomes and that discourse between students is maintained, but the facilitator required extensive training on how to conduct on-line learning environments so that the environment offers more than just a two-way conversation. This research highlights the important role that a facilitator can play in ensuring that the learning process offers students an opportunity to discuss ideas with each other and that knowledge is shared.

Engaging with other students in the learning process is also considered beneficial because it gives students the opportunity to view multiple perspectives and offers the students alternate solutions to problems. By using networked computer systems as part of a social constructivist approach, students can utilise a powerful set of tools to help solve problems, communicate, acquire and evaluate information and think creatively (Dwyer et al., 1990). For example, e-mail, discussion groups, chat and virtual classrooms all offer opportunities for group communication with fewer restrictions on time and physical location. Several key studies illustrative of this body of research will be discussed below.

In an important early study of network-based computer systems in education, Veerman, Andriessen and Kansclarr (2000) put emphasis on interaction and collaboration in their examination of computer-mediated communication (CMC) for learning. Their use of CMC was designed to allow synchronous and asynchronous discussion through electronic communication. The discussions were called ‘Netmeetings’. The authors
believed that synchronous dialogue or collaborative argumentation would allow students to challenge their own and other’s ideas, thereby developing multiple perspectives and constructing knowledge. In this study, students were assigned writing coaches (well-prepared students) to assist them with constructing a written argument and reflectively checking arguments for relevance. The teacher was not an active participant in this study. Veerman and colleagues (2000) examined the electronic discussion to test their assumptions that participants would share multiple perspectives and that the time delay between communications provided an opportunity for reflection and analysis before presentation, thereby optimising student engagement in dialogues for learning purposes. They went further to examine the effective pedagogical interactions of students through a synchronous computer-mediated communication (CMC). The study was conducted in an undergraduate course in educational technology. Data was collected over two subsequent courses; November 1997 and January 1999. In 1997, 42 upper-level graduates participated in the study and in 1999, 26 student were involved. The students’ dialogue was analysed in terms of their constructive and argumentative contributions, and according to their focus on the meaning of the concepts.

Veerman and colleagues’ (2000) concluded from the study that a significant advantage of asynchronous over synchronous communication was that students were not psychologically pressed to react immediately. The authors also suggested that the students needed assistance with focussing on the meaning of the concepts and too often engaged in argumentation. Also, when discussions were entered into, task-orientated discussion seemed to hinder progress and often, because of the lack of face-to-face interaction, ideas were not completely discussed before more questions or irrelevant information entered the dialogue. The lack of coordination of the dialogue stalled social construction of ideas and understanding. It suggests the possibility that teacher’s minimal involvement may have contributed to the lack of information flow because students found it difficult to discuss content in detail.

The results of this study highlight the possibility that, if the communication had been more structured through an organiser such as a teacher, a better exchange of thoughts may have been achieved. Facilitation from a teacher or more knowledgeable other and
more face-to-face communication may have supported effective communication and subsequent learning. The peers as writing coaches did not serve as facilitators because they did not provide direction and accountability of learning. These findings were similar to Graddy’s (2003) who suggested that it is a teacher who can ensure that a learning environment is maintained and managed throughout the task.

The importance of support and facilitation for students engaging in computer-mediated learning has been investigated by several researchers. For example, in an attempt to promote productive collaboration during the learning process, Pear and Crone-Todd (2001) designed Computer-Aided Personalised System of Instruction (CAPSI). Drawing on Vygotsky’s (1978) zone of proximal development, the authors designed a computer system in which students received feedback from more advanced peers, based on the idea that human learning occurs through social interaction. They found through an analysis of the CAPSI-taught course that students evaluating another’s answer in writing assisted both the recipient of the feedback and the marker. Pear and Crone-Todd (2001) explain that the student marker’s evaluation of work requires the highest level of thinking in Bloom’s (1956) taxonomy. Student markers frequently cite examining the work of others in the CAPSI-taught course as a valuable learning experience. This finding is consistent with a range of similar studies in relation to computer-mediated instruction (Pontecorvo, 1993; Verba, 1994; Merrill, Reiser, Merill & Landes, 1995; Rogoff, 1998) that feedback needs to be substantive and of high quality to achieve effective learning.

A key idea from Pear and Crone-Todd’s (2001) study was that the quality of the feedback determined whether any social construction of knowledge could have taken place. They worked on the proposition that if the feedback was minimal and provided little critical analysis of the work (e.g., if the feedback consisted of a simple statement of “very good answer”), then there was little opportunity for social construction of knowledge. Alternatively, if the feedback was substantive (e.g., “Yes, your answer is partially right, but you have not indicated the instructions may influence an individual for delayed reinforcements…”), then the student receiving the feedback has a greater opportunity to benefit from the marker’s comments and alter their response. Pear and Crone-Todd (2001) argued that when using their systems, students received far more
substantive feedback than would be possible in a traditional classroom and that the student markers, in their effort to evaluate other students’ responses, were engaging in the highest level of thinking. In some cases, it was suggested that markers were able to see answers that they had not thought of themselves. While Pear and Crone-Todd’s (2001) design used Vygotsky’s zone of proximal development by asking students to assess and assist their peers, it did not address key issues such as consistency, motivation and purpose of the markers. Also, feedback was given at the end of the task, which limited the opportunities for knowledge construction during the learning experiences.

Common to these and other studies of technology-enhanced collaborative learning programs is the social constructivist principle that the learner should not be a passive recipient of information, but instead, should construct his or her knowledge through metacognitive strategies and interaction (Kim & Reeves, 2007; McNabb, 1999; Du Plessis, Van Biljon, Tolmie & Wollinger, 1995). Furthermore, computers and technology should therefore be open-ended instruments that learners can control and manipulate to assist them in developing understanding and encourage them to think beyond their environmental limitations. This then enables students to make decisions about their mental processes and be active in seeking cognitive support and guidance from the teacher and peers. In addition, social constructivist philosophy assumes that the interface design has to ensure interactivity between the teacher and students and, just as importantly, between student and student (Salomon, 1993).

A substantial gap remains, however, in understanding the effects of technology on student learning (Kuh & Hu, 2001). When used to facilitate the process of learning through collaboration in a constructivist environment, technology should enable students and teachers to do things they would otherwise not be able to do through face-to-face communication, however this is yet to be fully explored. Furthermore, using computers as a medium for supporting communication ranges from very complex scripts to the simple facilitation of sending each other messages (Weinberger, Fischer & Mandl, 2002), which presents a range of possibilities for interaction. If a teacher expects a student to engage in productive dialogue, using computers as a medium is not enough.
The effectiveness of computer-mediated communication is determined by the quality of the interactive process rather than the technology itself (Van der Linden, et al. 2000).

To achieve effective computer-mediated communication, some have called for scaffolding to help learners develop skills in communicating using a medium that can be synchronous and asynchronous at the same time (Johnson, Howell & Code, 2005). This is challenging because although communication through a computer medium allows an individual to have control over their thoughts, similar to the control in written communication (Spiro et al., 1992), the response from another person can be immediate, similar to oral communication. Without the cues of body language or tone to give specific meaning to words, misunderstandings may arise (Johnson, Howell & Code, 2005). Individuals communicating via computers need to develop the skills to communicate effectively so that learning is not hindered by misinterpretation.

In summary, the discussed studies above highlight a significant feature of computer-mediated communication as a particular form of written communication with both written and oral characteristics. This has drawn attention from researchers interested in understanding how these written forms can replace verbal interactions such as classroom discussions (Zumbach et al., 2004). Others, however, have focused specifically on how networked environments and databases can be used to foster learning strategies and skills important in writing and create an opportunity where written documents can be socially constructed. The best known body of work on this particular form of collaborative learning comes from Scardamalia, Bereiter and Lamon (1994) who developed the Computer Supported Intentional Learning Environment (CSILE). The program supported collaborative writing in its most general sense. The focus was on the individual’s learning through feedback from peers and this was evident in the written document the student produced. This work provides the most relevant research base for the current study and is therefore discussed in-depth in the following section.
2.4.2  Computer supported collaborative writing

The Computer Supported Intentional Learning Environment (CSILE) is one of the best known examples of a computer-supported collaborative writing environment, in this case a database-driven computer program designed to support collaborative learning. As noted earlier in this literature review, collaborative learning requires an environment which ensures effective interaction between peers in order to be successful in knowledge building. With the proliferation of technology used for communication purposes, questions naturally arose about how computer technology could be used to support student-student and teacher-student interaction. Scardamalia, Bereiter and Lamon (1994) argued that an environment in which students discussed their questions and answers throughout a task would ensure that genuine social construction of knowledge occurred, thus enabling the student to intentionally learn and therefore produce better results. This principle became the basis for CSILE.

CSILE had its origins in the socio-cultural dynamics of learning. The program was designed to make effective learning accessible to all participants and provide a community space for carrying out this knowledge building work collaboratively. The term ‘knowledge building’ originated with CSILE and represents an integrated framework for knowledge building pedagogies, practices, and environments (Scardamalia et al, 1989). Specifically this meant that students built their knowledge through discussion and collaboration within the CSILE environment with the assistance of their peers and teacher. The students recorded and presented their work through written text which was stored on a database and viewed by members of the class. This allowed students to query each other’s research and findings, and contribute their own thoughts on a topic. The student answered the questions asked of them through further research, thereby using their peers’ contributions to further develop their knowledge. The feedback from the teacher and peers reshaped the individual’s ideas and answers.

The environment was designed to enable participants to collaborate asynchronously at a pace they determined themselves. Together, the participants would be able to build their knowledge and refine their ideas. It was assumed that the nature of the environment would allow students to have a greater involvement in what they learned through the collaboration with other more competent individuals and so reach a better
understanding. The difference between CSILE and other computer-mediated learning programs was that it created a learning environment which supported students to socially construct their understanding by sharing knowledge of mutual interest through written communication with their peers. No other computer-mediated programs of the time were designed to create a similar knowledge-building learning environment. Instead, they tended to be more computer-directed programs that managed the learning environment and outcomes (Jonassen, 2000). Typical educational software of the time were drills or skills computer programs such as the Logo computer program, which provided the stimulus and direction for learning (Emihovich & Miller, 1986), but did not challenge gifted students or support students who struggled with the content (Jonassen, 2000).

A typical CSILE installation consisted of eight networked computers per classroom which were connected to a file server which maintained a communal database. Early implementations used a local computer network, pre-dating widespread availability of the Internet. The communal database consisted of text and graphics which were produced by the students and were accessible using search tools. Any student could add notes or graphics to any other student’s work, but only authors could edit or delete their own work.

CSILE was different to an on-line discussion forum because it also provided students with a private electronic work space where they could develop their ideas before entering their contributions into the communal database. Typically, students were allocated time each day to add their thoughts or expand on previous ideas. Students could also ask questions of other students’ work and/or answer questions directed to them based on their research. As students contributed, commented, hypothesised and predicted it was expected that they would refine their understandings and gradually construct a shared understanding of the issue under consideration. The teacher would provide support during the learning process and ask the questions to keep the thinking moving.

In the research conducted by Scadamalia, Bereiter and Lamon (1994), results showed that school children (in grades 3 to 6) learning with CSILE obtained higher scores on
measures of academic achievement and were better able to provide explanations of what they had learned, portray their knowledge graphically, and solve novel problems, when compared to students in control classrooms. Children in CSILE classrooms also provided fuller and more cohesive explanations of curriculum topics and of selections from their assessment portfolios when interviewed, and produced superior graphical representations of their knowledge. All students in this study had limited prior knowledge and therefore could not utilise experience in solving problems or constructing ideas. However, the students who used CSILE performed better at applying their knowledge in novel contexts and constructing problem solving solutions than students who did not use CSILE. Finally, they performed better on standardised measures of language and mathematics achievement (using the Canadian Tests of Basic Skills), significantly so in the case of language.

Scadamalia, Bereiter and Lamon (1994) provided an example of how students were able to collaborate and go beyond the simplistic transmission of knowledge occurred in an investigation of sponges. A student investigating sponges was asked “how do sponges reproduce?” This led to a note that sponges reproduce three ways; sexual reproduction, budding and regeneration. Other students browsing through the research added a series of twelve notes asking why sponges had so many ways of reproducing. Reasons proposed by the student investigating the sponges included that the sponge was defenseless and the sponge needed a back-up system in case one form of reproduction was unavailable. One student went further and asked why humans do not have several ways of reproducing. The student who posed the question eventually found the answer and explained that the sponge’s relative simplicity allowed it to reproduce through budding and regeneration. Because of the asynchronous writing exchange, the student investigating the sponges had time to investigate the question and search for a scientific explanation, rather than speculate and provide a less accurate answer. This example highlights the importance of this form of written communication for the student in providing time to research and express their knowledge in a response to a question.

Through their research Scadamalia, Bereiter and Lamon (1994) also found that children using CSILE were capable of generating impressive higher-order questions and answers about a new subject, based on their interest and background knowledge. These
questions could then be used to guide students' research and exploration of the topic. This work demonstrated how intentional learning environments could support the high-level, knowledge-generating activity resulting from a question-asking process. Students were asked to explore areas of interest and then were encouraged to make intentional learning avenues to reach a desired outcome, such as a more sophisticated answer to a problem. In summary, the intentional learning environment was a prime objective of the CSILE program and students engaged in this type of environment were able to communicate using writing with greater eloquence, produced greater and deeper knowledge in relation to the content being studied, and were able to construct ideas through the communal database (Scadmalia, Bereiter and Lamon, 1994).

Despite these promising results, other researchers investigating CSILE found mixed success and in so doing discovered some of the potential limitations of the approach. For example, Caswell and Lamon (1998) conducted a study of Grade Four students and their development of scientific literacy using CSILE as a support tool. The students focussed their learning on the Madagascan Giant Hissing Cockroach. Over a sustained period of a full school year, the students progressively investigated the complexities of the cockroach, recording their findings on the CSILE database. The database was also used to ask and answer questions such as, “what did cockroaches evolve from?” (Caswell & Lamon, 1998, p. 7). From these questions, a base of information developed and students researched to find answers and pose more questions.

Caswell and Lamon (1998) demonstrated that the development of students’ scientific thinking was evident through the written abstracts on the CSILE database. The researchers reported that students’ ideas progressed from simple comments to deeper understandings and complex experiments to investigate their theories. For example, they presented the findings of several students who wanted to determine whether cockroaches could learn. The students developed an experiment by creating an apparatus with two doors. At first, the students thought that if they put food behind one door and if the cockroach continually went through the door with food, then the cockroach would have displayed learning capabilities. However, some of the students believed that the cockroach might only being doing this because it could smell the food on the other side. Instead the students introduced the food to the apparatus only after the
cockroach had entered through the door marked ‘A’. Consequently, the students concluded that the cockroach could learn because it could only have known the food would be available through door ‘A’ because of its prior experience and not simply through sensing the food in the apparatus. The teacher as a facilitator was instrumental in guiding the students through their experiments and findings. However, the teacher was careful not to give too much information to the students, but instead prompted students with carefully designed questions and suggestions to ensure learning continued.

A key finding of Caswell and Lamon (1998) was the importance of the teacher in the learning environment. The interaction and communication between the teacher and student came in the form of questions and feedback. More importantly, Caswell and Lamon (1998) believed that the teacher’s approach should be guided by social constructivist philosophies of learning. Specifically, the communication from the teacher in the form of questions needed to provoke thinking and investigation rather than give answers to the student. These questions were valuable in encouraging research and investigation and allowing the students to draw their own conclusions. Also, feedback from the teacher was invaluable in the consolidation of knowledge and pursuit of more answers.

This communication process between the teacher and student gave the student the opportunity to process the teacher’s questions and feedback, and time to gather his or her thoughts and present ideas logically and with clarity. The construction of knowledge with a more knowledgeable other also allowed the students to become “experts” in areas of their interest, so they were confident in sharing their thoughts with peers.

Despite the relative success of CSILE in their study, Caswell and Lamon (1998) observed that some of the students who participated were unwilling or unable to express their thoughts on computer and some students copied information directly into the database without changing it into their own words. Also, with much of the work done in groups, some students did not make many contributions and so may not have developed the deeper understanding of the content that the more avid students did. These findings raised questions about the circumstances under which this approach was effective.
CSILE was later adapted for Internet use to enable a greater flexibility for the participants to contribute to the database, as well as creating greater access for all participants involved in the learning. In a further study, Reeve and Lamon (1998) investigated the use of CSILE over the Internet for which two CSILE databases were used. One database used CSILE over the Internet and it included an intern teacher, a classroom teacher and an undergraduate physics student who, between them, collaborated on the best way to teach the students the physics of flight. The second CSILE database, which also used the Internet, was developed for a group of grade five and six students who examined the scientific principles of flight. The undergraduate physics student was introduced as the physics expert and was available on-line to the students during the learning unit. The study was also used to determine whether having an expert available could assist the students and the teacher to develop scientific knowledge about the physics of flight.

The teachers (intern and experienced classroom teacher) and the physics undergraduate collaborated over six weeks to design the series of lessons the students would undertake in the intern teacher’s classroom. The classroom teacher had taught flight previously and suggested starting with an experiment on Bernoulli’s principle. The intern made a few suggestions on the types of experiments that could be used. Reeve and Lamon (1998) noted that prior to using CSILE, the intern teacher’s goal was to cover the objectives in the curriculum and to impose questions onto the students. The intern did not see collaboration as part of the learning activity.

As the intern used CSILE to discuss teaching and the physics of flight with the teacher and physics student, a gradual understanding of how CSILE might be used to teach students developed. The researchers observed that he began to see his role as allowing the students to develop their own theories, just as his process of learning the principles of flight had developed through collaboration with the teacher and physics undergraduate. This process was supported by careful questioning (by the experienced teacher) and investigation (by the intern) and through the social construction of knowledge with more knowledgeable others (the physics undergraduate and the teacher). Thus, teaching with CSILE was modelled for the intern.
This experience prepared the intern to teach the scientific principles of flight using the CSILE database. The intern then taught the students the principles of the physics of flight using the CSILE database. The intern engaged the students through questions that were on the edge of their competence, and facilitated their learning with suggestions about where to find information. One source for the students was the physics undergraduate, who was able to provide accurate evaluations to the student’s theories.

Throughout the course of this study, students were able to propose ideas about the physics of flight, and debate and argumentation was encouraged. Analysis of student work showed that high level responses resulted in the knowledge-building environment. An example of this was an investigation by the students to determine why more baseball home runs were hit at Coors Field in Denver compared to other ball parks. A student introduced Newton’s Third Law to explain the phenomenon. The quality of the conclusions drawn from the research demonstrated how interactions within CSILE assisted the students in developing scientific ideas of the problems presented to them. Students were able to take time to explore the problem, collaborate with peers and a more knowledgeable other, and present their findings in a clear and logical way.

Both the intern and the students seemed to benefit from collaboration using the CSILE database. The study showed success, however, a limitation was observed in using an expert outside of the classroom. Reeve and Lamon (1998) suggested that all members of the project should be connected to an actual classroom. The members of the class should be physically connected with each other in order to be connected to the real world of ideas and the people who present the ideas. This was especially important in regards to the physics undergraduate. Sometimes the level of response by this more knowledgeable other was at a level that the students could not comprehend. If the responses are too complex, as some of the physics undergraduate’s explanations were, then a student may be too intimidated to reply. Reeve and Lamon (1998) concluded that some students became “turned off” by high level responses from the physics undergraduate. One issue this highlighted therefore is how the more knowledgeable other can adapt their ideas for the students. This suggests that if experts are going to be more directly connected to the classroom, then perhaps mediation of their exchanges with the students needs consideration.
While the study by Reeve and Lamon (1998) demonstrated that students could develop a deeper understanding of a scientific principle based on written collaboration, Hakkarainen (2003) sought to determine whether CSILE could support progressive learning in elementary school students. The study focused on whether the students were able to engage in processing knowledge at a deep level of explanation instead of restricted to surface-level explanations. Progressive enquiry assumes that by imitating practices of scientific research communities, students explore their own questions through the proposal and the evaluation of theories using research. This study differs from other CSILE research in that the onus was on the students to establish their own research and working theories rather than have an existing project to work on, such as the Madagascan Giant Hissing Cockroach (Caswell & Lamon, 1998) and the physics of flight (Reeve and Lamon, 1998). It was anticipated that such a focus would provide students with an opportunity to apply processing skills to construct, explore, and evaluate their own ideas about particular phenomena.

Hakkarainen (2003) examined the progressive inquiry of 28 ten and eleven year-old students. The students worked in groups on a broad area of interest relating to a process in the human body and posted their findings on a CSILE database. Groups were responsible for finding scientific information on their chosen area and posting their ideas and theories on the CSILE database. Hakkarainen (2003) found that over time the students developed a deepened understanding of their content area and arrived at a better understanding of their initial postings on CSILE. However, Hakkarainen (2003) also concluded that computer-supported environments could not produce an inquiry and learning culture without the teacher’s support. Similarly to Caswell and Lamon (1998) and Reeve and Lamon (1998), Hakkarainen (2003) argued that the teacher needed to continue inquiry activities through the facilitation of the learning process and provide careful questioning that would encourage the learners to fill the gaps in their knowledge. The results of the study also suggest that the environment needs to be carefully designed to assist the students in developing solutions to complex problems.

In summary, the studies of CSILE demonstrate that technology can successfully support collaborative learning, but also indicate that more research is needed. Collaborative
learning through discussion and expression of ideas can increase the range and scope of knowledge from which a student can draw (Caswell & Lamon, 1998). Introducing technology supports in combination with specific teaching/learning strategies can enable these approaches. Some approaches have used the computer as a tutor which guides the student through the learning process (Graddy, 2003), while others endeavoured to create a greater range of communication between students through synchronous and asynchronous discussions (Veerman, Andriessen & Kansclarr, 2000). Other studies have attempted to harness the use of the more knowledgeable other by using more experienced students to mentor members of the class (Pear & Crone-Todd, 2001). Still others have altered the environment of the classroom with technology to encourage interaction, or to make the classroom more accessible to the student; i.e. virtual classrooms (Bronack, Riedl & Tashner, 2006). The findings from various studies support the proposition that classrooms might effectively be restructured as communities in which the construction of knowledge is supported as a collective goal, and the role of educational technology can shift classroom discourse patterns towards those having more immediate and natural extensions to knowledge-building communities outside school walls (Scardamalia & Bereiter, 1994).

CSILE was a leading study in relation to using technology as a medium to support collaborative learning. It has been used in educational institutions and investigated by researchers to test its effectiveness as a learning support, and been advanced with the advent of the Internet as demonstrated in Reeve and Lamon (1998). However, the studies that have been examined in this literature review leave some unanswered questions. If Scardamalia and Bereiter (1994) believed that the classroom environment needs to be restructured to provide a more collaborative learning environment, then the introduction of a communal database that enables students to converse about a topic might only be part of the environment. Caswell and Lamon (1998), Reeve and Lamon (1998), and Hakkarainen (2002) argued that a teacher’s guidance is of utmost importance in scaffolding and facilitating the learning process, as well as providing questions which motivate the student to continue their search for answers.

This literature review has revealed that some pertinent questions in relation to computer-mediated learning still need to be answered. The teacher needs to be able to
facilitate the learning process with carefully designed questions and phrases and their presence in the learning environment has significant value. From this research, specific questions have been developed and will be the focus of this research, such as; how effective can a computer-mediated learning environment support both oral and written interaction in a classroom? Does the active engagement in computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content? Finally, what is the student’s personal perspective on the computer-mediated learning environment and do they find value in socially constructing solutions with the teacher and other students?

2.5 Summary

Modern educational theories see learning as a process of social negotiation or collaboratively making sense of theories, mentoring, and joint knowledge construction. Through the process of collaboration, negotiation of meaning helps to shape and define new knowledge, which is constantly, reconstructed as new experiences arise (Davydov, 1995; Cobb and Yackel, 1996).

There have been various types of technology used to aid learning in the classroom. Over time, the sophistication of the technology has increased the scope and speed of information distribution, as well as the opportunity for students to engage in the learning environment. Merging good pedagogical practices, such as those based on the ideas of social constructivism, with technology is paramount for an enhanced learning experience. The key premise of social constructivism is that learning is achieved in the classroom where both writing and speech are encouraged to create an inviting environment for the generation of ideas, solving problems and proposing solutions with others through discussion and argumentation. Computer based, on-line communication provides an environment which allows the student to combine the strength of both written and oral language and therefore to enhance social constructivist learning.

Researchers have investigated technology as a medium to assist in learning by using computer-mediated communication to facilitate social constructivism pedagogy.
Technology has been used to provide more opportunities for social interaction through network-based computer systems (Veerman, Andriessen & Kansclarr, 2000) and also as a way to increase communication in terms of feedback, such as the Computer-Aided Personalised System of Instruction (CAPSI) (Pear & Crone-Todd, 2001). It has been demonstrated that such technology can provide new opportunities for building knowledge through social interaction, especially in a written document where threads of information can show the knowledge building process.

A specific example of technology providing opportunities for the social construction of knowledge is the computer-mediated program called CSILE. CSILE has shown success by devising an opportunity to develop a deeper knowledge of a topic by challenging the student to constantly question current thoughts, either through peer questioning or student questioning (Scardamalia, Bereiter and Lamon, 1994). With the advent of the Internet, more sophisticated computer-mediated environments have attempted to address the issues that limit structure and communication barriers and allow for social interaction to occur with greater flexibility.

Despite these advances demonstrating that technology is a powerful tool with the potential to provide opportunities for social construction of knowledge, more attention needs to be paid to the civic and social goals of schooling and the environment that is created by the use of technology (Cuban, 1998). Questions arise about the most effective environment for achieving an optimal computer educational program which supports social constructivist teaching and learning methods. Computer-mediated learning environments have great potential to enhance the classroom environment. Unfortunately, much of today’s technology emulates the current organisational patterns of the traditional classroom, despite the known limitations of these patterns. It can be seen from this literature review that further research into the effectiveness of the environments created by the technology needs to be examined, together with the opportunities for communication that the environment creates. This will enable educators to pursue alternate strategies of social constructivist learning in education when using technology as a tool to support and enhance learning.
The following chapter will detail the research methodology used in this study to explore questions about the design of a computer-mediated collaborative writing environment, such as the teacher’s support and the opportunity to support a variety of means of communication, that were not closely examined in the studies presented in this literature review.
3 METHODOLOGY

3.1 Introduction

This chapter explains the research design of this study, the principles of the developed computer-mediated, social-constructivist environment (CMSCE), and the methods of data gathering and analysis. In this chapter, the sub-questions listed below are examined closely, which assist in answering the broader question of how a social constructivist learning environment, supported by the CMSCE program can contribute to students’ learning:

(a) What are the characteristics and the balance of the mixed mode (oral and written) communication that is stimulated by this environment?

(b) How does the active engagement in the computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content?

(c) What are the students’ perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and the learner in the project?

The chapter will conclude with a review of limitations and ethical considerations of this study.

3.2 Research design

The purpose of the study was to explore the created computer environment and its effects on learning and understanding of the content studied during the course of this study. The content included topics on ‘physical health’, ‘social drugs’ and ‘physical activity’. The environment was designed to enable the use of written communication, specifically for reinforcement of learning and to embed written communication in the written process of learning and understanding.

In order to examine the effectiveness of the use of CMSCE in this study, a qualitative research method was used. Qualitative research can be used to analyse the effectiveness of particular educational strategies and the learner’s academic achievement (Mertens, 1998). Stake (1994) suggests that case studies can be the preferred research method in
fields of education. Creating a situation where all the limitations and practicalities are identified, will allow the reader of the research to generalise subjectively from the case in question to their own personal experiences (Stake 1994; Cresswell, 1998).

The study was based in a series of lessons in which the students researched and discussed content with the teacher and other students. Each student wrote submissions of their research on the CMSCE program and engaged in written communication with each other and the teacher via CMSCE. The philosophy of social constructivism was the basis of all teaching and learning throughout this study. The students were encouraged to discuss their research with the teacher and other students, either verbally or in the written form on the CMSCE program. The teacher also constantly discussed content with the students and scaffolded their exploration and research both verbally and in a written form through CMSCE.

This study used a case by case analysis of each individual student. The case study approach involves intensive and detailed study of a group or individual through observations, interviews and documentation ensuring accuracy using a triangulation of results (Mertens, 1998). This study examined the effectiveness of the use of the CMSCE in the classroom by capturing and analysing the task related episodes of students’ written and oral communication with peers and the teacher, analysing students’ work and conducting a group interview to gain students’ perceptions of their learning with CMSCE.

3.2.1 Case study approach
The qualitative case study approach has a high prevalence in educational research (Merriam, 1998). A qualitative case study, as described by Merriam (1998), is an intensive and holistic approach which can examine and analyse an applied program or approach in an educational setting.

Merriam (1998) highlights three data collection techniques; interviews, observation and investigation of a primary source as data collection techniques that can be used for case study analysis. The primary source in this study is the students’ written work as well as the audio recordings of the social interaction in the classroom. The cross-analysis of the
data collection methods will assist in producing reliable and valid findings (Merriam, 1998).

A case study approach also allows for the interpretation of interactive data collection, such as social interaction between participants (Merriam, 1998). It also encourages research to be conducted in its natural setting and that each case can be used as a sample for readers of the research rather than a definitive result (Merriam, 1998). Therefore, it enables the readers to apply the research in their own educational setting (Merriam, 1998; Stake, 1994).

3.3 The participants

The participants in this study were from a private single sex girl’s school. The subjects in this study were from a year 11 Personal Development, Health and Physical Education (PDHPE) class which the researcher taught in his role as high school teacher. Nine (9) students, from 15 to 16 years of age, made up the class. According to previous exams, the class was of mixed ability. The unit of work was 8 weeks long and covered approximately 22.5 hours of teacher/student contact time.

3.4 The philosophy of social constructivism

An important part of the constructivist learning environment was the researcher’s teaching philosophy of social constructivism which he applied in his classroom as a teacher. This philosophy is based on an understanding of learning as a result of social interaction, or the co-construction of knowledge.

The questioning technique of the teacher was important in developing understanding and in the nurturing of knowledge. If a teacher only dispenses information, then the student’s learning and understanding will be limited to the teacher’s delivery. A teacher, in an environment which encourages social constructivism, needs to encourage thinking and foster the cognitive process. In this study it was important that the teacher resisted the temptation to give answers.
“as children lead discussions, the teacher provides whatever support each child needs to use strategies, such as, predicting, questioning, summarizing and clarifying” (Palincsar, 2005, p.287).

Palincsar (2005) emphasises that a teacher takes on a facilitator’s role in an environment which encourages social constructivism. This social constructivist philosophy was also used in determining the style of research. Qualitative research was used to interpret a naturalistic approach to its subject matter (Mertens, 1998). The qualitative data collection techniques were open-ended and flexible enough to facilitate the emergence of new categories of meaning and experience. Conducting the study in its natural settings allowed for a stronger external validity (Mertens, 1998).

3.5 Computer-mediated Social Constructivist Environment (CMSCE)

CMSCE is essentially a database stored on a server and accessible by the Internet. The database was created using a program called “Web Objects” and was stored on a server at Wollongong University. The information Technology Department at Wollongong University developed the database based on previous pilot programs developed by the researcher; i.e. the database stored each student’s notes, comments and questions from the teacher, comments and questions from other students in the class and other relevant information such as references and resources. It also allowed for specific privileges to protect the students work such as; only the owner of the note page could edit their work. However, they could not edit the “teacher’s box”. Other students could only write comments in the “visitor’s box” and their name was attached to the comment. The teacher could edit all areas. All members of the class could view all areas of an “owner’s note page”.

Each of the students had their own ‘note page’ to which they had to log in as an “owner”. On this page there were search boxes with which students could search for other students studying similar topics. On the same page was an owner’s note taking box in which students stored their work and a teacher’s box in which the teacher asked questions or made comments on students’ work. Below the teacher’s comments/question box was a visitor’s box. Visitors were able to provide feedback on
the student’s notes. An example of a student’s ‘note page’ can be seen on the following page (Figure 3.1).

The task was based on the CMSCE program. Students had to research a question and in doing so, were encouraged to systematically enter information onto their page. Teacher’s and other students’ feedback were added during the whole period of their work on the task.
The teachers discussed the progress of each student’s assignment and gave advice or help to facilitate the process either through face-to-face interaction, or with written communication through CMSCE.

Each student could make as many submissions through the CMSCE program as they liked and could ask any questions on the CMSCE program or verbally of the teacher and other students during the lessons.

3.6 The classroom arrangement

The study took place in a natural school setting during 8 weeks of a unit study in Personal Development, Health and Physical Education (PDHPE) classes. In the classroom, each student had access to one computer which was connected to the Internet. The CMSCE program developed for the study was available to students from all the computers.

The set-up of the classroom included a centre table in which students could sit and discuss their work. The computers were configured around the perimeter of the classroom so the students were able to discuss their work with the teacher or peers at any time while working on the computers.

Students were encouraged to move around the room and discuss each other’s work. They were also encouraged to discuss their topic with the teacher who was seated at the tables in the middle of the room, or moving around the room talking to students at their computer.

3.7 Lesson design

The series of lessons that were the basis of the task occurred over a term of study. The main part of the task required students to research a topic in an area of physical health, social drugs and physical activity. These questions were taken directly from the school syllabus. The students had the opportunity to choose one of the selected topics or negotiate their own topic with the teacher (see Appendix A). The students discussed their research with peers and the teacher while they attempted to answer the questions.
The teacher explained the purpose of the task (see Appendix B) and the functionality of the CMSCE program. He outlined the procedure for submission of work, receiving feedback and open discussion with teacher and other students.

As part of building a social constructivist environment in the classroom, the main task (described above) was complimented with two sub-tasks which were not based in the CMSCE. The first sub-task was conducted prior to the main task and was designed to scaffold the social constructivist process and prepare the students for collaborative learning. It was used to introduce the students to the philosophy of social constructivism. Students were taught that collaboration and discussion can facilitate the learning process and help develop understanding of content. The teacher encouraged discussion and expression of different opinions, regardless of whether the students were experts or novices on a particular topic. The purpose of this task was to enable the student to see content from multiple perspectives and to shape their points of view, and for experts, to consolidate their understanding when they explain their thoughts to relative novices. This is based on Vygotskian principles of social constructivism and the zone of proximal development (Vygotsky, 1978; Palincsar, 2005).

The other sub-task was completed after the main task to determine whether the student’s knowledge developed during their own task could assist another student’s enquiry. This sub-task involved reviewing another student’s work. Students were provided with a rubric to complete and the purpose of the task was to examine another person’s work and apply their knowledge learned from the main task to an alternative and unfamiliar problem. In developing a synthesis of information student’s understanding was further developed and their ability to apply knowledge was enhanced. This task was a teaching instrument to ensure understanding and was used to examine learning and understanding, and was not part of this study.

3.8 Data gathering methods

To answer the research questions, the data was collected through observations and recordings of task related interactions with the students and teacher; as well as examining students’ work. The research questions influenced the data gathering
methods. Additionally, a group interview was conducted to capture the students’ view of their learning with the CMSCE program.

The collection of the data comprised of four parts:

1. Oral Communication.
Conversations between students and between the teacher and the students were recorded during each lesson on four MP3 players, which were dated and filed onto a database for later retrieval. This determined the students’ proclivity to socially construct information and was based on the observation of socially constructed engagements between students and student and teacher (an example of a transcript can be seen in Appendix C).

2. Observations.
The observations in this study occurred in the classroom. During the observation, the researcher collected data while interacting with the students. This is what is termed a “complete participant” because the researcher is the teacher involved in the classroom and the person attempting to retrieve data (Davis & Ferguson, 1992). On the completion of each lesson, observations were documented. The patterns of interactions, frequency of interactions, directions of communication patterns and changes in those patterns were noted and documented (an example of a journal entry can be seen in Appendix D).

Interactions and social constructivist engagements were identified by the nature of the discussion (i.e. the prevalence of the discussion to the topic being studied) and recorded as field notes.

3. Collection of the student’s written samples
An analysis of students’ written work and their written questions and comments submitted to CMSCE assisted in determining the quality of the learning outcomes and the interaction and communication that occurred during the study. This also gave insight into the process of co-construction of knowledge (an example of a student’s sequence of learning can be seen in Appendix E).
Analysis of the student’s work involved exporting the student’s work and all written comments from the teacher and students from the CMSCE program. The dates of each entry displayed the progress of learning and knowing throughout the task. It also demonstrated the written interactions between students, and between the students and the teacher. Examination of students’ work showed the progress of the students’ learning and understanding throughout the task. Correlation of social interactions and the development of understanding gave an indication of the effectiveness of the CMSCE program and the social constructive learning.

The examination of oral communication, together with observations of social interaction, helped to map out each student’s sequence of learning. The data describes the process of learning from the selection or negotiation of the research questions to how they proceeded in answering the question. It also showed questions and discussions with students and the teacher that may have influenced the direction of learning.

4. Focus Group Interview.
Students were interviewed by an independent person. The interview was conducted as a one large group to ascertain the learning value of the program from a student’s perspective. Students had the opportunity to reflect on the learning process. They were interviewed as a group by another teacher to ensure the trustworthiness of the responses. The interview process was semi-structured and took on a more casual conversation than a formal process. The questions were semi-structured to ensure coverage of important issues, but still allowed for flexibility in responding to other areas of interest or concern (see Appendix F). The questions were mostly open-ended to allow students to freely engage in the conversation and the interview was recorded digitally on an MP3 player. The recording was saved to a hard drive and a copy was transcribed for future data analysis (see Appendix G). Examining the results from another perspective will ensure a more accurate interpretation of the data and the learning experience.

Below is Table 3.1 of collection methods used to assist in answering the research questions.
Table 3.1 Describes data collection methods that were used for each research question.

<table>
<thead>
<tr>
<th>RESEARCH QUESTIONS</th>
<th>DATA COLLECTION METHODS</th>
<th>RATIONALE</th>
<th>ANALYSIS FOCUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) What are the characteristics of the mixed mode (oral and written) communication that is stimulated by this environment?</td>
<td>Observation Documentation MP3 Recordings</td>
<td>• Students will be observed communicating orally during each task. Field notes will be taken identifying collaborative communication. • The students’ hand written work and the notes they write in the program will be analysed.</td>
<td>The characteristics of the written and oral communication will be documented. Students may explain information on their topics, justify their point of view, discuss their concerns or apply their knowledge to a particular situation based on the communications (written or oral) with the teacher, their pair or other students.</td>
</tr>
<tr>
<td>(b) How does the active engagement in computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content?</td>
<td>Observation Documentation MP3 Recordings</td>
<td>• Students will demonstrate their learning and understanding through the documentation of their work and the through the analysis of the sequence of learning. • Observation of the interaction will determine whether the social constructive process has occurred.</td>
<td>The co-construction of knowledge will be reviewed in the student’s notes, verbal discussions and their sequence of learning.</td>
</tr>
<tr>
<td>(c) What are the students’ perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and the learner in the project?</td>
<td>Focus group interviews Documentation Observation</td>
<td>• The focus group interviews gave the students an opportunity to express their views and feelings of their perceptions of learning and understanding through the CMSCE program.</td>
<td>Examining the students’ responses in the focus group interviews, will determine the students understanding of the content and their perception of the process of learning. Positives and negatives will be determined. From this, possible adjustments to the program or the tasks can be made.</td>
</tr>
</tbody>
</table>

Using the case study methods suggested by Mertens (1998), each student was examined individually. Each student was examined independently. All oral communication, observations of interaction, written submissions, and answers to the focus group
interview, were collected for each student and collated into individual sequences of learning. Relationships between patterns of learning, phrases from the focus group interviews and common sequences helped to evaluate the success of the learning and the motivation during the learning process.

3.9 Data analysis

Characteristics of the mixed mode (written and oral) communication

In order to determine the characteristics of oral and written communication across the four categories (discussion, questioning, facilitation and comments) for each participant and illustrate this with a quantitative measurement, the results were examined, tallied and entered in a table.

Endeavours to determine how much communication was oral and how much was written in the learning/teaching process were made through examination of the observation journal, through oral communication recordings and through the examination of each student’s written work and entries to the CMSCE program.

To identify written modes of communication, all written text from student to teacher, student to student and teacher to student were extracted from the CMSCE program. After converting all the information into text and then further converting it into a rich text format, the information was imported into NVivo and coded as written communication. Phrases were identified and labelled and used as the unit of analysis.

The oral communication was identified from all the conversations transcribed from the MP3 recordings. The transcriptions were imported into NVivo and coded as oral communication. Phrases were identified and labelled and used as the unit of analysis.

Finally, the information was categorised and each phrase (oral and written) was assigned to one of four categories:

1. Discussion
2. Question
3. Facilitation
4. Comment
It is important to define effective communication. Because the premise of this program is to improve teaching and learning, all effective communication in this study is based on a teaching and learning context. Determining the characteristics of the modes of communication by distinguishing between social communication, teaching and learning communication and more specifically socially constructive learning is important.

Discussion is defined in the Oxford Dictionary as a conversation or debate about a topic or more typical to this study, a detailed treatment of a topic in speech and writing. This category excluded simple phrases that required no response. It also excluded questions expressed to obtain information, but included questions that were used to encourage further discussion.

Questions had several definitions in the Oxford Dictionary. For the purpose of this study, two definitions were appropriate: one style of question is simply used to obtain information. The other style of question is used to raise an issue for further consideration or discussion.

Facilitation phrases are defined in the Oxford Dictionary as those that assist another in the learning process. Facilitation phrases may be spoken by a teacher helping students pursue a possibility. The statement prompts discussion and further investigation.

Comments are defined in the Oxford Dictionary as remarks expressing opinion. They will only be documented if used in isolation; that is, without requiring further discussion, question or facilitation.

The examination of these categories and each participant’s communication based on these categories was used with other data to determine the characteristics of the communication stimulated by this environment.

3.9.1 Analysis of social constructivist learning

To determine the episodes of social constructivist learning, a sequence of learning for each student was carefully analysed (see Appendix E). Their writing and oral episodes
were examined. Then, evidence of social constructivism between students and between student and teacher was examined.

Theories of social construction and findings from empirical research were used to develop two analytical frameworks which were used to characterise the level of social constructivism and the type of social construction that may occur during the learning process. The level of social constructivism was analysed using a pre-determined criteria as shown in Table 3.2 and the type of social constructivism was analysed using a pre-determined criteria shown in Table 3.3. Each table includes each expert’s definition of social construction of learning.

<p>| Table 3.2: Analytical framework used to identify types of social constructivist episode |
|------------------------------------------|----------------------------------|-------------------------------|
| <strong>Type of social construction</strong> | <strong>Level of social constructivism</strong> | <strong>Authors</strong>                   |
|                             | Level 2. Knowledge/Detail Retelling – assigned to verbatim or near verbatim responses. |                             |
|                             | Level 3. Students are able paraphrase the text and recall personal knowledge related to the text. They can also add elaborative inferences to the text. |                             |
|                             | Level 4. Problem solving – Refers to personal knowledge to explain or interpret new text information. |                             |
|                             | Level 5. Extrapolation – Constructs inferences and hypothesizes to extrapolate knowledge not already known or shown in the text. |                             |</p>
<table>
<thead>
<tr>
<th>Type of social constructivism</th>
<th>Extracts of social constructivism episodes</th>
<th>Authors</th>
</tr>
</thead>
</table>
| Student and student discussion facilitates learning process | - Through mutual feedback and debate, peers motivate one another to abandon misconceptions and search for better solutions.  
- The experience of peer communication can help build a child master social process, such as participation and argumentation, and cognitive processes, such as verification and criticism.  
- Collaboration between peers can provide a forum for discovery learning and can encourage creative thing.  
- Peer interaction can introduce children to the process of generating ideas. | Slavin, R. E. (1996). Research on cooperative learning and achievement: What we know, what we need to know. Educational Psychology, 21, 43-69.                                                                                                             |
| Teacher and student interaction provides metacognitive guidance | Three basic elements in a social interaction may lead from better performance to improved mastery of cognitive skills: the explicit model provided during the partnership with more capable peers, the activation of mental operations that the learner would have difficulty using without the partnership, and appropriate metacognitive like guidance.  
Students who asked more questions of their peers and the teacher were able to solve problems much better. Strategic questions which aimed to clarify understanding and gain insight into a problem were considered problem solving questions and were ultimately used to develop a deeper understanding of the content. | Salomon, G., Globerson, T. & Guterman, E. (1989). The computer as a zone of proximal development: Internalizing reading-related metacognitions from a reading partner. Journal of Educational Psychology, 81, 620-7. |
| Student and student interaction facilitating metacognitive | Self-questioning technique that stem from higher order thinking assist a student in understanding. Questions such as, “how does…relate to…?” and, “what conclusions can I draw about…” can be asked of | King, A. (1992a). Comparison of self-questioning, summarizing, and note taking-review as strategies for learning from lecturers. American Educational Research Journal, 29,                                                                 |
processes themselves when receiving information from teachers or peers. This in turn helps in the social construction of knowledge.

Self and peer questioning that leads to social construction of knowledge. Learners who use self/peer questioning technique are able to analyse content, relate it to prior knowledge, and evaluate it in continuous questioning-answering-questioning cycle. Through this process learners become aware of what they don’t yet understand.

Social construction of knowledge is evident in reciprocal peer questions, task-related questions and higher order questions based on the application, analysis, and evaluation levels of Bloom’s Taxonomy of thinking. These questions in turn prompt individuals to reconceptualise ideas, explain an idea or relationship, apply a concept in new situation, relate new material to known material, providing justifications, drawing conclusions, and the like.

The working of social constructivism can be seen as a higher mental function that was external and social before it was internal. The thought was once a social relationship between two people. Any function appears twice on two planes. It appears first between two people as an intermental category, and then within the child as an intramental category. That is, the shared understanding becomes internalized and is evident beyond the relationship.

Each student’s sequence of learning was examined to determine the characteristics of their engagement in social constructivism. Episodes of social construction of knowledge
for each student were identified and further analysed to determine in which forms of social constructivism the student was engaged and how often.

Each student’s written and oral transcripts were examined and this will helped to determine if the social construction engagements affected their answers/research throughout task Comments identifying social construction incidents were noted if it affected their learning of the topic; i.e. in their writing of answers. If it was shown in their writing that their thoughts had been modified because of conversations with peers or teacher, then each episode of social constructivism was identified with the corroborating definition (an example of analysis of episodes showing social constructive learning can be seen in Appendix F).

Evidence in the written response was used to determine whether the social construction episodes expanded or deepened the student’s knowledge. Examination of these episodes was used to ascertain whether students used this knowledge to help them answer questions, assimilate their knowledge into their answers, or solve problems and create solutions, which determined if the student had developed a deeper knowledge of the content.

3.9.2 Perception of the learning process

The students were interviewed as a group to determine their perception of learning during the study. They were asked questions on the process and the value of the constant feedback and asked to determine if they were able to get a more in depth view of their topic because of the process and how this compared to a normal classroom environment. The interviewer asked about the social constructivist process and if discussions with the teacher and other students about their research benefited their understanding. Finally, the students explained how the program could have been improved to benefit usability and efficiency of work and the social constructivist process, both orally and in the written form.

The information was recorded on an MP3 player and transcribed. Each individual’s response was documented and compared with their oral communication, observation
and sequence of learning to ensure comparability of the student’s response (see Appendix C).

Similarities were highlighted together with unforeseen responses. Also, patterns within the group were recognized and documented.

3.10 Limitations of study

The researcher in this study is also the teacher that teaches in the classroom. As the researcher conducting the study and analysing the data, the opportunity to see things from my own epistemological bias is recognised as an inevitable limitation of this study.

The group of participants comprised of only females from a private school. This homogenous group may only yield specific results related to the group. The make-up of the students may limit the results of this study. Female students are also more inclined to discuss their work and remain on task, and they have relatively few inhibitions about discussing their work with each other. However, another group of students may not have the same work standards, the same focus on task, or the confidence to discuss their work.

The number of students in the study group is small. This allowed the teacher to give constant feedback and afford all students attention and guidance throughout the task. For learning through the social interaction to work, the teacher needs to encourage thinking and foster the cognitive process. A teacher needs to put more time and effort into the learning process in terms of teaching the individual. With a larger group, which is typical of a normal class size, the teacher may not have the opportunity to provide as much attention. However, any constructive feedback, written or oral, would prove invaluable to the development of understanding.

There are also limitations in transfer of this program to other settings. Teaching and learning philosophy may hinder successful implementation of the CMSCE program. The need to scaffold the social constructivist learning method will enable learners to better utilise this learning approach. If students are used to a teacher directed approach,

64
then they may be reluctant to explore content or share their research. Learning to construct understanding with peers can be daunting, especially in mixed ability groups. It would be difficult to administer the CMSCE program into an environment that is teacher directed. Students may reject the style of learning. Also, the teacher in a socially constructivist environment must be prepared to relinquish some control of the learning process. This may be a great paradigm shift for some teachers, especially if teachers are used to teaching towards specific outcomes such as an exam. The teacher must learn the social constructivist way of teaching and learning as much as the students. Perhaps research into scaffolding this teaching and learning process for teachers and students should be explored.

3.11 Ethical considerations

When research is carried out in real-world circumstances, and involves close and open communication among the people involved, the researchers must pay close attention to ethical considerations in the conduct of their work. Winter (1996) lists a number of principles:

- Make sure that the relevant persons and authorities at the school have been consulted, and that the principles guiding the work are known and accepted in advance (see Appendix H & Appendix I).
- Permission must be obtained from the School (see Appendix J), the participating student’s parents (see Appendix K) and the participating students (see Appendix L) before making observations or examining documents produced for this study.
- The wishes of the students who do not wish to participate must be respected.
- The researcher must accept responsibility for maintaining confidentiality. The work they present and the situations they will participate in will remain confidential.
- The students were made fully aware that participation or non-participation would not affect their mark.

All the points above are covered were approved by the ethics committee by the UOW.
3.12 Summary
The research design and the educational setting make a qualitative approach and specifically a case study approach the most appropriate tool in determining the effectiveness of the CMSCE.

Merriam (1998) suggests that a case study approach enables the study to be conducted in its naturalistic setting. Stake (1994) also explains that the reader can better utilise the educational process in a regular classroom without too many alterations. Whilst there are some limitations in regards to class size and available resources, the principles of the study can still be applied to current teaching and learning settings with some modifications.

The data gathering methods ensures the triangulation of the research; i.e., the combination of data collection (examination of oral communication, observation of social interaction, analysis of data entries and examination of the interview which details the students’ perception of their learning) enables a more comprehensive analysis of the data.
4 CASE STUDY ANALYSIS

4.1 Introduction
This chapter presents the analysis of each student’s learning through the computer-mediated social constructivist environment (CMSCE) program in the main task (Task 2). Each case study has been constructed from an analysis of student’s written work in the CMSCE program, audio-taped and transcribed oral discussions, and observations documented by the teacher in his field notes.

The cases for each student are structured as follows:

The first section examines the student’s sequence of learning from their initial questions to the development of their understanding of the topic which was presented at the end of Task 2. Each student had the opportunity to choose questions from a list set by the teacher, or negotiate their question/s with the teacher based on a set topic. The sequence of learning includes entries of data into the CMSCE program, feedback (both oral and written) given to the student by the teacher and peers, and questions the student asked of the teacher to assist in the learning process. It also includes analysis of the development of content understanding and knowledge as a result of these discussions. Assignment entries were also examined to analyse the progress of the learning throughout the task. A minimum of one assignment entry was expected of each student. There was no maximum number of entries.

The second section analyses the student’s task-related communication. It determines the forms of communication used (oral or written) and the modes of communication (discussion, question, facilitation, and communication) used. It was important to examine the modes of communication as a means to determine whether social construction occurred and to what degree. All written communication was noted in the CMSCE program and all oral communication through audio recorded conversations.

The third section discusses each student’s proclivity to socially construct knowledge. Students exhibited different levels of ability to use discussions (orally or written) to
assist in answering questions. If a student sought information from teachers or peers to enhance their knowledge of their topic, she was judged to demonstrate a high proclivity to discuss information. Evidence for this was identified in the student’s written entries to determine to what extent the information a student presented was enhanced as a result of a verbal discussion or feedback given through the CMSCE program. This section also analyses any socially constructed episodes. Any interaction that resulted in the information being used to augment current knowledge was considered ‘socially constructed’ information. Levels of socially constructed information were created using existing research (see chapter 3, table 3.2). This process was used to differentiate between a student who simply refined other people’s words, and a student who used the discussions to modify her understanding and develop a deeper understanding of the topic. Further analysis was made using various forms of interaction to define different types of social constructivism (chapter 3, table 3.3). A combination of documented interactions (oral and written) and the analysis of the assignment entries (written work presented by each student) were used to determine the social construction of knowledge.

The fourth and final section examines the student’s reflection on the learning process. This analysis is based on a focus group interview which assisted in examining the student’s perceptions of the program and how it assisted her with the learning and the understanding of the content.

The analysis is followed by a discussion of the results.

4.2 Sara

4.2.1 Student’s sequence of learning
Sara chose a question from the selection created by the teacher on physical activity. The question asked Sara to critically examine the amount of physical activity needed to incur health benefits by investigating the following sub-questions: How much physical activity is enough? Is this the same for all people? Does fitness equal health? And, can physical activity be dangerous to health? Sara was also asked to explore the role of physical activity in the development of physical, social and emotional outcomes (for example the
reduced risk of certain diseases, increased self-esteem, and broader social networks). From her research, Sara was asked to draw conclusions about the factors influencing participation in physical activity.

Sara made a total of six separate written assignment entries throughout Task 2. Her initial entry included an explanation of physical needs of children and the physical activity guidelines provided by the government. She also explained some of the government initiatives to encourage children’s participation in physical activity and identified the after school program, “Active Australia”. Her research also identified the benefits of physical activity and some of the ensuing mental and social benefits that result from physical activity. Whilst this entry was extensive in terms of volume, it was submitted in point form and was of a descriptive nature.

The teacher wrote an extension of the original question on the CMSCE program, asking Sara to investigate the correlation between thinking and exercise. Sara’s next two entries were more detailed than the first. She explained how physical activity can enhance thinking skills. For example, she wrote:

It is believed that by partaking in physical activity it helps to reduce stress levels, and due to a vigorous work out as it increases our heart rate and helps to regulate blood flow to our brain, we become more mentally alert and sharp, enabling one to feel more fresh and think clearly especially when it comes to decision making and planning.

It was apparent in the response that Sara had conducted research on her topic, but it was evident in Sara’s oral presentation to the class that she did not understand the information she put forward. For example, during her presentation, Sara was asked questions based on her research. One such question from Lisa enabled Sara to demonstrate her ability to remember and recall factual information. Lisa asked Sara whether blood flow increases the thought process. Sara was able to answer correctly from her research saying, “…it does… because the oxygen supplies the brain with fuel, therefore enabling it to produce clearer and more coherent thought.” However, when the teacher asked Sara if she could explain how or why oxygen provides fuel, an answer
requiring deeper knowledge, Sara was unable, at this stage, to provide an adequate response.

It was evident from her references that most of Sara’s information had come from Internet sources. She had restructured evidence that she had researched and explained it in her own words. However, critically analysing a question requires a student to examine a question in detail and provide critical opinion based on the research. It requires exploration of the concept to find essence of the problem. Initially, Sara had trouble demonstrating this form of reasoning. Assistance from the teacher enabled her to provide some critical analysis in her response. Towards the end of the task, in her final entry, she explained the benefits of physical activity when she wrote:

   Physical activity allows you to explore different opportunities and stretch your previous boundaries and by doing this you will experience improvements in all five dimensions of your life. The above improvements may not include all of the 5 dimensions of health, but inadvertently physical activity will benefit a person’s well-being. … Studies are still being conducted and will continue into the future as to how physical activity and participation into it benefits oneself.

While her response was limited in its findings, it was evident in this entry that Sara’s understanding had developed over the duration of this task. Sara’s answer involved multiple dimensions of health and included culture and social factors that impact on health. She also referred to on-going research, which indicates her understanding of the relative and dynamic nature of knowledge she discussed.

The following extract from the CMSCE program indicates that Sara had identified many factors that may influence a person’s inclination to participate in physical activity. She demonstrated an understanding of the factors by linking society’s perceptions as an influence in her explanation:

   Family is considered to be a major influence upon developing minds of young children. Another factor that influences one’s participation in physical activity is gender, even in today’s society, gender means
perceptions and understandings as to each gender’s role in society. Boy’s expectations in physical activity are different compared to girls. Even in competition boys are seen as the better athletes and are portrayed as more dedicated and skilled than their female counterparts. This image is passed onto younger viewers/spectators. These factors will have an influence though it will not determine the final conclusion.

This was a more in-depth response than her earlier entries. Her research showed a higher level of investigation and analysis. For example, in the following extract taken from her final entry, Sara presents scientific reasons for the positive relationship between physical activity and thinking:

Exercise triggers the release of BDNF; a brain-derived neurotropic factor that enables one neuron to communicate with another. Students who sit for longer than twenty minutes experience a decrease in the flow of BDNF. Exercise engages emotions which drives the attention for learning.

Sara’s progress through the task shows that, initially she did not use discussions with her peers or the teacher effectively. Her early responses were superficial and of a descriptive nature and did not display reflective thought. However, discussions with the teacher enabled Sara to express a greater depth of knowledge in her answers. Feedback and interactive dialogue assisted Sara in developing a more sophisticated understanding of the content which was evident in her final assignment entries. This section describes the communication in Task 2 from Sara to the teacher and to her peers. It includes both oral and written communication and the different modes of each communication. Table 4.2 presents the number of Sara’s meaningful task related phrases used in individual and group communication with teacher and peers.
4.2.2 Sara’s task related communication

Table 4.2 Sara’s communication to the teacher and peers.

<table>
<thead>
<tr>
<th></th>
<th>Written (Total 1)</th>
<th>Oral (Total 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Sara’s communication during Task 2 was mostly spoken and consisted of questions (8 phrases), discussion (7 phrases), comments (5 phrases), and facilitation (3 phases). She did not use the CMSCE program to communicate with other students and used only one written discussion entry during the entire task. Sara’s written communication was to the teacher and was a strategy to keep up with work after she missed two lessons in a row due to sickness and needed to discuss her question with the teacher. Her entry puts forward an idea about how to address the question from the teacher, which asked her to determine if physical activity benefits thinking. She wrote:

I have found some information relating to thinking and physical activity, but I think it is important to include the dimensions of health to explain all the positive effects of physical activity first. Let me know what you think.

This discussion assisted Sara in her attempt to answer the teacher’s question. The interaction enabled Sara to see that health is not just physical, but also mental, emotional, and social and all the dimensions of health are interrelated. It was fortunate that the CMSCE program provided an opportunity for Sara to stay in contact with the class.

All of Sara’s questions were also directed towards the teacher and often the questions required a limited answer rather than leading to further communication. A typical question that Sara would ask the teacher after receiving feedback was, “Do you want me
to find other reasons [why physical activity is important]?” This question did not seek to find a deeper understanding of the topic, but rather just instruction, which was typical of Sara’s questioning early in her research.

Frequent prompting from the teacher was used to encourage Sara to develop a deeper understanding of her topic. In a recorded conversation in class, Sara asked the teacher if she needed to include additional reasons to determine whether exercise was beneficial for health. The teacher requested that Sara include some physical reasons. The teacher said that Sara had given social and emotional reasons, but now needed to include scientific proof.

Towards the end of the Task 2, Sara engaged in oral discussion style episodes with her peers, which enabled her to understand other students’ topics. In an exchange with Lisa, she developed an understanding of a government initiative to get children to become more active and reduce the risk of obesity. Lisa said, “…the government gives a grant to the school and the money pays for the coaches, fruit and water.” Sara responded, “…that’s good. What are they doing that for?” Lisa explained, “To get children physical active and eating healthy. The government teaches the coaches how to manage it and hopefully develop good habits in children”.

Sara’s communication was relatively limited compared with the rest of the class. She used oral communication more frequently than written communication. Her inclination to discuss her topic increased towards the end of the task and her tendency to interact with the teacher became more pronounced. Her discussions with the teacher included aspects of her research in which she required confirmation of her thoughts.

4.2.3 Evidence of socially constructed episodes and development of in-depth knowledge

Early in Task 2, Sara did not tend to initiate discussions about her topic with her teacher or peers and worked independently on her research. Whilst there were conversations about physical activity (her topic) in which she participated, Sara did not appear to develop theories and ideas from these incidental discussion. One discussion which happened between the teacher, Sara and Lisa did not seem to influence Sara’s research.
The conversation centred on government initiatives to increase physical activity in young children. It began with Lisa describing to the teacher a government advertisement that she had seen on television:

Lisa said, “…the getting active advertisement with ‘the red chair’ is a government initiative. It says so at the end of the commercial.” The teacher replied, “That is part of a big campaign. Another one of the government's initiatives is ‘Active Australia’. We do ‘Active Australia’ at this school. Students in the primary school have the opportunity to be active for one hour and play. They are also supplied with fruit and water…”. Sara said, “…do children exercise for an hour? I found on a website that it says you only have to exercise a moderate amount. What does that mean? Will the students in primary school understand the meaning of the exercise?” The teacher replied, “If you look up the government’s initiative in increasing physical activity amongst young children, you will find the reasoning behind the strategy. Let me know if you agree”.

Sara produced the following assignment entry in response:

Research show that children need at least an hour a day of moderate to vigorous physical activity…the Australian government recognises that we must have a balanced approach towards nutrition and physical activity to promote healthy habits for life. The current initiatives that are in place are aimed at young children within the community, encouraging them to take part in physical activity. Such encouragement is promoted through their schools, where after school fitness programs are provided at no cost … The current initiatives are aimed at young children because healthy and active children live and learn better and grow up to be more active and healthy adults thus influencing future generations.

This was typical of Sara’s early assignment entries. The entries were descriptive in nature and Sara did not include any analytical sentences in her response.

By the end of the task, she produced more analytical responses, demonstrating greater depth of knowledge and understanding. A discussion with the teacher suggested that
physical activity provides benefits in all the dimensions of health, but also has the potential to cause harm to a person’s health. The following extract demonstrates how Sara developed her understanding of the content by extending her research beyond the initial question, prompted by conversations with the teacher, rather than just reciting information as she was doing earlier in the task:

Physical activity benefits all areas of life, not only physical, through new experiences and friendships... A combination of factors ensures that an individual will have a greater level of health and a high quality of life if they are physically active. However, over exercise can interrupt the balance and cause harm to the body rather than good. The relatively new disorder of “bigorexia” practiced by men who work extraordinary hours in the gym not only harms their physical health, through lifting too heavy weights, but also their social health by spending too much time in the gym and not with friends and family.

The excerpt demonstrates Sara linking the scientific research with the holistic aspects of health and shows she was able to explain why physical activity is part of a balanced lifestyle. This change in Sara’s responses was the result of a conversation with the teacher which centred on the science behind the benefits of physical activity and the need to provide balance in life to satisfy all the dimensions in health.

Sara’s engagement in episodes of social construction throughout Task 2 occurred mainly through teacher-student verbal interaction in which the teacher provided guidance through questions and suggestions (see table 3.3). This method of social construction has three basic elements of social interaction and led to Sara’s improved mastery of these cognitive skills. According to Salomon and colleagues (1989), these three elements include the partnership with more knowledgeable peers, the activation of thought as a result of the partnership, and guidance through content with a more informed individual. The explicit model provided during a teaching-learning partnership with the teacher encouraged the critique of research that Sara would have had difficulty achieving without the teacher’s feedback. Sara’s experience exemplifies this process. For example, the teacher asked Sara to explore research relating to exercise and
thinking. The teacher suggested that there are many situations in which students are forced or choose to focus on study rather than to exercise. Sara wrote in reply:

When people exercise, they go into a homeostatic state where the chemicals of the brain, hormones, and electricity and system functions are balanced. When the body and/or brain are out of balance, it is an outcome of poor nutrition and lack of physical activity causing the body to function at less than optimal levels.

This excerpt shows Sara using her knowledge based on her research to answer the question. She explains that the body, with exercise, maintains an internal balance which enables all the systems, including the brain, to perform at optimal levels. Without the teacher’s assistance, Sara may not have made these links in her research.

More evidence that assistance from teacher was beneficial came from Sara’s answer to the question which required her to critically examine the benefits of physical activity, to which Sara delivered her answer in point form. In order to encourage Sara to develop a more in depth view of her topic, the teacher asked her to find some scientific research that supported increase thinking because of physical activity.

This following extract shows that Sara has found scientific research to support her early information:

Exercise engages emotions which drives the attention for learning. Inside the brain’s emotional filter (amygdala) touches the basil ganglia that interpret movement. Therefore, emotion and motion are connected. Movement can foster self-discipline, self-esteem, increase creativity and enhance emotional expression through social games. Research suggests that mental stress and anxiety can rob the brain and body of adequate oxygen by interrupting our normal breathing pattern.

The extract shows that Sara benefited from specific direction, because she was not curious about her topic. Sara’s construction of knowledge came mainly from
discussions with the teacher, and, while the rest of the class engaged in conversations relating to her topic, Sara did not seem to be inquisitive enough to develop theories and ideas from the incidental discussion. She required the teacher’s guidance to develop a deeper level of knowledge about her topic. There was no evidence that Sara’s social construction of knowledge extended to the level of problem solving.

4.2.4 Student’s reflection on the learning process

Sara was an active participant in the group interview and expressed her views on the learning process. She said that she had enjoyed the learning process, and suggested that the constant feedback from the teacher helped her extend her research:

> Every time we would do something in class, in the next lesson at the bottom of our assignment was feedback on what we need to improve on, what we need to research more into… and the teacher would give us a new question or guidance if we needed it.

Sara also mentioned that she enjoyed the discussion process with the teacher because she needed to have a better understanding of the topic to explain it to other people. She also suggested that the constant review of the topic with the teacher and other students encouraged her to develop a greater depth of knowledge on the topic:

> It was interesting because obviously they would have to put in their ideas, but because they have better understanding of it, they would explain it better to get to understand it more.

In terms of usability, Sara believed the program was easy to use and thought the program could also be used across other subjects:

> I think it would help in English because like some people may have problems with that structuring type of response for example an essay and you’d do it on that internet based program like that would be really good. You would know what to improve on and expand on. You know you’re on
the right track and you can develop your ideas further immediately instead of just handing something in that you hope is right and come back and find out that it’s all wrong.

Sara enjoyed developing her knowledge in conjunction with the teacher and her peers.

4.3 Jenny

4.3.1 Student’s sequence of learning
Jenny’s sequence of learning started with her choice of topic. Her question focused on the harm caused by drug abuse. She negotiated her question with the teacher and they agreed that her focus would be on alcohol abuse. Additionally, Jenny needed to investigate government strategies that have been implemented to reduce the harm of alcohol and from this examine alternatives to the government strategies.

Jenny made a total of six assignment entries in her attempts to answer her question. Her first assignment entry focused on the minimisation of harm from alcohol consumption and described the Australian government’s National Alcohol Strategy for 2005-2009. Her response detailed the responsibilities of the government and the necessary assistance needed from the community. The teacher explained to Jenny that the strategy stemmed from a conference convened in Ottawa and then, in written feedback, the teacher asked Jenny to examine the charter which was developed from the conference and analyse how Australia has used it to minimise harm from alcohol.

Jenny’s second assignment entry included statistics and identified the groups most affected by alcohol abuse. The information came from the National Alcohol Strategy. Jenny explained in her assignment entry that the statistics were even more alarming than the information published in newspapers. She suggested that the media reports mainly on isolated incidents and that the true nature of the problem cannot be determined through the media alone. She wrote:

Alcohol is the most widely used and abused drug by teenagers. Around 72% of Australian teenagers have tried alcohol at least once. Alcohol is
mostly tolerated as an acceptable drug, as it is seen as not as serious as illegal drugs such as marijuana or heroine. Alcohol is most responsible for drug-related deaths in teenagers. It is associated with a variety of serious health risks. It is estimated that half the population over the age of 14 drinks alcohol at least weekly.

Jenny’s third and fourth assignment entries concentrated on the Ottawa Charter which includes five action areas. She described one of the action areas, “Developing Personal Skills”. The ensuing verbal discussion with the teacher enabled Jenny to gain a better grasp of this section of the Ottawa Charter. Jenny, in a discussion with the teacher, asked if Developing Personal Skills essentially meant education in schools. The teacher acknowledged this idea and added that it also meant giving people the knowledge to make educated choices. Jenny showed her understanding of this comment by suggesting that the government had assisted the Australian people, through the media, by educating them in detail about the consequences of alcohol abuse. For example, advertisements warning that drink driving may lead to an accident and possibly death.

This style of verbal discussion with the teacher was typical of Jenny’s topic-related exchanges. On each assignment entry she enquired about the purpose of each action area of the Ottawa Charter. She often gave examples, relating to the minimisation of harm from alcohol consumption to clarify her understanding. For example, after her fifth assignment entry, the teacher said to Jenny, “Some of your examples can be used across different action areas. Some of the government strategies are used in both Creating Supportive Environments and Strengthening Community Action which are action areas of the Ottawa Charter…it depends how you explain it.” Jenny replied, “With Strengthening Community Action, is that the community creating safer environments?” The teacher replied, “Yes, that is right. Creating Supportive Environments is the government creating an environment that is conducive to the initiative. It gives people the opportunity to lead a healthier life.” Jenny showed her understanding by providing an accurate example, “Is that like pubs? The initiative where the designated driver gets free soft drinks all night?”
The sixth and final assignment entry included extracts from police and the media that shows success and failure in the government’s use of the Ottawa Charter. Jenny also wrote a concluding statement based on her research, “…the responsibility of the minimisation of accidents resulting from alcohol related incidents does not just lie in the government’s hands, but also with the people that they are trying to protect.”

4.3.2 Jenny’s task related communication
This section describes the communication from Jenny to her teacher and to her peers in Task 2. Table 4.3 presents the number of Jenny’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.

Table 4.3 shows Jenny’s communication to the teacher and to her peers.

<table>
<thead>
<tr>
<th></th>
<th>Written (Total 6)</th>
<th>Oral (Total 67)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Question</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Jenny’s communication during Task 2 was mostly spoken and it consisted of discussion (24 phrases), questions (18 phrases), comments (14 phrases), and facilitation (11 phrases). She wrote 4 discussion phrases and 2 facilitation phrases. The written discussions were used during the first two lessons and following these lessons, Jenny’s discussions were only oral.

Jenny engaged in repeated oral communication, however, she did not use written communication as much, possibly because the access to students and teachers in the classroom was relatively easy and immediate.
4.3.3 Evidence of socially constructed episodes and development of in-depth knowledge

Jenny frequently engaged in communication with the teacher from the very beginning of Task 2. Her inclination to discuss her topic with the teacher and use this information in her work was evident in the analysis of Jenny’s task related communication. Examination of her discussions with the teacher and her resulting, subsequent entries onto the CMSCE program, provided evidence of Jenny’s development of her answers in close communication with the teacher. For example, in the following exchange, Jenny asked the teacher, “What is Reorienting Health Services?” to which the teacher replied, “Reorienting Health Services is professional people going into schools or the work place and educating people on preventative measures”. Jenny showed her understanding by giving an example relating to her topic, “Like police going to schools educating about drink driving?” The teacher then confirmed Jenny’s perception of the concept, “Yes, they go into schools educating people on the consequences of drink driving. This will hopefully prevent harm caused by alcohol.” Jenny's following assignment entry reflected this exchange and she was able to explain her topic in more depth:

A large effort needs to be put into improving the uptake of screening, assessment and brief interventions, as the government has found, these have been found to be cost effective and can be delivered in a wide variety of health care settings. Reorienting Health Services is used by the government in a variety of ways. General Practitioners, practice nurses and Aboriginal health workers are ideally placed to deliver the interventions. For example; hospitals are also taking part in the initiative by providing opportunities for interventions such as screening and referrals in their Accident and Emergency departments. In doing so, more lives can be saved from alcohol-related accidents, injuries and health problems if they can be treated effectively shortly after their onset.

Jenny used the discussion with the teacher to further develop and confirm her existing knowledge. She drew conclusions and proposed possible solutions as a result of the discussions. For example, this extract follows on from the above example and shows Jenny highlighting deficiencies of the government initiatives:
However, attention needs to be paid to developing numbers in the specialist drug and alcohol workforce to deliver alcohol treatment. Workers need to be trained and sent out to communities to provide their services. Vulnerability of the higher risk groups (for example young people, Aboriginal and Torres Strait Islander people) has been partly put down to lack of access and opportunities to appropriate services.

Jenny’s further discussions with the teacher helped to develop her knowledge and understanding of her topic and enabled her to ask questions to qualify her thoughts and gain a deeper understanding for newly developed concepts. For example, Jenny negotiated an understanding of the action areas of the Ottawa Charter. She derived an understanding from text books, but after conversations with the teacher, she was able to confirm her understanding of some action areas and slightly modify her understanding of others. After further discussion, she was able to apply the action areas to government initiatives and successfully propose strategies the government might use to better utilise the Ottawa Charter as a framework for better living.

Jenny’s discussion with the teacher helped clarify her misconceptions which in turn helped her produce excellent answers that could be applied to real world contexts. Without this type of guidance, Jenny may not have been able to generate such high quality answers (Salomon et al. 1989 and King, 1991), (see table 3.3). For example, as described in Jenny’s sequence of learning, she confused two of the action areas of the Ottawa Charter. The teacher commented that the two are very similar and many examples cross over between the two action areas (‘Strengthening Community Action’ and ‘Creating a Supportive Environment’). After further discussion, Jenny was able to separate the two and provide a more appropriate example to explain the differences between them. She was also able to successfully identify government actions that supported each area. This was evident in her two subsequent assignment entries in which she modified her explanations and added better examples to illustrate her understanding.
Whilst Jenny’s most meaningful discussion to refine and clarify her understanding of her topic occurred with the teacher, she also engaged in collaborative learning with her peers both as an expert and a novice on several issues. This is consistent with findings of Slavin (1996), who demonstrated that collaboration between peers can assist in clarification of thought and the generation of ideas. For example, Ann asked Jenny what she was working on. Jenny told her that it was the Ottawa Charter, which she describes as a framework that reduces the risk of alcohol related trauma (explained as an expert). Ann asked if the Ottawa Charter just applied to alcohol and Jenny explained that it was designed for health related issue, including drugs, which was pertinent to Ann’s topic.

Jenny’s continuous engagement in discussion of topics on a variety of levels, as an expert or novice, helped her in completing Task 2. As a result, she demonstrated a great depth of knowledge throughout her answers and consistently provided high quality responses, verbally and written. Her ability to synthesise her knowledge in a variety of contexts also showed her depth of knowledge and understanding of the content studied. This is supported by Jenny’s own reflection of her learning in Task 2.

4.3.4 Student’s reflection on the learning process
Jenny expressed her appreciation of the learning process and made the point that constant discussion with the teacher had helped her develop a deep understanding of the topic. She said:

We did one lesson where we just sat around the table and we just had to basically talk to everyone else and discuss what we were doing and then they could ask us questions. That was really good because it required you to have to be able to, not just like regurgitate what you’ve done, but to really know what you’re talking about and if they ask you questions then you had to be able to answer it on the spot. …The thing was, it required your own opinion as well… whether you think it’s good or if it’s bad what do you think they should be doing. So, once again, it related back to like your own interest in the topic and that you can almost say what you want in it.
She went on to say that the teacher had facilitated the learning process by explaining things along the way to ensure understanding, which, consequently, enabled her to progress effectively. She said:

He [the teacher] definitely helped. With the thing I was doing you sort of had to apply, the Ottawa Charter and the very first thing he did was like explain it… this stuff actually fits into here and he sort of explains it along the way as well through the program. So my overall understanding is really deep now.

Jenny enjoyed discussing her topic with the teacher and peers and felt she learnt much from her peers and made some pertinent points in the group interview about learning with other students:

In the last section, we could go back into our pairs and put our knowledge together to complete the final part of the task, so we had to know what each of us had done and it all tied in together. ... by talking to other people you can correlate all the different ideas together so you can look at one thing from like nine different perspectives which is better than just one - the teachers perspective. …I like hearing about what other people were doing because basically you’re sort of learning about it.

She also suggested that because of the constant interaction the task did not seem as difficult as it might have been and the atmosphere of the classroom was conducive to learning. She suggested:

It didn’t seem as much as a chore. If we’d been given the assignment and he had said, go home and do it its due in two weeks, I would have ended up doing it another time and done a bad job. But it feels like the entire environment was so relaxed and because we could help each other and stuff it just became a lot, lot easier. I had more motivation and for once in
my life I got the assignment done before it was due and I haven’t read over it since I submitted it, but I know exactly what I said in it, I know the topic like the back of my hand, whereas an assignment I handed in yesterday I would have no idea what I put in it by now.

Jenny said the program was well set out because of the way she could see her research progress and ensure she received feedback regardless of her location.

I honestly think that the whole setting out and formatting of the assignment was really good. I found it personally really beneficial. It just worked for well for me. It was really good because it meant you didn’t have to carry books and stuff to and from home and also, if you felt like it, if you wanted to the work between classes, then you could do it and the teacher could give us the feedback. Then you can do more and you don’t have to wait for a couple of days or so to get the feedback and you will be able to do some further work on it.

Jenny expressed pleasure in working in a computer-mediated social constructivist environment. It suited her well and perhaps her performance was indicative of her adaptation to the environment.

4.4 Diane

4.4.1 Student’s sequence of learning

Diane chose a research question focused on the marketing of fast foods and what companies use in the way of advertising to target children and parents. The question also required Diane to investigate a school that was promoting healthy eating. She then had to critically analyse the school's program and evaluate its effectiveness in addressing health related issues.

Diane made four assignment entries into the CMSCE program. Her first assignment entry came after the second lesson in which she described the level of consumption of fast foods in the Australian diet. An extract of Diane’s entry shows that her information
was not based on any research, but was developed from her personal perspective. She explained to the teacher that she acquired this information from her own experience and knowledge. She wrote:

The rise of fast foods in society can relate to people with no time or money. It seems to be a cheaper way to get out of cooking and a cheaper way of buying food. The impact of children wanting to have fast foods has been proven. The toys seem to catch the children’s eyes while being advertised where children can see. Having toys with their meals is an incredible strategy for a better result for the fast food companies. It enhances the appeal of the meal… These days, children have more power than the adults of making their own decision of buying fast foods. They also can make their parents have guilt of not buying what they want and so they give up and buy the food.

The absence of supporting research hindered Diane’s ability to provide any support to her assertions. In a verbal discussion, the teacher suggested to Diane that some research might help her to develop her understanding of the topic. Diane then asked, “Where am I going to find this information?” In a written communication entry on the CMSCE program, the teacher suggested books and the Internet, and provided some relevant web sites to assist Diane.

Diane’s subsequent assignment entry included research on the marketing of fast foods to children. Diane had focused on the marketing of confectionary, and wrote:

Fast foods play a big role in obesity…PhD Kelly Brownell says that it isn’t the people’s lack of self-control, it's toxic food environment…The lollies at the counter of Woollies or any other grocery store… the eye catching height for little children that would have the power to convince their parents into buying the product….It's important for us to look at this from a public health point-of-view, where we're not so concerned with how overweight an individual is, but how overweight the population is.
However, Diane’s entry lacked an analytical component. The teacher wrote to Diane and suggested she should provide more than just statements and that she needed to examine why marketing companies target young children. The teacher also suggested that the most important part of answering the question is to provide reasons and then examples to support the arguments.

The teacher broke down the question into sub-questions to assist Diane’s progress. For example, the teacher suggested that she start by finding out about the marketing of fast food. The teacher wrote the following extract on the CMSCE program:

…research a marketing company and find out who do they target. Why they target particular individuals? After completing these questions, examine health reports that might indicate whether rise in fast foods are contributing to poor health.

In her final two assignment entries, Diane displayed a more analytical approach to her topic. She examined a psychologist’s report on how companies were targeting children in order to get them ‘addicted’ to fast foods at a younger age. She was able to draw out information from the psychologist’s report and relate the reports’ findings to the eating problems faced by children.

After ensuing discussions with the teacher, Diane was asked make suggestions for how the government could rectify the situation. After some research, Diane came across a Canadian government initiative which targeted schools. She wrote:

The dieticians of Canada have approached healthy eating habits in schools. The government recommends replacing the current contents in vending machines with 100% fruit juices, low fat milk, non-fat milk and water. They also suggest selling fruit at the canteens rather than chips and chocolates. …The McGuinty government is making schools healthier places for students to learn by directing school boards to remove all junk food from vending machines in elementary schools, Education Minister
Gerard Kennedy said today.

One third of a child eating intake is at school. Canada’s dietitian are pleased to have the opportunity to influence the children’s eating habits at school and have some kind of control to their healthy choices.

The Australian government should target schools. The McGuinty plan makes sense and if children can develop healthy eating habits early, then it might be helpful later in life.

This response, written towards the end of Task 2, illustrates that Diane produced an analytical response based on research. Diane showed learning progress throughout Task 2.

**4.4.2 Diane’s task related communication**

This section describes Diane’s communication to the teacher and her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.4 presents the number of Diane’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.

<table>
<thead>
<tr>
<th></th>
<th>Written (Total 4)</th>
<th>Oral (Total 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
Diane’s communication during Task 2 had a total of 26 spoken phrases and 4 written phrases. The spoken phrases consisted of 13 comments, 8 question and 5 discussion phrases. Her discussion exchanges became more frequent towards the end of Task 2.

Diane’s written communications identified as questions in table 4.4, occurred after her third entry in which she asked the teacher for clarification of her work. Her discussion through written communication also occurred late in Task 2 and was entered while Diane was at home. It was not until towards the end of the task that Diane engaged in verbal discussions and questions with the teacher, which assisted her in answering the question.

Most of Diane’s communication were oral ‘comments’ and were usually responses in discussions with the teacher (9 phrases). However, she did make four comments with peers when discussing her topic. For example, a discussion with Mary and Hillary focused on eating disorders. Mary asked Hillary if she was investigating all eating disorders including obesity. Hillary replied, “…I need to look up all eating disorders, but I will start with anorexia.”. Diane’s responded with the following comment, “These girls with eating disorders are so pretty.”. Diane’s comments did not lead into further discussion or create constructive thought about the topic. This was typical of the comments Diane made in Task 2.

4.4.3 Evidence of socially constructed episodes and development of in-depth knowledge

Diane was eager to involve herself in class discussion, but did not use the information discussed in her early assignment entries. In her later assignment entries, Diane’s with the teacher, conversations related to her topic became more frequent and included the information that resulted from the discussions in subsequent assignment entries. The following example was also referred to earlier in Diane’s sequence of learning (page 19); the teacher said to Diane, “I have read your work and everything is based on your perspective. That is ok, but you need to back it up by actual facts. What do the experts say?” Diane replied, “Where am I going to find this information?” The teacher provided some advice, “Examine this website and use the information to help you understand the topic and then critically analyse the question based on your research.” The teacher then
wrote to Diane on the CMSCE program and provided an example, “…this website shows advertisements that use celebrities to incite children’s interest. Review the psychologist suggestions on this website because it will help you understand fast food companies marketing strategies.” Diane’s following entry provided more factual information which supported her opinion, for example:

Eric Schlosser says, “Fast foods and soda have moved into schools. The major companies have found a way to get the brands into the children's nature. Schlosser says “these kids have the taste for the food, it's a lifelong taste.”

PhD, Kelly Brownell also says that it isn’t people's lack of self-control, it's a toxic food environment. This all leads to an increase in obesity.

It was evident that Diane used the teacher’s feedback to assist in developing a more in-depth response. Her proclivity to discuss her topic increased as Task 2 progressed.

Diane’s responses to the question resulting from discussion with the teacher demonstrate level 3 ability (Chan et al., 1992). In her first assignment entry, she provided responses to her research question, but did not clearly indicate that she understood the content. Chan and colleagues (1992), suggest that information presented at this level shows little understanding. These entries were a form of retelling of information which showed some knowledge. This is typical of level 2 form of social constructivism. However, in her last entry, Diane was able to use personal knowledge together with her research and include it in the text. She was able to draw inferences from her discussions with the teacher and deliver a more informed response, typical of level 3 social constructivism (Chan et. al., 1992). For example, Diane researched Canada’s initiatives to reduce obesity. She examined a government proposal and analysed how the Australian government could use some of Canada’s initiatives. Diane wrote:

Australia should follow the Canadians proposal, but especially their goals of educating children. Getting into the habit of eating healthy at a young
stage is important. Children will have more knowledge of making the right decisions on their own. Dieticians of Canada have made guidelines to all schools. Healthy foods and promoting good nutrition plays an important role in a child's life.

Diane’s understanding came from discussions with the teacher. The above extract was the result of personal research, and guidance and feedback from the teacher.

Salomon and colleagues (1989) suggests that, in certain cases, without guidance from the teacher the understanding of the content may not be achieved because cognitive processes may not be used. In Diane’s case, this partnership with the teacher encouraged analytical thought which enabled a more in-depth response.

The above extract was preceded by discussions with the teacher. In this final entry, Diane showed a good understanding of the content and also related some of the information into real world contexts. For example, Diane explained, “I was analysing a speech that a Canadian politician made when addressing the eating disorders especially obesity in schools. I think that his efforts could help in all countries. He targets schools.” In this extract, Diane shows that she has identified commonalities in obesity problems across all of the countries; that is, the targeting of young children. Diane suggested that by targeting schools the problem with eating disorders in all countries may improve.

4.4.4 Student’s reflection on the learning process
Diane enjoyed the frequent interaction with the teacher. She explained that it enabled her to stay on track and even motivated her when she was expecting a response from the teacher. She said:

I was actually looking forward to that [feedback]. I was looking forward to seeing how I was going….I felt like I was doing something wrong so I’m like, oh I’d better check and then fix it or ask a question
She also appreciated the interaction with her peers. The discussions about work encouraged students to assist each other, especially when one student was researching information that supported another’s work. Diane explained:

Mandy helped me. She found some information for me, just out of the blue in a book or something and then she wrote it down and sent it to me.

Diane also suggested that she would like to learn in the same way in the future as it helped with her understanding and progress of her work, as well as motivated her to do the work. She said, “I got one whole page done on a Sunday because I just felt like doing it.”

Diane did have some suggestions to improve the usability of the website. She suggested that the URL address should not be a number because it was too hard to remember. She also thought that a format, similar to Word for windows would be more user friendly, especially features such as ‘spell check’.

Diane believed that the learning process was beneficial and motivational for her. It was evident from a teacher’s perspective that it took some time for her to adapt to the social constructivist method, but that her knowledge and understanding evolved as was evident in her last piece of writing.

4.5 Amy

4.5.1 Student’s sequence of learning
Amy’s chose a question designed by the teacher. The question asked the student to critically examine the effects of obesity on the Australian society and determine how the Australian government is attempting to prevent an obesity epidemic. The question also asked the student to examine influences that might lead an individual to become obese.

Amy made a total of five assignment entries. Her first assignment entry was relatively brief compared with her other submissions. She outlined types of physical activity that
were recommended by the government in an attempt to reduce obesity in the Australian population. A discussion with the teacher following this entry influenced a change in focus. Amy asked the teacher, “Does the government support people with obesity on Medicare?” The teacher asked Amy to find out. He wrote a question on the CMSCE program to Amy:

Medicare is a complicated issue. It should support everyone. The mission for Medicare contains the notion of simplicity, equity and universality. Research Medicare and determine if people with obesity are supported by this health care system.

In her second assignment entry Amy showed that she was able to take two sources of information and draw out relevant details to produce a comprehensive answer. Her first source of information was extracted from a government website detailing health concerns in Australia. The second source was the Medicare website which she drew on to describe how Medicare could be used to respond to the problem of obesity. She wrote:

The Australian Government has considered the Medical concerns, for a healthy and active community which addresses the issues of obesity and the Australian over weight community. The Australian Health Care Agreements has recently committed obesity as a life threatening disease, excluding its existence from the elective surgery list which allows Medicare to address and assist in the payments for services and clinics.

Also in this entry, she also explained the purpose of Medicare and how it is funded. She analysed and justified the inclusion of obesity in the health system. Her writing was lucid and analytical. An example of this is shown in the following extract:

Medicare is a system of health insurance which is accessible to all Australians. Medicare is designed as a universal system of Health Insurance which is equitable for all, simple to use and accessible to all. The aims of Medicare is to make health care affordable for all Australians,
to give all Australians access to health care services with priority according to clinical need and to provide high quality care….This is why obese cases, if life threatening, can be assisted with Medicare health insurance.

Her research created opportunities for further oral discussions with the teacher. Amy asked the teacher more about Medicare, about what it covers and who manages health care. The teacher explained that research into the health care system would help her to find out about Medicare and could also reveal some information about private health insurance. In her third assignment entry, it was evident that her research, together with discussions with the teacher enabled her to draw the conclusion that Medicare is a beneficial system for the Australian public. She wrote:

Medicare and the Pharmaceutical Benefits Scheme cover all Australians and subsidise their payments for private medical services and for a high proportion of prescription medicines. Under Medicare, the Australian and State governments also jointly fund public hospital services so they are provided free of charge to people who choose to be treated as public patients.

The discussions with the teacher had helped to further Amy’s knowledge about Medicare and the government’s health plan.

The teacher wrote to Amy on the CMSCE program and acknowledged the information written on Medicare and the benefits to the individual, but suggested that Medicare might create a heavy burden on the Government's health care system. This led to another research question for Amy. The teacher’s written question asked her to explain how the government and the private health funds have tried to encourage people to purchase private health insurance. Amy, in her fourth assignment entry, wrote:

In a medical release in March on the 11th of March 2003 there was the discussion on Medical Finance on the Australian Medicare conditions. This release discusses the controversial crisis of Medicare and Bulk
Billing. The Royal Australasian College of Physicians and the Australian Consumers' Association have called for urgent measures to maintain Australia's universal health care system, Medicare. "International evidence supports universal health care," Dr Robin Mortimer, President, RACP said. "Those countries with universal access to health care have better health outcomes than those that do not...."Medicare must not become only a safety net for the "poor" with the more "well-off" being "encouraged" to use the private health system," said Dr Mortimer. "That would see the destruction of our equitable health system.

Amy, in her final two assignment entries, continued to explain how the government had attempted to ease the burden on the public health system. She detailed the introduction of the ‘medical levy surcharge’, ‘lifetime cover scheme’ and ‘private health insurance rebate’ all of which were introduced by the government. Amy suggested that while Medicare is important, the importance of selling private health insurance to individuals who can afford it will benefit the individual and community in the long term.

4.5.2 Amy’s task related communication
This section describes the communication from Amy to the teacher and her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.5 presents the number of Amy’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.

<table>
<thead>
<tr>
<th>Table 4.5 Amy’s communication to the teacher and peers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written (Total 0)</td>
</tr>
<tr>
<td>Teacher</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Discussion</td>
</tr>
<tr>
<td>Question</td>
</tr>
<tr>
<td>Facilitation</td>
</tr>
<tr>
<td>Comment</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
Amy used a total of 33 phrases whilst communicating orally. Of these phrases, 10 of were questions, 9 were discussion phrases, 9 were comments, and 5 were comments.

Amy used oral discussion and questions as her main forms of communication. All of those questions were asked of the teacher. The majority of her questions were enquiries that arose from task related discussions. For example, the teacher and Amy were discussing Australia’s health care system when Amy asked, “Don’t all countries have Medicare?” The teacher replied “No. Some countries choose to have all health funds privately supported.” The teacher then explained that the Australian government was trying to increase the number of people with health insurance. Amy asked “why and how?” and the teacher asked her to investigate the policies governing public and private health insurance in Australia. This exchange was typical of Amy’s questions, which often resulted from or led to oral discussions about her current or impending research.

Most of her discussions were also with the teacher suggesting that Amy chose not to have task related conversations with her peers. Amy worked predominantly without interaction with others. She only engaged in conversation when it assisted in advancing her own knowledge or confirming her research findings. Amy did not use written communication throughout the task.

4.5.3 Evidence of socially construct episodes and development of in-depth knowledge

Amy contributed little in the way of discussions with her peers. Most of her verbal interactions were with the teacher. She engaged in some in-depth discussions with the teacher when she needed to confirm ideas, or clarify thoughts. These discussions often provided a catalyst for other avenues of research. For example, Amy explained to the teacher about her research into how the government was helping reduce obesity and that had led her to research how this was occurring through Medicare. Then she examined Medicare and learned how it is equitable, universal and simple and available for all Australians. The teacher asked what Medicare could do for a person and Amy explained that it provided basic medical expenses, emergency expenses and access to general practitioners. All Australians have access to Medicare and have a right to have medical help. The teacher then asked, “Why would a person take out private health insurance?”.
From this exchange, Amy researched the benefits of private health insurance which she included in her final assignment entry.

Whilst Amy showed a high inclination to talk about her topic with the teacher, she showed a reluctance to do the same with peers. Even in group discussions, Amy contributed and asked little. Her discussions with the teacher proved valuable in her acquisition of information and Amy would ask the teacher questions confirming knowledge and exchange information based on her topic.

Amy conducted a lot of individual research. An example of her research, as a result of social interaction with the teacher is shown below:

Medicare has had a major impact on health care delivery in two critical ways; first it has been a major factor in providing equity of access. Second, it has been very economically efficient regardless of what Medicare’s critics and the Federal Government suggest. Australia spends nowhere near as much on health as the US but has much better health outcomes. Medicare has provided Australians with high quality health care services with very good health outcomes.

Prior to writing this extract, Amy asked the teacher if Medicare was worth the money. The teacher suggested that it depended on the goals of the government. He explained that the United States does not have a public health system and expects its citizens to purchase private health insurance. The private health companies in the United States make a lot of money. Amy’s response is an example of how a social interaction created the stimulus for further thought and insight into an idea.

Amy’s answers were thorough and complete, but did not propose alternative solutions or synthesise the solutions into real world problems. According to Chan and colleagues (1992), Amy exhibited Level 4 ability when constructing information. That is, she was able to refer to personal knowledge to explain or interpret new text information, but was unable to construct inferences and develop alternate solutions not shown in the text (which would be typical of Level 5).
Amy answered her questions well and produced comprehensive answers, and despite her limited interaction with her peers, she engaged in knowledgeable, task related discussions with the teacher and developed a good insight into Medicare and the government’s role in health care. However, the limited discussion with fellow students may have limited her ability to think about and develop knowledge which would have enhanced her social construction of knowledge to a Level 5 standard.

It is evident in Amy’s sequence of learning that she only engaged in discussions with the teacher. It is also clear that without the teacher’s guidance, Amy may not have improved her understanding in relation to her topic. However, together with the teacher, she was able to answer specific questions about Medicare and private health insurance. For example, Amy explained her research to the class,

“I am finding out how the government is helping reduce obesity and that led me towards how the government is helping through Medicare. Then I examined Medicare and looked at how it is equitable, universal and simple and available for all Australians. It is funded by a tax levy that all Australians pay. Those who earn more than 50,000 dollars and don’t have private insurance, pay extra… it provides basic medical expenses, emergency expenses and access to the general practitioner. All Australia have it and have a right to have medical help.”

The teacher asked, “Sounds great. Why would a person take out private health insurance?” Amy answered, “The government wants people to take private health insurance because it is a heavy burden on the Australian government.” Mandy asked, “How much is private health insurance?” Amy showed her extensive knowledge of the topic, “It depends on what cover.” The teacher asked, “What does it cover?” Amy replied, “Ancillary benefits, choice of doctor, hospital, etc.” Mandy said, “It sounds worth having.” Amy showed reflective thought and answered, “But the problem is not everyone uses it. I’m still examining private health insurance, but those who benefit are sports people, pregnant people, and people like that.”
The quality of this exchange showed that Amy knew her topic with a great deal of depth which was a result of teacher student interaction.

4.5.4 Student’s reflection on the learning process

Amy was absent from the group interview and did not share her thoughts on the program formally.

4.6 Lisa

4.6.1 Student’s sequence of learning

Lisa chose a question to research which was created by the teacher. It required her to explore the role of physical activity in the development of physical, social and emotional outcomes. She was asked to examine the dimensions of health and draw conclusions about the factors influencing participation in physical activity.

Lisa made a total of five assignment entries. Her first assignment entry focused on physical activity and the benefits of physical activity. She also explained the guidelines recommended by the Australia government.

A discussion with the teacher about other government initiatives influenced the second assignment entry. Lisa examined a program called, ‘Active School Curriculum’:

Another government initiative is the Active School Curriculum, this initiative is covered in the schools funding legislation for 2005-2008 and this legislation states that "each state and territory and non-government education authority will be required to include in their curriculum at least two hours of physical activity each school week for primary and junior secondary school children."

In her third assignment entry, Lisa explained a few government initiatives such as ‘Active Australia’ and concluded that influencing children and families directly (through legislations) would be more beneficial to the nation’s health than advertisements and media.
Another oral discussion with the teacher ensued. The teacher asked Lisa if physical fitness was the only benefit of physical activity and Lisa decided to explore this question further. Lisa’s next two assignment entries showed her subsequent research. Lisa found that participating in physical fitness promoted health in a variety of ways, especially when adopting a holistic view. She explained the social and emotional benefits of physical activity, but also identified some possible problems in participating in sport such as over exercising and training with injury. She discussed this with the teacher and asked if she could examine the dangers of physical activity.

After looking at current athletes playing with injuries, Lisa asked if she could conduct an empirical study on an elite athlete she knew. An extract from her fourth assignment entry shows some findings from her empirical research:

Jenny trains 6 times a week for a total of 27.5 hours a week. This level of competition requires dedication and a determination to succeed, though this determination to succeed may come at a cost. Through injuries and hours of physiotherapy a week Jenny continues. To determine the effects that competition has had on her we shall examine all 5 dimensions of health…Jenny like all other gymnasts experience many emotions while competing in competition, training and even in their outside lives. Stress derives from the desire to win, complete the routine, look good and also satisfy their hunger for success while making others in their lives proud of them- whether it is families, coaches or the judges.

Lisa used previous knowledge about holistic health resulting from physical activity to determine if the person she was interviewing was ‘healthy’.

For her fourth and fifth assignment entry, Lisa transcribed some of her interview with Jenny (a fellow student and an elite gymnast). From her discussions with her peer, Lisa was able to demonstrate a sound understanding of her topic and was able to synthesise her knowledge extracted from research and draw in-depth conclusions.
4.6.2 Lisa’s task related communication

This section describes the communication from Lisa to her teacher and her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.6 presents the number of Lisa’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.

Table 4.6 Lisa’s communication to teacher and peers

<table>
<thead>
<tr>
<th></th>
<th>Written (Total 6)</th>
<th>Oral (Total 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

Lisa engaged in a total of 47 phrases of oral communication. Of these, 16 were questioning phrases, 11 were discussion phrases, 11 were comments, and 9 were facilitation phrases. She also used a total of 6 written phrases to communicate with the teacher and her peers. Of these, 2 were discussion phrases, 2 were questions, and 2 were facilitation phrases.

Lisa frequently engaged in all types of interaction. Six of Lisa’s questions to her peers were questions about Jenny’s training. She used Jenny as a subject in her research and the oral questions recorded on audiotape were extensions to an interview conducted in the student’s own time outside of class time. Lisa wanted to know the reasons why athletes train through severe injuries and received some first-hand information from Jenny. An example of an extension question that Lisa asked Jenny was, “...you believed to you needed to attend every training session whether you were sick or injured to make the team, you said that it was more important than your own health sometimes...was training ever more important than your friends or family?”.
Whilst oral questioning was the most used form of communication by Lisa, she also participated in facilitation both orally and in the written form. The advantages of this form of communication became evident when all students presented their information and Lisa was an avid contributor to several other discussions. Lisa offered sources of information to her peers that she had come across in her research. She assisted Sara with information on physical activity by providing the “Active Australia” website, and she also provided a website on social drugs for Ann. Lisa also engaged in written communication late in the task for more detailed and involved questions. This enabled her to get more time with the teacher and get a more involved response which filtered into oral discussion in the classroom.

4.6.3 Evidence of socially construct episodes and development of in-depth knowledge
Lisa showed a high proclivity to discuss her and other’s research throughout Task 2. She had the ability to use the information resulting from these discussions as guidance to develop her own research and to present ideas. For example, the teacher commented that Lisa, in her research, not only focused on the holistic benefits of health, but also highlighted the dangers of over-exercising. The teacher asked Lisa to find some case studies to support her ideas. Lisa asked if she could interview Jenny (a peer and an elite athlete) to find out first hand. She also suggested that she should not only examine Jenny from a physical viewpoint, but from a holistic viewpoint. This shows that she was eager to discuss her topic with her peers in the search for answers to her research question.

As a result of her discussion with Jenny, Lisa suggested that desire and passion drives the athlete beyond the barrier of pain and their focus on victory is steadfast. Lisa was able extrapolate information from discussions and her research. From this she constructed inferences and developed convincing theories to answer her research questions. According to Chan et al (1992), Lisa exhibited Level 5 ability when socially constructing knowledge. She was able to reach this level assisted by interactions with the teacher and other students throughout Task 2. Her tendency to social construct knowledge through discussions produced extensive and in-depth answers. She utilized her newly acquired knowledge in her answers both verbally and in written form.
The teacher asked Lisa to research articles in which exercise can improve social health, or damage social health. Lisa wrote:

Another initiative by the Australian Government is the Healthy School Campaign, this campaign recognises that good nutrition not only contributes to good health but also good academic achievement. This campaign/initiative aims to help provide the skills and knowledge to both children and their parents on how to develop healthy eating habits. Schools that are successful with the application for a grant will have access to money to help build on existing projects.

Her own research and her analysis of other research, was guided by the teacher, and consequently assisted her responses. She also demonstrated an ability to develop understanding as a result of discussions with her peers. A conversation with Jenny assisted in searching for better solutions. The collaborative process provided a forum for constructive learning and the generation of thought, which was evident in her analysis of Jenny and how physical activity can cause harm.

Further, she was able to apply this knowledge in later tasks and create a more comprehensive answer. These interactions with Jenny in turn prompted Lisa to reconceptualise her ideas, apply the resulting information to a new situation, relate new material to known material, provide justifications, and ultimately draw conclusions (Cobb, 1994 and King, 1989, 1990, 1992). She showed this when examining why athletes play with pain. Lisa suggests:

Sometimes they [athlete] play through pain and end up doing irreparable damage to their body. Some athletes take drugs to compete, despite the consequences of getting caught and the physical danger of taking the drug. Sporting heroes are expected to be the strongest, the fastest, and the best. The spectators expect it of them and they expect it of themselves…Elite athletes push themselves, it’s like an addiction, an adrenaline rush that comes from them pushing themselves to be the best. Elite Athletes strive
for success, it’s like a persistent hunger, no matter how serious the injury the foremost thing in that athletes mind is recovery and how long till they can compete again. ... They are only concerned about the present and do not worry about how their bodies will be affected in the future, the life after sport….The reason why athletes go back is neither a physical reason or medical, it is a simple case of emotion. It is the will to challenge themselves, it’s an ego issue. They want to push themselves to the limit so they do not die wondering what if? Many athletes both amateur and elite push themselves and injure themselves either temporarily or permanently, not only physically but also in the other 5 dimensions of health.

Lisa, through her research, found a commonality in her readings. She suggested that athletes are exceptional because of their drive to succeed, but this drive can also cause them permanent injury because they play through pain. This analytical process is evident throughout Lisa’s work.

Lisa is able to discuss topics of interest with her peers and teachers who are more expert in a particular field, and develop a greater understanding of the content area. Evidence of this was highlighted when Lisa learned of Jenny’s pain and stress while she competed as an elite athlete. Consequently, Lisa could identify similarities between Jenny and other athletes and draw conclusions about the possible reasons for this particular behaviour. Lisa demonstrated her understanding of the content by assimilating the knowledge and information from a variety of sources and then drawing conclusion or posing other questions as a result.

4.6.4 Student’s reflection on the learning process

Lisa believed that the interaction with the teacher ensured that she understood information as she researched it. She suggested that this was a better method than amending information at the end an assignment or task, stating:

It just made us understand it more because like if we researched it and didn’t fully understand it then he went through it with us till we understood it as well.
She also highlighted the convenience of the process:

Doing it through a website it made it easier than carting discs and CDs and email backwards and forwards, because we could just access the website. It was a normal internet website and we just logged in and we could continue with what we were doing instead of having to remember to email and save it at home and then transfer it... I did it at home like during the ads of the TV shows. I just had dad’s laptop ... and I just thought oh well I may as well work on PD like, I’ve got nothing better to do and then once I got into it I actually abandoned the TV show ... if you were away sick you could just like log in and do it, because I was away sick on and off for two weeks and like I just sat at home doing the work.

Lisa suggested the peer interaction assisted her in developing a greater knowledge of information and also consolidated understanding of an individual’s own work through explanation. It helped with research and she suggested that there was value in sharing ideas:

He [the teacher] got us all together every now and again to discuss each other’s topics. .... by getting us together we were understanding each other’s assignments but we were also getting inputs from each other ... It just gave us like another way of looking at things by talking to each other, and the fact that we were allowed to talk to each other about all the work and anything else kept us more on task because normally you’ve got a teacher sitting there going shut up and work basically ... a few of the topics overlap, like I was doing physical activity and I think it was Mandy and Diane were too. You guys were doing obesity and some of their information related to mine so we kind of swapped and shared. ... and Ann was doing drugs ... I had the text book and was flicking through it on the train one day I got bored and I found some stuff on drugs so I gave it to her.
Lisa felt more motivated to do the work because of the freedom to interact. The interviewer asked the group if it was an effective way of learning. Lisa replied:

No doubt everybody else felt like, I didn’t dread coming to class.

She also mentioned the depth of knowledge she developed through the learning process and went on to tell the interviewer about a section of her research. The interviewer also asked the group if they discovered new and interesting information, to which Lisa replied:

I know in mine. I found out about the government initiatives relating to physical activity and how they’re trying to approach it now, aiming the initiatives in particular at school-age children, like the Active Australia one. You basically get primary school kids active two or so times during the week and it doesn’t cost anything and they provide a free afternoon tea that’s healthy, like fruit and water and you get them active for an hour and a half.

Despite the positives of the learning process, Lisa did highlight some things she felt could improve with the program itself. For example, she said:

The only problem with it was the formatting of the website and basically you couldn’t do the stuff you could do in Word.

Lisa found the process educational and found social constructivism a motivational environment. In summary, she felt that a few technical problems tainted an otherwise a highly beneficial learning environment.

4.7 Mandy

4.7.1 Student’s sequence of learning
Mandy negotiated her question with the teacher, which focused on obesity and what Australia is doing about it. Mandy made a total of five lengthy assignment entries. Her
first assignment entry discussed the power of advertising and the targeting of young children by fast food companies. At the end of her first assignment entry, Mandy made some concluding statements about the rise of obesity. She wrote:

With the rapid rise in obesity throughout the world, we can no longer sit back and assume that no action will prevent weight problems. If we continue to eat so much and choose so many foods of poor nutritional value while minimising physical activity, the problem will continue to grow. Since overweight children have a high chance of becoming overweight adults, preventing obesity in children should be a high priority for governments, health professionals, families and schools.

Her first entry prompted the teacher to write an extension of the initial questions on the CMSCE program, asking Mandy to examine another country’s strategy to reduce obesity and then, based on her research, Mandy should design a possible initiative that Australia might use.

Mandy’s second and third assignment entries examined Canada’s initiatives in reducing obesity. She explained that the Canadian Population Health Initiative (CPHI), launched an initiative in 1999 to tackle the problem of obesity, began with a round table conference which was intended to promote the development of cross-sectoral linkages among groups to address the problem of obesity. Mandy explained that, as a result, the CPHI created key priority areas for action and formulated a plan to address each priority area. Mandy’s entry provided a detailed explanation of these steps. In discussions with the teacher, she suggested that Canada, with its roundtable procedure, used a social constructive method to determine solutions for managing obesity.

In her fourth assignment entry, Mandy examined the United Kingdom’s response and found that it was more directive than socially constructive, but was effective in the way that it addressed social determinants and the responsibility of the community to address the problem. She wrote:

Experts agree that the causes of the obesity epidemic are environmental,
related to living in surroundings that allow easy access to food and little need for exercise. Unlike policies in the United States, which promote individual rather than state responsibility for the obesity problem, the strategy in the United Kingdom specifically states that the solution does not lie with the individual or doctor’s office. The United Kingdom report recommends measures including the simpler labelling of food with red, yellow, and green symbols (categorising healthfulness) and banning vending machines and school sponsorships by companies associated with unhealthy foods, and better access to programmers to treat obesity.

Mandy found that, whilst there was not much short term difference between the policies in the reduction of obesity, there was a lot more support for the Canadian policy by all sections of the community. Mandy concluded that both the Canadian and the United Kingdom approaches had many positives and Australia could adopt many of the strategies to address its own obesity epidemic.

Mandy asked the teacher if she should address the final part of her task, which involved the design of a possible initiative that Australia might use to manage obesity, by looking at its current policy. The teacher agreed with this method and proceeded to assist Mandy in her exploration of the Australian strategy.

In her final assignment entry, Mandy found that the Australian government’s strategy was not dissimilar to the Canadian’s or the United Kingdom’s. She found that solutions were based on meetings with concerned groups. These groups suggested that an examination of evidence on obesity in relation to the community needed to be conducted. They also believed that health needed to be identified as a priority area for action and research. Mandy explained that some experts on the development of health strategies, however, cautioned against accepting causal information that may not be validated by the evidence; that is, information from parents and other individuals who base their reasoning on personal experience. Mandy noted that as a result, an advisory group was established to work with policy makers and researchers.
However, Mandy suggested that the addressing of social determinants, such as the environment or socio-economic circumstance that affect a person eating pattern, still needed to be addressed in Australia’s policy development.

4.7.2 Mandy’s task related communication

This section describes the communication from Mandy to the teacher and to her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.7 presents the number of Mandy’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.

Table 4.7 Mandy’s communication to the teacher and peers.

<table>
<thead>
<tr>
<th>Written (Total 5)</th>
<th>Oral (Total 46)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
</tr>
<tr>
<td>Discussion</td>
<td>2</td>
</tr>
<tr>
<td>Question</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
</tr>
</tbody>
</table>

Mandy communicated with the teacher and her peers a total of 46 times during Task 2. Of these, 20 phrases were discussion, 10 were comments, 9 were questions, and 7 were facilitation phrases. She also made a total of 5 written communicative phrases. 3 were discussion, 1 was facilitation and 1 was a comment.

Mandy engaged in frequent oral discussions with the teacher and her peers. Much of her discussion focused on her peer’s topics, and many suggestions made by Mandy were listened to by other students, hence the relatively high proportion of facilitation compared with other students. Her written communication was not as frequent. In Mandy’s case, it appears that she found the immediate two-way nature of the oral communication more advantageous and she limited her written communication after the first few lessons.
4.7.3 Evidence of socially constructed episodes and development of in-depth knowledge

Mandy’s proclivity to find answers to her research question and understand her topic was evident in her frequent oral discussions with the teacher and her peers. Her interest in a variety of topics and her eagerness to share her views made her a versatile person to discuss many topics with, throughout this task. Mandy often used her discussions to assist in her learning and assist others. For example, Amy was talking to Mandy about her question on obesity and why obese people are unable to seek help. Mandy suggested that people might not be able to afford it and the conversation continued. Amy said, “The government suggests that people that are disadvantaged economically, socially or through their location are subject to obesity. The marginalised population is suffering from obesity and the government has included the minority groups in a forum to reduce the risk of obesity amongst the whole population. It also included cultural groups.” Mandy made a clarifying statement, “So, what they are trying to find out is, why each group marginalised suffers from obesity and then design a strategy. That’s like social construction of information.” Amy replied, “Yes. Find out what is pulling them down and rectify the situation.” Mandy asked another question, “Are they trying to find out why certain groups are more likely to be obese?” Amy then told Mandy that she had not found the answer to that question through her research yet.

Mandy often volunteered information, but was also open to receiving information and using it in her work. This approach appeared to suit Mandy’s learning style which was evident in the quality of her engagements and the quality of her work.

Her depth of knowledge and understanding of her own topic, as well as many others, was made more evident when the class presented their findings towards the end of the task. The contributions Mandy made during these presentations of her own work and of her peers, were frequent.

Mandy, according to Chan et al. (1992), showed a high level of social constructivism during Task 2 (see chapter 3, table 3.2). She was not only able to develop her research and make comparisons and refer knowledge to interpret new information, which correlates with Level 3 and 4 (Chan et al., 1992), but could extrapolate information and
create alternative solutions to existing problems (Level 5). This was evident in her written work, especially in her final assignment entry in which she proposes a solution to manage Australia’s obesity problem.

Her interaction with the teacher enabled her to ask strategic questions, which helped her to clarify understanding and gain further insight into a problem, and so to ultimately develop a deeper understanding of the content.

This was also true of her interaction with her peers. She used many sources, including other students, to develop her knowledge. Mandy used her research and discussions with the teacher and Jenny to develop an in-depth response and provide a possible solution to the obesity epidemic, relating it to the Ottawa Charter. Collaboration between Jenny and Mandy provided a forum for peer learning and this interaction allowed Mandy to engage in the process of generating ideas. Mandy wrote the following extract on the success of the Canadian Population Health Initiative (CPHI), as a result of a conversation with Jenny:

CPHI accomplishes its goals by generating new knowledge on the determinants of health, synthesizing evidence, developing policy options and reporting to the public. The policies developed were based on the framework of the Ottawa Charter and were socially constructed in a round table discussion.

According to Cobb (1994) and King (1989, 1990, 1992), peer questioning that leads to cognition is evidence of a social constructive process. Mandy showed skills in the social construction of knowledge by being able to assimilate knowledge and information from a variety of sources and then draw conclusion or pose other questions as a result. She wrote:

If Australia utilises some of the strategies that the other countries have produced we can reduce the percentage of obesity to a great extent…The United States suggested the media try and cut down the amount of unhealthy food ads shown at the peak time, when young children are
watching TV. This would be a great concept to reduce the obesity percentage in young Australia children as young children are being targeted in these ads.

Another strategy we can utilise to reduce obesity in youth would be the concept that the United Kingdom proposed. They tried a concept of introducing a policy were school canteens stop selling “junk food” and started selling more healthy eating options. Australia has introduced this into a few school canteens already. But this is something the community needs to do. We need to enforce school canteens to sell healthier eating options.

Synthesis of her knowledge shows that Mandy developed a good depth of knowledge for her topic. Continual discussion with teachers and peers helped refine and mould Mandy’s ideas about how to solve Australia’s obesity epidemic.

4.7.4 Student’s reflection on the learning process
Surprisingly, Mandy did not engage frequently in the group interview. She was mentioned several times as a peer who facilitated the learning process of others and as an individual who enjoyed engaging in conversation about research, but she made few comments in the group interview. She did say, however, that the frequent interaction, both orally and in the written form, helped to develop her understanding. Mandy states:

It helped understand that you can further your understanding by negotiating with other people.

Mandy’s interaction with her peers ensured that she created a greater depth of understanding of her own work and she helped some other students do the same. Her knowledge base increased through written and verbal engagements enabling her to be knowledgeable about a variety of topics.
4.8 Ann

4.8.1 Student’s sequence of learning
The question negotiated by Ann with the teacher focused on an emerging drug problem and the actions the government used to reduce harm to the public. Ann made five assignment entries to answer her question. Her first entry outlined all the groups of drugs including stimulants, depressants and hallucinogens and provided a general explanation of the affects each has on an individual.

The teacher offered a written suggestion through the CMSCE program; that Ann focus on one drug to ensure concentrated research and in-depth learning. Ann chose ecstasy as her drug to research. Her next assignment entry discussed ecstasy as a problem in society. She highlighted statistics that showed the trend of young people using and abusing the drug. Ann also explained the effects of the drug on the individual. She wrote:

Ecstasy is a rising problem within the community and is a very prominent drug in the rave circles and lifestyles. Ecstasy has both stimulant and hallucinogenic effects. The effects of ecstasy have been linked to exhaustion, over-heating and dehydration being the short term effects with extended use of the drug being linked to mood disorders and memory and attention deficits….Ecstasy is not an addictive substance but the side effects of the drug and the feeling that is left with the taker is enough for the person to want to use the drug regularly

The teacher gave Ann written feedback on the CMSCE program and posed a further question which asked Ann to research what the government was doing to manage this problem. In her third assignment entry Ann discussed various government attempts to reduce the harm from ecstasy:

The Australian federal government and the South Australian parliament have recently banned a harm reduction organization from testing the purity
of ecstasy at rave parties and threatened the group with arrest. The group attends these raves and sets up an area where rave goers can go and test the purity of the ecstasy pills. The group does not encourage the taking of the illicit drug but is there for the purpose of trying to reduce the risk of a substance leading to an overdose and death because of an impure substance.

To test for purity, an ecstasy testing kit is needed. In a standard kit a reagent (marquis reagent) is provided and this will determine the substances that are contained within the pill.

Ann discussed her topic in the classroom and it incited some debate. Throughout the debate, Ann continually presented both sides of the argument on several issues hoping to present the issue as she has researched it. In her next assignment entry she wrote:

People see the testing kits as encouraging the taking of ecstasy and strongly disapprove the matter and believe the operation should be shut down and banned. However, the testing doesn't encourage taking the ecstasy, rather knowing what substances the taker is allowing into their system. In many cases of organisations setting up at parties and raves, testimonies have been reported of ecstasy users abandoning and discarding their pills after finding out that the pill contains substances such as speed and ketamine only to name a few.

Her final assignment entry analysed other countries’ approach to drug issues (not always ecstasy specifically). Ann suggested that the moral dilemma makes it difficult to apply some solutions even though they show evidence of success. She also pointed out that some countries have different situations and so require different approaches.

4.8.2 Ann’s task related communication
This section describes the communication from Ann to the teacher and to her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.8 presents the number of Ann’s meaningful task related
phrases used in a variety of individual and group communication with teacher and peers.

Table 4.8 Ann’s communication to the teacher and peers

<table>
<thead>
<tr>
<th>Written (Total 5)</th>
<th>Oral (Total 43)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>2</td>
</tr>
<tr>
<td>Question</td>
<td>1</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3</td>
</tr>
</tbody>
</table>

Ann engaged in a total of 43 oral phrases; 21 of which were discussion, 14 of which were comments, 12 of which were questions, and 6 of which were facilitation phrases. She also communicated in writing a total of 5 times; 3 discussion, 1 question, and 1 facilitation phrase.

Many of Ann’s interactions were in the form of discussions, which helped her consolidate her research, or prompted further questions to investigate. It assisted her in her task and she developed an in-depth knowledge on her topic. For example, a conversation with the teacher about possible solutions to the ecstasy problem encouraged Ann to look into other country’s solutions. The following discussion exemplifies Ann’s ability to analyse her research and draw credible conclusions. The teacher asked Ann how her investigation was going. Ann replied, “…it is evident that the problem is the same, but different in every country. Moral issues hinder possible progress…the problem is that it’s a fine line between helping people and encouraging the use of drugs”.

Ann facilitated the learning of her peers in task-related conversation. She discussed alcohol with Jenny which prompted Ann to investigate government solutions. The following excerpt is a facilitation exchange between Ann and Jenny. Ann stated, “There is such a strong stereotype. Alcohol is the most abused drug and people don’t see it as a
drug”. Jenny replied, “The main abuses of alcohol are teenagers. I should look at the way the government is addressing the abuse of alcohol in relation to teenagers”. Ann suggested, “I think there was a government forum about upping the legal age to 21. Perhaps you could look at the problems that might be associated with that as well.”

Ann engaged in some written communication early in the task, but as the task became more specific, she did not find it necessary to collaborate with her partner and instead used oral communication with the teacher to construct a better knowledge base.

**4.8.3 Evidence of socially constructed episodes and development of in-depth knowledge**

Ann’s proclivity to discuss her topic with the teacher as well as her peers was relatively high. She engaged in frequent interaction with her classmates and her discussions induced morality debates as well as thoughtful reasoning (see sequence of learning for Ann). The majority of her social interaction came from discussions with the teacher. However, it was the incidental discussions with her peers that prompted her to find more information and produce arguments on her topic. For example, Ann talked to her classmates about her topic, teenagers abusing ecstasy:

They are taking more ecstasy tablets despite there being no addictive substances in the drug. Instead they are addicted to the euphoria. Because it is associated with Raves and the party scene, it is sold to teenagers and it has contaminants that cause teenagers problems. So organizations are setting up testing stations at parties where users can get their tablets tested. The way they do that, is to get a tupperware lid and scrap off some of the tablet. Add a reactant substance and you have a colour chart. For pure ecstasy it goes black. If it contains speed it turns orange, if it turns lime green its 2CS. Impure ecstasy may also contain codeine and other impurities that can kill you.

Mary then asked Ann why people die from ecstasy use. Ann replied, “They die from their environment. They drown themselves by drinking too much water and they dilute salt in the blood stream, they overheat, they exhaust themselves. It lasts for six hours
and it makes you forget all you problems, and then when you come off the high you get depressed and become suicidal.” Sara questioned the controversial solutions of the government and asked, “What countries have testing?” Ann replied, “The UK have the test and South Australia, but there is political debate on its merits that I am looking into.”

Ann’s understanding of the information allowed her to manage these debates and help others develop their knowledge through discussion.

In her assignment entries, Ann showed evidence of being able to paraphrase text, especially when describing parliamentary debates on ecstasy, and providing elaborative inferences to the transcription of the debates. She also showed a high level of problem solving because she was able to refer to previous research when attempting to understand or explain new information. This was evident when she explained the positive reasoning behind organisation’s desire to supply testing kits even though drugs were illegal. She said she could see that this would provide a safer way to take the drug. According to Chan et al (1992), Ann was able to socially construct information at Level 4 ability, but stops short of providing the alternative solutions to existing problems which would enable her to socially construct at a higher level (Level 5).

Ann’s discussions with the teacher enabled her to improve her understanding of the topic through the activation of mental operations that required guidance from a more knowledgeable partner. Evidence was shown when Ann was able to examine many points of view in relation to management of ecstasy. Her social interaction with the teacher and other students enabled her to construct a possible solution based on new knowledge. For example, Ann asked the teacher, “Am I on the right track with my analyses of ecstasy and the UK government’s efforts compared to Australia?” The teacher replied, “Your explanation is excellent. You will notice that I have said that there is a contradiction in the government approach in South Australia and their approach to the injecting rooms.” Ann agreed and continued, “Yes. I found a political debate saying that and I was going to include it in my work”. Ann showed that she has been contemplating the ecstasy issue by saying, “The problem is that it’s a fine line between helping people and encouraging the use of drugs.” The teacher volunteered
some information, “In the UK they have people who will test your drug to ensure it’s pure, similar to the kit in South Australia.” Ann confirmed the research, “I think I came across that in my reading about reducing the harm of ecstasy.”

This exchange shows the development of understanding between teacher and student. Ann was also able to use conversations with her peers to help enhance her understanding. According to Slavin (1996), she was able to discuss research. This in turn provided a forum for the development of ideas in proposing strategies to reduce the harm from ecstasy. For example, Ann learned from Jenny about the Australia's drug offensive strategy which was developed from the Ottawa Charter (see 4.3). Ann then subsequently related her topic to the Ottawa Charter and was convinced that perhaps the government's actions towards the ecstasy problems, was based on the Ottawa Charter.

### 4.8.4 Student’s reflection on the learning process

Ann believed the learning process created a greater depth of understanding for many reasons. Firstly, she felt the work researched needed to be restructured using her own words before being put on the page. This enabled her to make sense of her research before presenting it on the CMSCE program. Secondly, the questions from teacher and students meant that she had to understand her topic in order to answer them. Finally, information needed to be backed up by research to be valid. She suggests:

> It’s because you had to research a lot and then summarise it and then put it in your own words because you’re putting it back up onto the internet site and if you’ve been there claiming this, then you had to back it up. So a lot of it was information that you had to take in and then research further into that information and then put it into your own words. It sunk in.

During the study, Ann conducted most of her discussion around her research which enabled her to develop a better understanding of her content. She was active and an avid contributor of most discussion. However, she was relatively quiet during the group interview.
4.9 Hillary

4.9.1 Student’s sequence of learning

Hillary negotiated a question with the teacher which focused on eating disorders, particularly obesity, anorexia and bulimia. Hillary made a total of five assignment entries during Task 2.

Hillary’s first assignment entry explained each eating disorder and outlined the physical and mental problems associated with developing obesity, anorexia and bulimia. In her next assignment entry, Hillary further explained some of the physical side effects of anorexia and bulimia, such as arthritis, tissue generation and anaemia, which result from a lack of essential nutrients. In this entry, Hillary also researched a study that examined which individuals were more susceptible to developing anorexia and bulimia. She wrote:

Research suggests that eating disorders are related to homosexuality in men. However, links with female sexual orientation are not as apparent. With females, appearance seems to be the main cause of developing an eating disorder. Many studies have not consider the role of femininity, even though evidence suggests that this is a more critical factor than sexual preference. Because eating disorders such as anorexia are often caused by controlling factors, females may develop the disorder because of male domination in society and the need to control something.

After her second assignment entry, Hillary discussed the development of eating disorders in females with the teacher. Hillary is a gymnast and she suggested that her sport encourages eating disorders because of expectations that gymnasts be very slim. She asked the teacher if she could examine eating disorders in gymnastics and determine what causes them. In her third assignment entry she explained why female gymnasts might be more vulnerable to eating disorders:

The exact description of what today's female gymnast must accomplish to stay competitive at its highest levels is to have a thin, girlish figure. For
these athletes, the onset of womanhood is their biggest fear because it means developing hips or breasts that might hinder their performance. Thus, starving themselves offers the most convenient solution to their problem.

The second reason for gymnasts’ greater drive for thinness and body dissatisfaction is the subjectivity of their judging system. …each judge assigns a score according to his or her own beliefs. Thus, the appearance of the performer may actually influence their perceptions and affect their ultimate decision.

A third reason for the greater prevalence of eating disorders among these gymnasts is their authoritarian coaches. A large percentage of coaches are constantly instructing the girls on "how to count calories, how to act, what to wear, [and] what to say in public" ("Dying to win" 1994). As a result, the only aspect of their lives they can truly control is the food they put into their bodies.

Hillary’s research confirmed her suspicions; that is, female gymnasts are more susceptible to eating disorders. However, she explained to the teacher that she did not understand some of the reasons. Hillary said that the research gave her greater insights into her sport and eating disorders.

An article Hillary read suggested that eating disorders amongst gymnasts, were pathological rather than based on expectations of the sport. In her following assignment entry, she explored the possibility of this theory. She wrote:

It is unclear whether eating disorders observed in gymnasts is the result of a mental illness or if it represents a commitment to the achievement of athletic excellence. It has been argued that a pathological disease of any kind is "inconsistent with optimal athletic performance, and there is substantial evidence that athletes tend to have healthy psychological profiles" (O'connor et al. 1996).
Another study challenged this idea by finding a relationship between eating-disorder problems in gymnasts and personality. In this study, the bulimic subjects showed significantly higher levels of pathology than the “normals”.

Hillary found articles that supported both sides of the argument, but through her own experience believed that gymnasts were subject to eating disorders because of their situation. After a conversation with the teacher and Jenny (also a gymnast), Hillary wanted to research further about gymnasts and their susceptibility to eating disorders, and so explored more related studies to find out whether eating disorders might be a genetic problem. In her fourth assignment entry she wrote:

It is believed that there is a hormone in the human body that, depending on the level, will depend on the potentially risk of an eating disorders. …the NPY hormone may determine your subjectivity to eating disorders… if you have a high level of NPY then you will end up with the greater chance of obesity. Conversely, if you have a low level of NPY than the average person, you have a greater risk of developing anorexia and bulimia.

A further discussion with the teacher and Jenny centred on the advantage of being thin as a gymnast. Hillary said she had found an article that suggested that appearance has no bearing on the marks given to the gymnast. The article began by suggesting appearance is a significant determinant, but it argued that participants of all shapes win and lose. Hillary disagreed with the research. Jenny suggested that even warming up in front of the judges influences results and said that she believed most judges make up their mind before competition. Hillary agreed and believed warming up in front of the judges had a bearing on performances. Hillary concluded that several factors, including the environment and genetics, affect a person’s disposition to an eating disorder.

In her final assignment entry, Hillary examined body types and which would be more suited to gymnastics. She concluded that female gymnasts who had the meso-ectomorph
body type and were small in stature would not need to restrict their eating as much as other body types.

4.9.2 Hillary’s task related communication

This section describes the communication from Hillary to the teacher and her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.9 presents the number of Hillary’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.

Table 4.9 Hillary’s communication to the teacher and peers

<table>
<thead>
<tr>
<th></th>
<th>Written (Total 2)</th>
<th>Oral (Total 35)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Question</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Hillary communicated a total of 35 oral phrases throughout Task 2. Of these, 13 of these phrases were comments, 10 were discussions, 7 were questions, and 5 were facilitation phrases. She also communicated in writing a total of 2 phrases and both were discussion type phrases.

Hillary engaged in oral discussions with the teacher and her peers, especially after her third and fourth assignment entries. The discussion often raised other interesting ideas, which Hillary explored to satisfy her curiosity. Most of Hillary’s discussions occurred with the teacher and with Jenny who had a common background in sport.
4.9.3 Evidence of socially constructed episodes and development of in-depth learning

Hillary showed a high proclivity to discuss her topic with the teacher and Jenny, but did not often talk with other peers. Her interactions with Jenny proved worthwhile in developing ideas and promoting thought. Discussions provided fruitful information about the pressures on gymnasts to maintain a low weight. For example, Hillary suggested that, “gymnasts compete under pressure because they are afraid of falling behind and losing their spot on a team. That is why they diet and are anorexic.” Jenny concurred and said, “Yes, it happens all the time. The skinniest people competing get the most points.” The teacher asked, “Do you think it is on the mind of the judges when they judge?” Hillary replied, “It’s a stereotype, but I think the more attractive skinnier girls get extra points, so they are encouraging eating disorders.”

This exchange is typical of the knowledge that was shared in Hillary’s discussions and much of the information helped her with other research later in the task. Hillary also utilised information discussed with the teacher and this helped her develop her understanding of her topic.

According to Chan et al. (1992), Hillary showed an ability to use her own experiences together with researched material to provide a more detailed explanation of her topic than if she explained research material in isolation. She was also able to extract information and provide possible reasons to particular problems which suggest that Hillary could socially construct information at a level 5 ability.

This level of social construction stemmed from her proclivity to discuss a topic in which Hillary had a high level of expertise and interest. Hillary used her discussions with the teacher to help find answers to questions arising from discussions and fill gaps in her knowledge. According to Salomon, et. al. (1989) and King, (1991) the questions Hillary asked of the teacher enabled her to solve problems. Her questions were used to gain insights into her problem and ultimately develop a deeper understanding of the content.

Evidence of this occurred in the following exchange; Hillary said to the teacher, “All the gymnasts with eating disorders are artistic gymnasts. Some athletes go through so
much.” The teacher replied, “You’re right. Athletes play through stress fractures, breaks, things that the average person would not endure”. Hillary confirmed, “Gymnasts do that as well because they are afraid of falling behind and losing their spot on a team. That is why they diet and are anorexic…It’s a stereotype, but I think the more attractive skinnier girls get extra points, so they are encouraging eating disorders.” The teacher then posed another question, “There are many reasons for developing an eating disorder. Is it the sport that influences disorders such as anorexia and bulimia? 

Hillary’s curiosity and desire to fill in gaps of her existing knowledge and experience on the subject enabled her to develop deep research and alternative interpretations of the topic. She showed a good depth of knowledge when talking about content that satisfied a many of unanswered questions during previous conversations.

The development of an in-depth understanding of her topic were also influenced by discussions with Jenny. Slavin (1996) suggests that discussions with peers can motivate an individual to search for better solutions. This is evident in Hillary’s exchanges with Jenny. As explained in Hillary’s sequence of learning, it was an exchange with Jenny about a judge’s influence on results based on the gymnast’s appearance that may encourage gymnasts to develop eating disorders. As a result of this conversation, Hillary found that research suggests that athletes of all shapes and sizes scored well.

In her assignment entries, Hillary used her discussions to deliver an in-depth answer to her question. These answers were developed from higher order thinking which was assisted by conversation with another student (Jenny).

4.9.4 Student’s reflection on the learning process

Hillary believed that interactions supported by the program assisted in her in the guiding of her research and the progress of her answers. The process still allowed her freedom and this encouraged interest in the research. For example:

Otherwise we don’t have any direction of what we’re doing…. I think the freedom as well. You could pretty much research anything that had a link
to the question. So you weren’t restricted to anything not interesting…You could do something that you liked which made you actually work longer.

She also believed that peer collaboration was useful for reassurance and the checking of understanding. She suggests:

We all had partners it was like reassurance. Like you could always check with your partner.

Hillary enjoyed the process, but had some grievances about the functionality of some of the features of the program. She stated:

One of the save buttons didn’t work that annoyed me. And the text boxes were not that big… And also auto spell check things would be beneficial.

Hillary enjoyed the constant supervision by the teacher, but she liked the freedom to explore areas of interest. In this respect, it appears that she appreciated the facilitation process that this environment encouraged.

4.10 Mary

4.10.1 Student’s sequence of learning
Mary chose a question relating to obesity which was created by the teacher. It asked her to provide a critical examination of obesity on Australian society, explain how it affects the family, and analyse how culture may influence eating patterns.

Mary made a total of four assignment entries. In her first entry, she gave a brief explanation of obesity and outlined the Body Mass Index (BMI) table, which indicates the weight status of an individual in relation to their height and weight. The table indicated that if a person was considered underweight, normal, overweight or obese. The entry was very short and Mary did not make another assignment entry for the next two lessons. She did, however, have brief conversations with her peers about her topic. In this time, Mary only asked about the makeup of her question which did not assist her
in her research. For example, Mary explained to Amy that Mandy was focusing on government initiatives (in relation to obesity) and that she was looking at culture. Then she asked Amy if she thought physical fitness fit into Mandy’s section or her (Mary’s) section. This exchange was typical of Mary’s task related communication with her peers.

The teacher also had a discussion with Mary after the third lesson. The teacher asked Mary about her progress, to which Mary replied that she did not know what to do. The teacher asked questions about Mary’s research on obesity and culture, and Mary said that obesity probably had to do with attitudes. Hillary suggested that, like many people who suffer from anorexia, it could be psychological. The teacher then suggested to Mary to focus on one case study on why a particular person became obese. Mary replied, “Can I investigate the ‘Biggest Loser’?” (a television series in which the contestants attempt to lose weight). Mary said that the show gives a brief account of an individual’s life. The teacher agreed that Mary could look into the show, but she also needed to explain why individuals want to lose weight.

In her following two assignment entries, Mary gave a brief account of why people gained weight and some reasons why they wanted to lose weight. The information was presented in point form. For example, Mary wrote this extract outlining the reasons why people gain weight:

```
It is hard to maintain a healthy body weight:
- Because we rely on cars for transport instead of walking or riding a bike;
- Because we spend more time sitting at a computer doing homework, using the internet or playing games;
- Because not everyone has easy access to parks where we can be active;
- Because there are so many different foods to choose from it’s hard to know how to make a healthy choice
```

Similarly, in her fourth assignment entry she wrote the following extract outlining the reasons why people wanted to lose weight:
Why people want to lose weight (reasons suggested by contestant on the “Biggest Loser”):
- to be healthier
- be able to play with their kids
- because they have seen people with health problems that are obese and they don’t want the same thing to happen to them or their friends or family
- to feel better about themselves and increase their self esteem
- to fit in a car
- to walk up stairs and not be out of breath

Mary did not use analytical research or engage frequently in task-related communication. Thus evidence of socially constructed information was absent to this point (in Task 2).

Ensuing discussions with the teacher centred on the structure of the questions; that is, what is meant by ‘critical analysis’, ‘propose’ and ‘analyse’ when answering a question. The teacher restructured a final question in an attempt to draw a more analytical response from Mary. The written question asked Mary to propose one strategy that the government could employ to reduce obesity amongst economically disadvantaged people. The teacher also provided written suggestions (in the CMSCE program) for research such as,

Perhaps incentives or opportunities for people in low SES areas to exercise, eat well, get more check-ups, will assist in developing good habits. Also, think of ways this could be done, or, see what the government has already done and examine whether or not it would be effective.

Mary’s final assignment entry showed progress towards higher order thinking. She provided a modified proposal for reducing obesity. It stemmed from information obtained from the Australian government strategy on reducing the risk of obesity. She wrote:

Australia’s government strategy for reducing obesity is Building a Healthy,
Active Australia. It is a $116 million, four-year package announced by the Prime Minister in 2004. This strategy includes, encouraging families to adopt healthy eating and regular physical activity through providing information, promoting after school physical activity programs in schools and child care services, managed by the Australian Sports Commission, providing grants to non-government organisations linked to primary and secondary schools to initiate activities to improve their students eating habits, and increasing hours of physical activity undertaken during school hours.

Mary suggested that these strategies would work because:

Encouraging families to eat healthy and exercise will give the families good habits, which will be passed on by generation if it continues. It will also help maintain a good body and be healthy. But providing information wouldn’t leave a big enough impact on the families unless it shows the extreme cases on what could happen if you were obese. Providing this information to low socioeconomic status people will give them help notifying them on what the healthy option is and how to eat right.

Her findings were limited, but the social interaction with the teacher encouraged Mary to look deeper into the information she obtained and use higher order thinking skills to propose solutions.

4.10.2 Marisa’s task related communication

This section describes the communication from Mary to the teacher and to her peers in Task 2. It includes both oral and written communication and the different modes of communication. Table 4.10 presents the number of Mary’s meaningful task related phrases used in a variety of individual and group communication with teacher and peers.
Table 4.10 Mary’s communication with the teacher and peers

<table>
<thead>
<tr>
<th></th>
<th>Written (Total 2)</th>
<th>Oral (Total 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teacher</td>
<td>Peers</td>
</tr>
<tr>
<td>Discussion</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Question</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Facilitation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Comment</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Mary made a total of 23 oral exchanges with the teacher and her peers. Of these, 11 exchanges were comments, 6 were questions, 4 were discussions, and 2 were facilitation phrases. She also used written communication twice; 1 discussion phrase and 1 question.

Mary was limited in her effective communication, both orally and written. It took several lessons to engage Mary in her topic, and it was not until she was more motivated in the task that she asked any questions or engaged in any form of discussion. Her comments were made based on other students’ work and Mary rarely shared her research with other students. Her knowledge of her topic reflected this, as her presented work lacked the depth of knowledge that other students developed over the task.

4.10.3 Evidence of socially constructed episodes and development of in-depth knowledge

The discussions that Mary participated in throughout Task 2, did not show evidence of enhancing knowledge in her written work. Her discussions with her peers or teachers were not elaborate. This may be indicative of her previous learning experiences, but the task-related communication that she was involved in was brief and did not encourage deep thought about her topic.

Mary’s responses did not extend beyond the ability to provide fragments of a sentence which did not show understanding, and near verbatim responses to answers. This was
evident in all her entries, especially the first three in which she provided brief answers in point form. According to Chan et al. (1992), this was typical of a Level 1 and 2 ability to socially construct information.

Mary’s discussions were limited and were only made with the teacher. She required constant direction and motivation from the teacher. She struggled to do more than the minimum research to answer her question despite prompting. This may have had more to do with motivation than the environment. There was no other evidence such as alternative explanations or critical analysis of her research. When asked to examine obesity, she simply wrote down facts; For example, she wrote in response to the question, “what is obesity?”:

Obesity definition: Obesity is a chronic condition that develops as a result of an interaction between a person’s genetic makeup and their environment.

Whilst she found it hard to engage in discussion which may have assisted in the understanding of her topic, there was evidence of learning in her work. Her social interaction with the teacher led to a better performance. In her final entry she was able to provide a more analytical perspective on her question (Salomon, Globerson, & Guterman, 1989 and King, 1991).

4.10.4 Student’s reflection on the learning process
Mary appreciated the constant feedback from the teacher. She suggested that it helped her manage her question and give appropriate responses:

We got feedback all the way through it….And you ask a question, do you think you’ve done enough

Mary also suggested that it was a more effective way of learning and it gave her some motivation to pursue the research.
Her contribution to the group interview was small, but it appeared from her comments that she valued the assistance from the teacher in developing an understanding of the content she was researching.

4.11 General social construction patterns

The sequence of learning followed each student’s progress throughout Task 2. Each entry was recorded along with oral and written communication to show the social construction of knowledge throughout task 2.

The purpose of this research was not to compare students’ development, but it should be noted that the student who communicated more with the teacher or their peers, seem to produce more in-depth analysis of their questions.

There was no correlation between the number of entries and the quality of the work presented at the end of Task 2. Each student provided between four and seven entries, but students such as Lisa and Mandy, who exhibited in-depth knowledge and understanding of the question only provided five entries, whilst Sara made six entries, but did not display the same in-depth knowledge of her topic.

The sequence of learning did show that all students improved their knowledge and understanding, and their ability to answer the question. Each student’s progression, however, was different in terms of depth of learning and/or learning rate. Sara, Diane and Mary showed limited progress in terms of depth of knowledge compared with the rest of the students. However, there was evidence of significant development for each individual despite their level of interactivity with the teacher or their peers. Whilst no comparisons were made their sequence showed similar opportunities for learning through interaction with the teacher and other students, but Sara, Diane and Mary did not show the same depth of understanding of their research as the other students in their final entry.

Jenny, Amy, Lisa, Mandy, Ann and Hillary showed substantial improvement in their depth of learning and understanding of their respective topic. These students provided a good depth of knowledge in their answers, which resulted in a combination of their
research and discussions with the teacher. Jenny, Amy, Lisa, Mandy, Ann and Hillary also showed progression throughout Task 2, as opposed to Sara, Diane and Mary who only showed significant improvement in their last entries. One reason for this may have been their proclivity to discuss their work with others, especially the teacher. Having a more experienced person to help with understanding and the generation of ideas may have assisted the students in viewing the research from a variety of perspectives. This in turn may have helped them understand the content in greater depth.

The sequence also showed social interaction and social construction of information that occurred between students and between student and teacher. Most communication for all students happened between teacher and student. There was little correlation between the frequency of interaction and the teacher and the depth of learning. For example, Amy provided in-depth responses to her questions with relatively few discussions with the teacher, whereas Diane, who spoke with the teacher frequently, did not progress as efficiently. However, communication is better examined in the task related communication.

Task related communication indicates how often the types of communication (oral or written) and the mode of communication (discussion, question, facilitation, comments) occurred for each student. All students, except for Amy, engaged in both oral and written communication. Amy used only oral communication. It was evident in the sequence of learning that both oral and written communication assisted students in their development of knowledge and understanding.

More oral communication was recorded compared to written communication. The ability to converse orally was convenient and each student had the opportunity to socially construct their topic with other individuals. Most of the written phrases were discussions or questions and were often written to the teacher to answer questions or gain insight into their topic. Most of the oral phrases were discussions, questions and comments. Generally, students who showed more depth in understanding used discussion and questioning phrases more than other phrases. Students who used comments most frequently did not produce the in-depth answers of the other students.
Facilitation phrases were the least frequently used oral phrases, and were only used by the few students who took on expert-like roles.

Socially constructed information was based on their communication (oral and written) with the teacher and peers and their use of these discussions to develop their knowledge, which is observed in their entries into the CMSCE program. All students were willing to engage in conversation, which is evident in each student’s task related communication summary, but not all students could use the conversation to assist in learning and understanding their topic. Some students found it difficult to discuss their learning with the teacher or peers. Sara was an example of a student who provided some good research, but could not discuss her topic because of her lack of understanding. Whilst Diane and Mary also did not show a high inclination to socially construct information, their barrier was their lack of research skills. Jenny, Lisa, Mandy, Hillary, Ann and Amy all showed an ability to discuss their research and use the discussion to assist in their learning.

Each student’s proclivity to socially construct information affected the depth of their socially constructed episodes and in-depth knowledge. Diane and Sara had frequent conversation regarding their topic with the teacher, but were unable use this information to their advantage. Whereas, Hillary, Ann and Amy used discussions with the teacher to enhance knowledge from their own research. Mandy, Jenny and Lisa went further and used discussions with teacher and their peers to construct inferences and extrapolate knowledge not found in their research.

All the students who were present in the interview provided a positive reflection of the learning process. They enjoyed the frequent feedback and the opportunity to talk with others about their topic. They felt that it enabled them to develop a deeper understanding of the topic. Even students who struggled with answering the question expressed their appreciation of the teacher’s support and direction. Only technical issues with the program provided some negativity in the feedback, such as; the students believed a spell check feature would improve the usability. Also, the small size of font made it difficult to read, and the students suggested that a more user friendly web address would have made the CMSCE program easier to access.
There is evidence that some students adapted very well to this type of learning. Particular students in the class engaged in more peer social construction than others. Jenny, Lisa and Mandy were prolific (relative to others) using social constructivism as a form of learning. These three students were also amongst the students who gave the most detail and in depth knowledge in their work.

The students who engaged in the most social construction (all methods) created the best, most in-depth responses. They also had the ability to assimilate their new and old knowledge into real world problems. Perhaps this is because more discussion between people allows for a greater base of knowledge as well as a comprehensive view of real world problems.
5 CONCLUSION, DISCUSSION AND RECOMMENDATIONS

5.1 Introduction
This study was guided by the broad question asking how technology can be used to assist in creating an environment that fosters social construction of knowledge and allows students to develop a deep understanding of the content being taught. The Computer-mediated Social Constructivist Environment (CMSCE) program, designed by the author, was used as the technology medium and its effectiveness was examined through three research questions:

1. What are the characteristics of the mixed mode (oral and written) communication that is stimulated by this environment?
2. How does the active engagement in computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content?
3. What are the students’ perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and the learner in the project?

The design of the learning environment for this study was based on a social constructivist approach. This meant that during class time, students were encouraged to engage in meaningful communication with the teacher and other students about their topic in order to develop a deeper understanding of the content. The role of the teacher in this learning environment was that of facilitator and advisor.

Because the learning environment and methods were new to the students, they were provided with an introduction to the idea that discussions with peers and the teacher could enrich their understanding of the topic. As part of their learning, the students were encouraged to exchange ideas, to compare and contrast each others’ research, and to further each others’ research by asking questions and providing critical comments. The students were explicitly taught that the discussion of their inquiries with each other and
the teacher would help them to create an enriched answer to their individual questions. The term “social construction of knowledge” was introduced to the students.

The CMSCE program was created to incorporate writing in the process of exchanging of the ideas and, as such, to enhance the co-construction of knowledge by drawing on the strength of written language as a powerful complementary learning tool to oral communication (Shy-Jong, 2007). Previous research into the role of writing in the co-construction of knowledge (e.g. Land, 2004, Veerman et al., 2000, and Scardamalia et al., 1994) has found that written communication provides an opportunity for students to give elaborate explanations of their thoughts. However, communication in these studies was restricted to on-line interactions only (as explained in detail in Chapter 2, 2.3.2), limiting the applicability of the findings to learning environments which involve face-to-face interaction. In this study, the use of written communication was combined with, and was part of face-to-face oral communication during class time. The aim of this study was not only to use writing as a means for co-construction of knowledge, but to embed it in authentic classroom activities in which both writing and talking naturally blended to enhance learning.

Over a period of eight weeks the participants (nine Year 11 students) were required to complete a research project on a topic in an area of physical health, social drugs and physical activity. The students had to enter their work into their CMSCE page. Their research was a ‘work in progress’ and was available to be viewed by all members of the class, and it also allowed the teacher and other students to provide feedback. The students were required to make at least one research entry and they also were encouraged to write feedback to each other’s work.

The CMSCE program stored all electronic records of the students’ work entries, and their communication with teacher and other students. Oral conversations between students and between the teacher and the students during each lesson were audio taped and field notes of observations of interactions and the discussions were written by the teacher-researcher after every lesson.
This chapter brings together the findings of this study, firstly by presenting answers to each of the research questions and then summarising general findings related to the nature of the social construction of knowledge that occurred during the study. This is followed by conclusions derived from these findings and their implications for practice. The last section discusses potential directions for further research, and the chapter is concluded with a brief summary.

5.2 Summary of findings

The study captured a significant number of episodes of social construction of knowledge among the participating students in their communication with the teacher and peers in both oral and written modes of communication. It also permitted the teacher to directly link these to the development of the students’ deeper understanding of their topics.

During the eight weeks of the study, all the participants engaged in a variety of social interactions related to the topics, but each student’s progression was different. Whilst all the participants showed improvement in their knowledge and understanding, the students who interacted more with the teacher and other students generally produced more in-depth responses to their questions. However, even though direct links between the individual outcomes and the content of the discussion were traced to the entries that each student submitted, the relationship between the level of social interactions and individual learning are likely to be more complex than a simple ‘cause and effect’ relationship. Other factors, which were not part of this study, such as motivation, prior knowledge, and the ability to comprehend research material, amongst others, may also have influenced the quality of the learning outcomes.

The analysis of the study sequence in the individual cases showed that both oral and written communication assisted students in their development of knowledge and understanding. While oral communication was used more frequently, the students’ written communication was elaborate in its content and suggested deep thinking. Much of the oral communication between members of the class was expanded upon in the
written text. Thus, one form of communication supported the other in the learning environment supported by the CMSCE program.

The findings related to each research question are described in detail in the following three sub-sections.

5.2.1 Question 1: What are the characteristics of the mixed mode (oral and written) communication that is stimulated by the CMSCE environment?

The findings indicated that each mode of communication contributed to the development of the students’ understanding of their respective topics. Oral communication stimulated topic-related conversations and, consequently, more questions and answers emerged from each discussion. The discussions assisted students in the development of their understanding, which was evident in the written assignment entries submitted on the CMSCE program. This was facilitated through discussions with the teacher and peers and, consequently, assisted students in researching ideas further and consolidating their thoughts.

The extent of the written submissions was greater than in a traditional classroom where students’ independent projects usually do not have much input from the teacher and or peers. The topics of such assignments in a traditionally structured classroom are predominantly given to the students by the teacher, from which time the students work independently, submit only the final version of the assignment on the due date, and the teacher provides feedback on this version only. In this research study, students submitted four to seven entries. While they were only obliged to submit one entry as per the task requirement, the students were enabled by the CMSCE program to seek the teacher’s feedback and to consequently improve their knowledge of the topic through more iteration. The students demonstrated their keenness to receive feedback by submitting multiple entries. The program also revealed that the students accepted feedback from various sources, sought to build a knowledge base that satisfied their own curiosity, and were willing to express their newly developed knowledge through written submissions.
The examination of the characteristics of the mixed mode communication was used to determine how students’ written and oral communication supported their attempts to understand a topic and how these modes of communication complemented each other to create greater possibilities for learning and understanding content knowledge.

The characteristics of written and oral modes of communication were analysed using the four categories: discussion, questions, facilitation, and comments. The analysis indicated that, in this study, the four forms of communication (discussion, questions, facilitation, and comments) were used differently in written communication when compared with oral communication. Oral communication proved more versatile, whilst written communication was used for more elaborate questions and discussions.

Written communication was encouraged to be used in different ways, for example, the submission of entries, questions of the teacher and other students, and responses to written communication. However, it was also anticipated that because students were in the same classroom, students would be more inclined to communicate verbally about their topic rather than write to each other, as talking is a more natural and easier form of communication in the face-to-face context. The purpose of using the CMSCE program in the classroom was to investigate how oral and written communication could be used in conjunction, to help facilitate a social constructivist environment for learning.

The CMSCE program encouraged students’ use of writing in the development of their understanding by enabling them to provide more elaborate explanations compared to oral discussion. It was evident in this study that oral speech was often simpler than written communication, it was regularly abbreviated, and as a result, some meanings were misinterpreted. When the students wrote questions or submitted their findings, the writing allowed the students to express their thoughts and understanding of the research in a more explicit manner. Furthermore, significantly more words were used to express thought in written communication. Thus, the use of written communication demonstrated the valuable contribution it makes to the development of a deep understanding of the task content.
The following section further elaborates on the characteristics of written communication, whilst the sections following will discuss the role oral communication had in this study and how both oral and written communication combined to provide a socially constructive learning environment.

5.2.1.1 The characteristics of the written communication

The CMSCE program allowed the capture of the written communication of the students and the teacher. Specifically, the program recorded the written exchanges between members of the class and the resulting research and analysis from the individual student, which was analysed to investigate the progress of each student’s learning.

Written communication assisted students to develop answers to questions, facilitate other students’ learning, and provide comments on or insights into research. Most of the written communication, however, occurred between the teacher and student. The students posted their work in progress to the CMSCE and explicitly indicated in their text that they were expecting a response from the teacher.

The analysis of the data demonstrated that, while written communication was used less frequently, written expressions were more detailed than in the discussion engaged in through conversation. Two major types of written communication were identified: assignment entries (indirect communication) and direct communication (questions, discussions). Assignment entries were considered as a form of written communication because students entered the results of their research into the CMSCE program in the expectation of feedback from the teacher. The teacher made sure that he gave feedback after each entry and also asked questions, made suggestions on what and where to conduct for further research, and supported good submissions with a consolidating statement. Some students wrote direct questions to the teacher about their work and followed up with discussion style comments, which demonstrated a proclivity to write comments that would encourage feedback from the teacher. Two students, Amy and Hillary, did not enter any discussion comments or ask any questions of the teacher through writing. For example, Hillary verbally explained to the teacher that she had
answered some of the research question and asked the teacher to give some feedback to confirm that she was ‘on the right track’. However, this negotiation happened orally. This showed the importance of a learning environment which allowed for the use of both modes of communication.

Written questions to the teacher were generally focused on further avenues for research. For example, Mandy asked the teacher whether she should address Australia’s management of obesity by looking at Australia’s current policy. However, after the first two lessons, the number of written questions to the teacher dropped significantly and was substituted with oral questions in the classroom which were easier to manage and provided a quicker response. The only student who wrote to the teacher with direct questions after the second lesson was Lisa who was absent from class and wrote to the teacher enquiring about her work. Thus, this environment provided the opportunity for this student to get feedback from the teacher despite being away from the classroom. However, naturally, oral communication was the dominant form of communication whilst in the classroom. The immediate feedback from the teacher and students provided each individual with instant answers and reduced the need for written communication.

Only five of the nine students used writing to communicate to other students: Jenny and Mandy (3 phrases each); Lisa, Ann and Hillary (2 phrases each). These students used a variety of modes (sharing, encouragement, questions etc.) when writing to their peers, but again they only used these early in the task. The communication consisted of sharing notes, but as the students started to follow their own interests, the amount of written communication between students decreased. The opportunity of oral communication during class time proved more beneficial for many students. They could explain their topic to the teacher and peers, and receive immediate advice and feedback from the ensuing conversations. This would have reduced the need to receive feedback in written form.

The entries were considered written communication because they were works-in-progress by the teacher and the student. The students displayed their knowledge and understanding in each entry, and the teacher would comment on their work. All students
presented multiple submissions of writing and received feedback at regular intervals. It was found that the quality of their submissions improved as they worked through the task.

Whilst written communication did not occur as frequently as oral communication, the quality of higher order thinking (such as analysis and synthesis of information, etc.) was more evident in written work. Questions and discussions, which were submitted in written form on the CMSCE program, were often more elaborate and detailed, which demonstrated reflective thought, in terms of preparing the response, as well as depth of knowledge.

Written communication requires many more words than oral speech to explain the same idea (Burr, 2003). In this study, the written submissions demonstrated that students were able to make connections between their knowledge and research which assisted in assimilating new information.

Each written submission displayed analytical qualities and in-depth knowledge. However, the sequence of learning showed that much of the written communication was prompted by oral conversation that occurred between members during class time. The way that oral communication was used in conjunction with written communication is highlighted in the next section.

5.2.1.2 The characteristics of the oral communication

Oral communication was used more frequently than written communication which was not surprising as it is a natural form of communication in the classroom which allows for quick and flexible exchange of ideas. However, the results of this study showed that oral and written communication complemented each other, enabling a student to further develop their understanding. For example, written submissions were often a result of an oral discussion with the teacher or peer. It was also evident that written submissions stimulated oral discussion both with the teacher and the other students. Thus, determining the characteristics of each mode of communication and their balance gives
an insight into each student’s way of deriving information and developing an understanding of her topic.

The characteristics of communication were determined by categorising the mode of communication (written or oral) into four types: discussion, questions, facilitation, and comments. The characteristics of the communication was captured from the data and analysis of the data determined the four types of communication (refer to section 3.9.1 for clarification). The information that follows has been discussed within these categories, which allowed for comparisons of the type of communication and the social construction of knowledge.

The general oral communication that occurred in the classroom over the course of the study displayed the inclination of this cohort of students to discuss content of their work with their teacher. At the same time, students did also engage in discussions with their peers, especially in later stages of the study when the students felt more comfortable conversing about content with their peers. Most of oral communication, which was captured in the data collection, consisted of discussion, comments and questions (109, 100 and 94 phrases respectively out of a total of 342 oral phrases).

Oral communication occurred more often between teacher and student/s (207 phrases) than between student and student (135 phrases). These included more frequent discussion with teacher than with peers (81 recorded discussion phrases out of 109), and more questions directed to teachers than to peers (76 out of 94). This may indicate that the students were seeking more support from a more capable other.

Facilitation phrases were used during recorded conversations between students (49), however, for obvious reasons it was not used when discussing a topic with the teacher. The students who assisted peers in developing an understanding of their research were students who displayed more personal self-confidence and more confidence in their knowledge. Students with experience in a peer’s area of interest assisted their peers by providing information or insights about the topic which enabled the peer to achieve a greater depth of knowledge. For example, Jenny’s experience in elite sport assisted Lisa
to develop an understanding of why athletes train and compete while injured (see Section 4.6.1). However, not all the students were as willing or able to assist others.

Discussion and questions were typically used when conversing with the teacher. The discussions between teacher and students about topics often clarified thoughts or raised more issues for students to research. For example, an oral discussion which involved Hillary, Jenny and the teacher raised questions about the subjectivity in gymnastics judging and how it may be swayed by the gymnast’s physique. Hillary’s next two written entries consisted of personal reviews of The Gymnastics Federation’s judging policies and conflicting evidence from other sources. Consequently, Hillary exhibited more in-depth knowledge and understanding of the topic.

Verbal questions were used frequently throughout the study. Both the teacher and students used two types of questions. One type of question was used to ask for clarification. These types of question were closed questions and did not encourage further discussion. For example, during a discussion with the teacher, the teacher was explaining the ‘Active Australia Campaign’ to Sara. In response to the teacher’s description of the campaign, Sara asked, if the participants exercised for an hour. It is evident that Sara was seeking clarification of the process used in the ‘Active Australia’ campaign and not encouraging discussion.

The other type of questions, ‘strategic questions’ (King, 1991), sought a more elaborate response. The questions invited discussion and opinion sharing, and encouraged the student to provide a response that made connections and links to other content areas. These types of questions prompted students to examine the relationships between ideas and research content. For example, Amy sought to build on her understanding of the government’s health care system. Amy explained to the teacher that she found out that Medicare was designed to support all Australians equally. Then she asked the teacher if Medicare supported people with obesity, and if not, why not. This question requested an opinion on the relationship between the government’s philosophy of equity and the possible discrimination of obese people and resulted in further discussion with the teacher.
An example of a student using a strategic question when addressing their peers occurred when Ann was explaining to Sara some of the government’s methods of minimizing harm from drug use. Sara questioned the controversial solutions and, inadvertently, required information from Ann based on opinion. Consequently, Ann provided an argument that the government was in a difficult position, but was ultimately attempting to protect the general population.

Throughout the study, both types of questions were asked of the teacher and peers, but strategic questions were asked more frequently of the teacher. Amy’s strategic question enabled her to gain a deeper knowledge of her topic. This type of interaction illustrates how a partnership with a more capable peer can activate a mental operation so that a learner is required to gain an insight into the content being discussed (Salomon et al., 1989).

The two-way communication process was important in enabling construction of understanding. It was also important for the teacher to use particular discussion and questioning techniques, such as leading questions and questioning student’s interpretation of information, to ensure the students were thinking and reflecting on their research. This is further discussed in relation to Research Question 2 (see Section 5.2.3).

Comments only occurred in oral communications and were generally used as a form of acknowledgement of the other person’s point of view. Comments were used to a similar extent between teacher and student, and between students. For example, during a discussion about her research on obesity and culture, Mary commented that obesity probably had to do with the attitudes of the individual. The comment was a form of acknowledgement of the general discussion. Unlike a question which requires a response, discussions which lead to further discussions, or facilitation which assists another with understanding of her topic, comments generally end the thought. Comments may not have contributed to the information in the conversation, but they served to acknowledge information and support others.
When comparing oral and written communication, oral communication allowed the participants to give, and receive immediate feedback, which provided students with a greater insight into their topic. Oral communication also proved more versatile than written. Students could question, discuss, facilitate and comment more readily whilst talking than when writing. As noted in the previous discussions of written communication, answers and ideas emanated from conversations which advanced understanding. Some of the oral exchanges recorded between students were brief and off-task, but the opportunity to talk about their research provided a valuable learning experience and encouraged the students to interact frequently.

The next section examines the ways that oral and written communications complement each other in the learning process.

5.2.1.3 The characteristics of the mixed mode of oral and written communication

All students engaged in some form of interaction with the teacher, other students, or both, and as a result, all students used the oral discussions. The written submissions revealed that each student in the class entertained alternate view-points from others, advanced their knowledge with input from more capable others, or consolidated their existing knowledge with a greater variety of examples, demonstrating how oral communication is a way of developing thought (Smagorinsky, 2007).

The results of this study show that individually, oral and written communication can provide a forum for social interaction and for students to share ideas. Together, written and oral communication can provide many opportunities for students to socially construct knowledge formally in the written form or informally through oral speech.

As discussed above, both written and oral communications were used as a means of interaction and both contributed to the process of knowledge construction. Even though they were used with different frequency, they interacted with each other to enhance and reinforce the students’ learning. Each student’s final entry displayed improvement in their understanding of the content they had studied. Written work, documented on the
CMSCE, demonstrated the students’ development of knowledge and understanding as a result of the interaction fostered through oral communication. When examining the sequence of learning for each student, it was evident that their written work was influenced by oral discussions and the exchange of ideas. Thus, much of the knowledge was constructed through oral communication with the teacher and/or peers. Likewise, oral communication was prompted and enhanced by the written entries. Oral and written communication, therefore, complemented each other and the characteristics can be seen as the two forms of communication co-exist and “cooperate” with each other to provide a greater opportunity to learn. Analysis of the interrelation between written and oral communication showed how both contributed to the development of a student’s understanding in a way particular to that student.

Participants in the study frequently discussed their own and others’ topic orally. Many students used the conversation with the teacher and each other in their responses based on the reading of entered written text (the analysis of each student’s task related communication is described in detail in Chapter 4). A greater amount of immediate feedback was received and given in oral exchanges, enabling a more enhanced insight into content being examined. Written communication was used mostly for questions and facilitating others’ learning. The advantage of written communication was that information could always be referred back to. It became a working document that enabled students to revisit their work and build on ideas. Also, the written submissions provided the students with an opportunity to consolidate their thoughts and present a more thorough and elaborate response to their question.

This study found that CMSCE stimulated a great deal of communication and created a language-rich environment for learning in mixed mode communication. This resulted in the activation of thinking skills that the learner would have had difficulty engaging in without the appropriate “metacognitive” guidance (Salomon et al., 1989). Similar learning situations occurred when students engaged in discussions with peers who were considered more experienced in a particular domain.

Written communication had its limitations (Hull & Saxon, 2009), namely the absence of visible and audible cues, which often give further details to an explanation. In this
study, oral communication was used to complement written communication and compensate for its limitations. Generally, it was found that the students who engaged in significant oral communication displayed high quality responses to their questions. The same students also engaged in a wider variety of different forms of communication. It is not suggested that this shows a cause-and-effect relationship. This connection, perhaps, can be attributed to a high level of cognitive and meta-cognitive learning skills of these students. However, this is beyond the scope of this study and may be an avenue for further research.

5.2.2 Question 2: How does the active engagement in the computer-mediated interaction with the teacher and peers affect students’ learning (both the process and the outcomes)? Does it lead to developing an enriched and deep understanding of the content?

The CMSCE program enabled the students to engage in communication with the teacher and peers constantly throughout the task. The students had unrestricted access to the Internet-based program as long as they had the Internet available.

As discussed in the previous section (5.2.1), both oral and written communication contributed to the learning of each individual student. Written submissions, whether it was questions or comments to the teacher or other students, or an assignment entry, provided opportunities for students to receive feedback and develop a deeper understanding of content knowledge. The extent of the learning and understanding developed by each student was analysed in their sequence of learning. Each written entry and oral communication was tracked throughout the task, which gave insights into the development of each student’s learning. Each student’s engagement in social interactions, both oral and written was examined. The resulting assignment entries were categorised, based on a number of criteria (Chan et al., 1992) into levels of socially-constructed knowledge, which ranged from low to high. The lowest levels of social constructivism were determined in the students who could only utilise isolated words or fragments of a joint conversation in their individual assignment entries, but did not make use of its meaning. Sometimes they were only able to include factual information
and were unable to provide an elaborated response which demonstrated higher order thinking. They were only able to paraphrase information showing some basic understanding. Greater levels of understanding, which resulted from social constructivism, were identified when students could solve problems by referring to research and to personal knowledge to explain new information and/or could construct inferences and extrapolate knowledge not already known or shown in the text (based on Chan et al., 1992, as described in more detail in Chapter 3, Table 3).

The data analysis demonstrated that the students who were confident in discussing their topic with the teacher and peers also developed their knowledge in collaboration with them at a high level of social construction (Jenny, Lisa, Mandy, Hillary, Ann). The development of their understanding in connection to such discussions, demonstrates the importance of social interaction whilst learning in the computer-mediated environment. For example, Jenny was able to use her discussions with the teacher and her peers to expand the content of the discussion further, to take the clues and suggestions from the others to construct new knowledge. As a result, she developed a deeper understanding of the content which was reflected in the sequence of her task entries. Salomon (1989) suggested that a person is capable of mastering cognitive skills in partnership with a more capable person. Jenny was able to produce high quality answers which were synthesised and generalised and which she was able to transfer to different contexts. Additionally, her discussions with the teacher did not only influence her assignment entries, but also equipped her to assist other students with their learning. For example, Jenny used knowledge developed from her own research topic (the Ottawa Charter) to help Ann with her topic. Jenny, in an oral discussion, applied the Ottawa Charter to the content of Ann’s topic which assisted her with her research. This demonstrated that Jenny was able to extrapolate the knowledge constructed as a result of social interaction with the teacher and apply it to another area of study, thus demonstrating a high level of social constructivist learning (the standard of social constructivism at Level 5, according to Chan et al., 1992). Another example of a student showing an ability to transfer knowledge to solve a problem in another domain was Mandy’s ability to apply a Canadian Government strategy to an Australian problem. She determined that the structure and make-up of the Canadian and Australian population was similar. Catering to a multicultural society had enabled the Canadian Government to successfully develop
a solution. Thus, Mandy reasoned that the Canadian solution could be applied to Australia’s problem because of the relatively similar circumstances that both countries experience. Both Jenny and Mandy were able to present solutions based on their research, which was assisted by their genuine interest in the topic. This differed from a student who simply recalled some discussed facts or recited presented information and therefore was only learning at Level 1 or 2, which was evident in some of Mary’s entries. By comparison, Jenny’s learning development demonstrates that the use of CMSCE program enabled her to “internalise external information and build on current knowledge” (Cobb, 1994, p. 8) and therefore, socially construct her own understanding.

Each of the students started their study of the task differently. Having a choice of questions at the beginning of the task, some chose from a selection created by the teacher (five students), but some preferred to negotiate a question with the teacher based on three areas of the curriculum: physical activity, nutrition and social drugs (four students). On examination of each student’s progress, the dynamics of the learning was different for these two groups. Generally, the students who negotiated their question showed evidence of a higher level of social construction of knowledge. This might indicate that the students’ learning skills were at different stages of development, that is, more advanced students were more likely to choose their own topic. Students who felt confident negotiating their topics also appeared confident in discussing their findings with others. This suggests that ownership of learning might also have a part to play and that by having a stake in the learning, individuals were more inclined to pursue answers and develop understanding of their topic (Bronack et al. 2006).

All students used the opportunity to submit multiple entries in order to receive feedback from the teacher. However, evidence of learning and understanding was not based on the number of entries, but the level of engagement apparent in the social interaction with the teacher and peers. Some written entries demonstrated evidence of analytical thought and further research, whilst others re-formulated presented information in their own words. While the number of assignment entries from each individual varied from four to six, this did not seem to have a bearing on the quality of research or the level of social constructivist learning that occurred. This is evident because according to the data, students who produced more analytical research and who engaged in a higher level
of social constructivist learning (such as Jenny, Lisa and Hillary who made six, five and five entries respectively) made a similar number of assignment entries to Sara (six entries) who did not demonstrate as high a level of social constructive learning as the others, nor did she produce as much analytical research in her assignment entries. It has been suggested that students who engage with their teacher or peers more often are able to develop a deeper understanding of the content (King, 1991). Jenny, Lisa and Hillary were able to clarify understanding and gain an insight into a problem through frequent engagement. Sara’s progress suggests, however, that frequent interactions with the teacher did not automatically develop a deeper understanding of the content. This may have been because of her lower level of social constructivism. As explained by Chan and colleagues (1992), students at a Level 3 (Sara) only have the ability to paraphrase what they have learned and can only add some personal knowledge to their written work. By comparison, Jenny, Lisa and Hillary wrote material which was consistent with Level 5 in that they were able to extrapolate ideas from their research and provide a more analytical response to their questions. Despite the variety of levels of social constructivism from the students in the class, examination of the sequence of learning showed that all students benefited from the feedback from the teacher after each entry. Each student responded to the teacher’s feedback through an adjustment of research and/or thought processes and expressed their new understanding in subsequent entries.

The analysis of the recorded sequence of events that led to a final submission of each student’s research (assignment entries and written and oral communication episodes) demonstrated that all students developed their understanding differently, but all showed a progression in their understanding of the topic. Some students had a greater tendency than others to engage in written discussion with the teacher. When used, this interaction enabled the student to consolidate her understanding of her research and develop further insights into a topic. Several students also engaged in discussions with peers, which assisted them in understanding their topics from several perspectives because of the different ways of interpreting information.
5.2.2.1 Evidence of the influence of social construction of knowledge and deep understanding of the content

As discussed earlier in this chapter (Section 5.2.1), communication with the teacher and peers enabled all the students to develop a deeper understanding of their research question. It extended and consolidated their understanding and prompted students to search for a more complete answer to address their questions.

In order to support the use of the Computer-mediated Social Constructivist Environment (CMSCE), the teacher implemented a small assignment prior to the main learning task to scaffold the social constructivist process and prepare the students for collaborative learning. The students were asked to examine specific information as individuals, then in pairs, and then in groups of four. During each encounter, students documented the new ideas they had learnt from their peers and annotated each new idea to explain how it complemented or transformed their own perception of the topic. This preparation was used to assist students in accepting constructive feedback from their peers and the teacher as part of the process of developing a deeper understanding of the content studied during the main task.

Throughout the main task, the teacher approached each student differently depending on the student’s level of understanding at a particular time. For example, Hillary developed a well-informed understanding of her topic based on her personal experiences and a high level of research. The questions and discussion between the teacher and Hillary were designed to question Hillary’s ideas. The teacher’s questions were aimed at encouraging Hillary to make the next step in developing her understanding, and to generalise her previous knowledge and transfer it into another context. For example, the teacher asked Hillary why she thought gymnasts were particularly susceptible to eating disorders and whether there was any evidence of this. In contrast, Mary found the process of learning through discussion and social constructivism more difficult and therefore the questions put to her by the teacher were at a lower level and more directive than guiding. Mary had trouble using analysis in her responses, demonstrating difficulty in understanding the content, and so the teacher structured a written form of feedback to assist her. For example, the teacher asked Mary to propose one strategy that the government could employ to reduce obesity amongst economically disadvantaged
people, hoping that Mary would use her existing research to develop an answer. Thus, the teacher’s strategy and feedback was significant for maintaining students’ engagement and helping them to move forward in answering the question. Each student used the written feedback to assess her current approach to the questions, and as a basis for further research and knowledge.

Based on the levels of social constructivist learning (Chan et al., 1992), students who are more inclined to engage in discussion with their peers are able to construct ideas and extrapolate information from what they research. Whilst speaking to their peers about their own topic that they researched, some students were able to take an “expert” stance. For example, when presenting her topic to other students, Ann was able to undertake a critical view of government solutions of drug abuse. She suggested that there were ethical problems for both the government and the general population. The expert role pushed Ann to a higher level of performance and allowed her to draw on her research and provide answers that were based on her research. Chan and colleagues (1992) suggest that students, who extrapolate knowledge not already known, socially construct information at the highest level (Level 5).

On the other hand, students, such as Sara, Diane and Mary, who only interacted with the teacher, may have been less confident in suggesting their own alternative solutions because the teacher’s existing knowledge may be different to the student’s interpretation of the research. So, they spoke less like an expert on the topic because they did not feel like an authority on the topic.

When students conversed with each other, they created opportunities to discuss their ideas and this provided a forum for social constructivist learning. The feedback from peers may have encouraged students to search for better solutions, as proposed by Slavin (1996). For example, Hillary’s research into eating disorders amongst gymnasts resulted from a conversation in the classroom between the students and the teacher. Suggestions in the conversation that slimmer athletes got better marks from the judges prompted Hillary to find information that may be able to answer the question. It has been suggested that communication between peers can help build mastery of knowledge through social processes, such as participation and argumentation (Shy-Jong, 2007).
This was evident in Ann’s discussions on different governments’ initiatives in reducing the harm of drugs such as ecstasy. Her research had identified several points of view and the subsequent discussions with fellow students provided a more in-depth review of the proposals. Ann told the class of a proposal from the government and then provided arguments for and against the proposal. Thus, Ann demonstrated her depth of knowledge through the explanations about her thoughts on her research which she gave to her peers.

While all the students showed a significant increase in their understanding of the topic, the level of social construction of knowledge was different. Even though all the students had their own individual characteristics of social engagement in learning, two distinct groups seemed to emerge from the analysis of the data. One group, which included Jenny, Hillary, Mandy and Ann, negotiated their question and showed more interest in choosing their topic and its further discussion. They frequently discussed their topic with teacher and students and demonstrated higher levels of social constructivism (Chan et. al, 1992). The other group included Sara, Diane, Mary, Lisa, and Amy. They chose a question from the teacher’s list and were happy to be led in their learning, and generally produced lower levels of social construction. They discussed the content of their topic less frequently with the class. Not everyone fitted in this classification. Two students (Lisa and Amy) could not be clearly classified in either of the groups. Lisa chose a question from the teacher’s list, but exhibited high levels of social constructivism and frequently engaged in conversation with the teacher and her peers. Amy also chose a question from the teacher’s list, and demonstrated high levels of social constructivism, engaged in frequent topic related discussions with her teacher, but did not engage in conversations with her peers. Table 5.1 summarises the student’s levels of social construction.
Table 5.1: Summary of student’s levels of social constructivism

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Negotiated own Topic</th>
<th>Interacted with both Teacher and Peers</th>
<th>General Level of Social Constructivism (see Table 3.3; Chan et. al, 1992)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sara</td>
<td>No – Chose question from teacher’s selection</td>
<td>Yes, but limited meaningful interaction with peers</td>
<td>Level 3</td>
</tr>
<tr>
<td>Jenny</td>
<td>Yes</td>
<td>Yes, frequent and meaningful interaction with the teacher and peers</td>
<td>Level 5</td>
</tr>
<tr>
<td>Lisa</td>
<td>No – Chose question from teacher’s selection</td>
<td>Yes, frequent and meaningful interaction with the teacher and peers</td>
<td>Level 5</td>
</tr>
<tr>
<td>Mandy</td>
<td>Yes</td>
<td>Yes, frequent and meaningful interaction with the teacher and peers</td>
<td>Level 5</td>
</tr>
<tr>
<td>Hillary</td>
<td>Yes</td>
<td>Yes, frequent and meaningful interaction with the teacher and peers</td>
<td>Level 5</td>
</tr>
<tr>
<td>Ann</td>
<td>Yes</td>
<td>Yes, frequent and meaningful interaction with the teacher and peers</td>
<td>Level 4</td>
</tr>
<tr>
<td>Amy</td>
<td>No – Chose question from teacher’s selection</td>
<td>Discussions were predominantly with the teacher only</td>
<td>Level 4</td>
</tr>
<tr>
<td>Mary</td>
<td>No – Chose question from teacher’s selection</td>
<td>Yes, but limited meaningful interaction with peers</td>
<td>Level 1/2</td>
</tr>
<tr>
<td>Diane</td>
<td>No – Chose question from teacher’s selection</td>
<td>Yes, but limited meaningful interaction with peers</td>
<td>Level 2/3</td>
</tr>
</tbody>
</table>

For the students who demonstrated higher levels of social constructivism the opportunity to explore areas of interest coupled with the communication with the teacher and peers may have contributed to the learning process. These students had the opportunity to examine their research from multiple perspectives because they shared their knowledge with the teacher or peers. The teacher and peers presented their opinions and this gave the student a more comprehensive learning experience. For
example, in researching her chosen topic Mandy explored several countries’ solutions to the obesity epidemic based on the country’s demographic and wealth. She developed a credible solution to Australia’s obesity problem and justified her answers based on existing evidence. This suggests that Mandy’s intrinsic interest in the topic she chose may have given her impetus to explore several avenues for a solution, broadening her knowledge and deepening her understanding in a ‘continuous question-answer-question cycle’ (King, 1989). Mandy followed this process until she was satisfied with her understanding of the content. This was similar to Ann and Jenny who both viewed several perspectives on government initiatives before developing possible solutions that the government might consider. Hillary’s topic was also based on her personal interests and experiences. The opportunity to explore information that affected her personally seemed to assist her in developing a deep understanding of her topic.

The students who demonstrated higher levels of social constructivism were also more inclined to engage in conversation with both the teacher and peers, and provide a more analytical view of their research. Their high levels of confidence and knowledge of their topics may have assisted them in conversing with others and explaining their points of view, which in turn would have helped in their analysis. These students who discussed their topics with the teacher and peers used their research to justify their ideas and were able to provide examples to help with the explanation. This enabled the students to put theory into real world contexts. Higher order thinking skills such as synthesis of knowledge, generalisation of content, and hypothesis of theories (Palincsar, 1998), were most evident with those students who were motivated to engage in social construction in all forms and, consequently, research further to fill gaps in the knowledge created by the questions of their peers and the teacher. Curiosity and interest arising from discussions helped these students investigate their topics and create a deeper understanding.

Even though Lisa did not negotiate her own study question, she exhibited similar learning patterns to the students who demonstrated a higher level of social construction of knowledge; that is, she synthesised and generalised her knowledge and put it into other contexts. It could have been that Lisa was already interested in this topic, so despite the fact it was one offered by the teacher she still felt a high level of ownership over it. Her review of physical activity included elite athletes playing with injury. She
interviewed an elite athlete and used this information together with existing research to draw conclusions based on a variety of perspectives.

Diane, Sara and Mary seemed to progress only with the teacher’s guidance. The teacher’s approach in supporting the learning of these students was different to the other students in the class. The teacher’s explanations were more frequent and there was less discussion about the topic. The students required more leading questions from the teacher to give them impetus to explore their topics and make analytical judgments based on existing information. An apparent reluctance to select a question may be indication that these students were not ready for this type of learning and, as with other classroom experiences they were more familiar with, were expecting to be told what to do by the teacher. Sara showed evidence of this early in her sequence of learning when she recited information that she had researched, but was unable to explain the meaning behind it, showing that she could remember the answer, but did not understand it well. This demonstrates that Sara socially constructed information at a Level 3, according to Chan et al. (1992), because she could only paraphrase information and did not validate her understanding with an explanation from her own perspective. It is argued that dependence on a more capable peer may be necessary for learners to activate mental operations such as analysis and problem solving (Salomon et. al.1989). Diane, Sara and Mary developed their knowledge throughout the task, but it could be suggested that without the learning partnership with the teacher, each student’s growth in knowledge may have been minimal. Further, each student’s ability to analyse the content researched was extended because of the partnership with the teacher.

Amy was the exception in the class. She selected her question from the teacher’s list, but unlike Diane, Sara and Mary, provided thorough research and analytical reviews. She was able to utilise her learning partnership with the teacher to a greater extent. Despite this, she was also unlike the students who negotiated their own questions in that she only conversed with the teacher. This may be because her avenue of research was unique. Amy examined Australia’s health care system and this did not relate to any other individual in the class, which may explain why she did not engage in discussion with peers about content. The unique content of her research may have inhibited Amy’s level of social constructivist learning which may have hindered her ability to extrapolate
ideas and relate her knowledge to other contexts (which is indicative of Level 5). Other factors such as individual characteristics or cultural background may have influenced Amy’s interaction with her peers, but she was able to show greater levels of self-questioning techniques that, according to King (1992), stem from higher order thinking than some other students in the study. She was able to relate the discussion from the teacher to her own research and draw conclusions based on several sources of information. King (1992) suggests that this helps the social construction of knowledge.

In summary, the students who provided more in-depth research typically engaged in more interactive discussion, as well as cooperative learning, which showed that a greater collaboration between peers can provide a forum for learning and developing knowledge (Slavin, 1996). The questions arising from discussions helped students with their research and created a deeper understanding of the content, which was apparent in each student’s presentation of her work orally and written in the CMSCE program. Students with a higher proclivity to socially construct their knowledge showed a high correlation to producing in-depth research and a greater understanding in content area. It must be emphasised that this suggests a possible relationship rather than causality. Perhaps those students used discussion as a catalyst for constructing their written responses. It might also mean that the students who wrote more also researched more and, consequently, were more inclined to be open to other people’s views because of their desire to find answers. These students also engaged in the higher levels of socially constructed learning, as defined by Chan and colleagues (1992). However, Amy engaged in discussions exclusively with the teacher and she sought very specific details to verify her knowledge and further extend her understanding of her research. This resulted in an improved mastery of knowledge and understanding as described by Salomon and colleagues (1989) who suggest that a more capable other can activate mental operation such as analysis and synthesis which develops a deeper understanding of the content. Amy used the teacher’s guidance in developing a deeper understanding of Australia’s health system and was able to provide an analytical view on the role of Medicare and the various private health insurance companies in maintaining a quality health system. This demonstrates that the level of social constructivism and its relation to learning and understanding suggested by Chan and colleagues (1992) may be used only as a guide to determine the level of social constructivism that each student
engaged in. Some of the differences between the levels may be blurred, as Amy demonstrated with her in-depth responses despite her exclusive content discussions with the teacher, without interaction with her peers. However, it is also evident that Chan’s levels demonstrate that frequent and purposeful engagement with a variety of individuals, including a more capable other, can help a person understand content at a deeper level.

5.2.3 Question 3: What are the students’ perceptions of such learning? What are the ways that the designed program can be refined and adjusted to accommodate the experiences of the teacher and the learner in the project?

5.2.3.1 Student’s perception of learning environment

This section presents the results of the students’ focus group interview, which was conducted by a colleague without the influence of the researcher. This reduced bias and provided a greater opportunity for the students to express their genuine perceptions of the CMSCE program. The interview was conducted as a group interview and was recorded on an MP3 player. All but one student participated in the group interview (Amy was absent because of illness). The questions asked were designed to determine what the students thought about the learning experience which was supported by CMSCE program (for full list of questions see Appendix F). All the students spoke positively about the learning environment and the program. Their responses highlighted the importance of both oral and written communication in learning about a topic. Specifically they valued feedback, discussion and questions which were based on the multiple entries of their work in progress into CMSCE.

According to the students, the CMSCE provided a valuable learning experience. Hillary suggested that it provided her with an opportunity to discuss her task with the teacher, which assisted in giving her direction. As previously discussed, it was evident from the analysis of the students’ assignment entries and their written and oral communication records, that communication with members in the class significantly contributed to the
development of each student’s deeper understanding of their topic. The results of the interview confirmed this.

Oral communication with the teacher and peers occurred in every lesson and, according to Sara, Diane and Jenny, helped students to understand their topic. For example, Diane explains that when she felt she was off task or not sure about her understanding of the research, she would write a question to the teacher. She expected clarification or confirmation of her thoughts. These comments support suggestions that feedback and debate with peers motivate a learner to search for more answers (Slavin, 1996). Oral discussions in the classroom ensured that students received immediate feedback throughout the task which enabled them to continually modify their thinking. Jenny said that the constant discussion with the teacher and peers helped her remember and understand the content. She further commented on the knowledge she developed as a result of the discussions, saying, “my overall understanding is really deep now”. Lisa mentioned that talking with peers not only helped her understand her topic, but helped her learn about other students’ research as well. Lisa also commented that the discussions enabled her to gain insights into her own topic by seeing things from a different perspective. Mandy and Ann explained that they learnt more about their topics because they frequently discussed their research with the teacher and other students in the class. Such interactions are suggested to offer an opportunity to verbalise thoughts and provide a detailed explanation of understanding, thereby creating a deeper understanding of the content (Gauvin & Rogoff, 1989). The comments from the students make obvious the benefit of discussing their ideas with others, despite their level of expertise.

Written communication generally occurred with the teacher, but the students also found the written feedback benefited their learning experience. For example, Sara explained that written communication with the teacher was important for her, as it provided guidance throughout the task. Diane commented that she looked forward to the feedback from the teacher and it motivated her to keep going, while Mary said the written feedback helped keep her on track. Lisa explained that the written feedback helped her understand her work more comprehensively, which may not have occurred if she was to complete the assignment on her own. Thus, it was obvious that the students
valued learning in discussion and partnership with a more capable peer, such as the teacher. This provided them with what Salomon and colleagues call “metacognitive-like guidance” which assists a student in understanding content (Salomon et al., 1989).

According to the students’ comments, the CMSCE program seemed to provide a different way of learning for most of the students. The opportunity to develop their responses through discussion with members of the class, as well as submitting multiple drafts of answers with the aim of refining a response, was a new way of approaching learning for the students. It is apparent from the students’ responses in the interview that the learning process was different to most of their previous experiences in that they could discuss ideas orally and in written form continuously. In addition, students could post as many assignment entries as they liked and they would receive feedback orally in class and in written form through the CMSCE program. Jenny explained that the process motivated her and she felt she knew the topic very well on completion. She also said that her interest in the topic, coupled with the relaxed learning environment and the opportunity to discuss her topic with others, made the process enjoyable. Diane and Lisa agreed and both indicated that they did work in their own time (outside the class) because they were motivated and interested in their topic. Hillary said that she enjoyed the freedom to explore her topic, which motivated her to learn and talking to peers encouraged her to understand. Mary suggested that the help from the teacher encouraged her to be more purposeful in her pursuit of answers. This response to this type of learning suggests that the social interaction, both orally and in the written form, enabled the students to learn with motivation in a comfortable atmosphere. The constant feedback from the teacher (both oral and written) provided direction for the students which gave them more confidence in their responses, perhaps adding to the relaxed approach to learning. This is consistent with the results of other researchers (Dahms et al., 2007; Smagorinsky, 2007; & Burr, 2003) who found that students are more confident in their research and interpretation of their research when they are given constant feedback from a more capable other.

All students suggested that the learning process with CMSCE program was very helpful because they did not have to carry computers or hardware to transport information, nor did they have to continually download their work or email it. It was always available
wherever they had Internet access and the convenience of having all the feedback and the drafts at hand was beneficial in the learning process. Work could be done in the students’ own time and the students suggested that this made the assignment more “relaxing”. This demonstrates the flexibility of the learning environment, which the technology afforded because it provided the students with the freedom to explore their own interest relating to the content in their own time. The students’ answers suggested that they enjoyed the learning experience, commenting that it helped them develop a better understanding of the topic and that it also motivated them to complete the work.

In the interview, the consensus from the students was that the feedback from the teacher was highly effective as a learning tool. Jenny, Sara, Diane and Lisa said that the feedback from the teacher was invaluable and the discussion with classmates ensured they knew the topic extremely well. Even the students who did not produce as much in-depth research as others believed that the feedback from the teacher helped them to understand their topic. These students remarked that receiving more specific written feedback and more assistance than they would normally have, helped them in their understanding of the question and in finding information that would assist in their research. The students’ perceptions of their learning confirmed the findings in regards to the positive learning benefits of active engagement with the teacher and peers and the fact that it led to development of an enriched and deep understanding of the content.

According to the students, the discussions with other students also helped develop understanding. Jenny suggested that interaction with other students was beneficial because other students had the same level of knowledge and understanding. Sara and Lisa agreed and they explained that it was often easier understanding the explanation of other students because they explained ideas in words they could understand. Students were also more likely to include more details than the teacher in their explanation. The comments from these students demonstrate that collaboration between peers added a valuable dimension to the learning process (i.e. viewing things from varying perspectives gave a deeper knowledge of their topic). It is an example of how peer collaboration can afford another source of explanation which often provides greater
clarity of ideas and presents multiple sources of understanding (Gauvin & Rogoff, 1989).

Generally, the students believed that the CMSCE program provided opportunities for discussions with the teacher and other students. Also, it was “convenient for keeping records of work and feedback, helped them in managing responses to questions, and was an enjoyable learning experience”. However, according to the students, the CMSCE program “was not always user friendly”. The students explained that the “size of the writing was too small” and the capabilities of the program were limited, for example there was no spell check option available. Improvements in the usability of the program need to be made in order for the students to be able to focus on learning rather than the capabilities of the program, in line with suggestions from Cuban and colleagues (2001).

In summary, the students said the positive features of the CMSCE program were that it provided opportunities for discussions with the teacher and peers, which helped their learning. It was also convenient in keeping records of work and feedback, and managing responses to questions. Some students suggested that the feedback aspect of the CMSCE program motivated the students to conduct research independently. The interview also determined that the CMSCE program provided a means for communication in the written form and was useful to students because it allowed them to receive continuous feedback, which they felt facilitated learning. This feature of the program assisted them in constructing better responses. The students also said that they enjoyed the oral communication with their peers and the teacher which was a significant part of their work on the assignment. Oral communication in combination with written entries provided a more comprehensive learning process.

5.3 Discussion

This study was exploratory in nature and the qualitative case study approach allowed the researcher to investigate specific aspects of the use of the computer-mediated environment by each individual student and the students as a collective. The study
captured specific details using a range of data sources to provide complementary and confirmatory information. It examined characteristics of communication stimulated by the environment and the ways that the CMSCE program assisted the interaction with the teacher and peers in order to enhance learning and enable an enriched understanding of the content. The study also examined students’ perceptions of the learning environment.

Even though generalisations from this study are limited, they might allow practitioners to utilise similar teaching methods in other teaching environments. The study had a stronger external validity because it was conducted in its natural setting (Mertens, 1998). However, applying the CMSCE program in a different school with different teachers and students may have not produce the same results as this research. The students, the school and classroom environment and the teacher’s epistemological perspective are likely to influence the outcomes. Of particular importance is a teacher’s pedagogical approach to teaching and the willingness to create and support a social constructivist environment in the classroom.

Those students, who negotiated their question, and therefore may have had a greater stake in their learning, seemed to produce better understanding. Smagorinsky (2007) also suggests that ownership of learning increases the pursuit of knowledge in an individual. However, this could also mean that the students who were more advanced in their skills, were more eager and interested in their work and were more likely to choose their own topic. Perhaps if all students were required to choose their topic, it could determine whether those students who had greater stake in their topic were more inclined to develop a better understanding of their topic. However, an experimental comparison may be required to determine conclusive answers. The experimental comparison could also determine if these students produce higher order thinking skills and were more motivated to engage in social constructivism in all forms.

While this study showed that there may be a relationship between the frequency of oral communication and high quality responses, it could not be determined whether there was a cause and effect relationship. This connection could be attributed to a high level of cognitive and meta-cognitive learning skills of these students. Also, students with a higher degree of proclivity to discuss their topic with others tended to produce in-depth
research and demonstrated a greater understanding in their content area. However, this suggests a possible relationship rather than causality. It could be said that those students used discussion as a catalyst for constructing their written responses, but it might also mean that the students who produced a more elaborate response researched more, and after extensive research, were more receptive to other people’s views because of their desire to find answers. Further research on the relationship between communication and understanding may determine how this purposeful communication can assist learning.

The environment that the CMSCE program developed allowed an individual approach to teaching students with different learning rates. Some students struggled with understanding concepts and needed extra assistance in developing their understanding, while other students needed to be challenged. This was a diverse ability classroom, and in this environment, the teacher was able to deal with all students. If a student showed particular interest in an area (within the boundaries of the assignment’s objectives), the teacher asked questions that allowed the interests of the student to be explored. The teacher ensured that the student covered the content that was mandatory in syllabus, but with their curiosity aroused, the student demonstrated an eagerness to learn more. Interest is a powerful intrinsic motivator, which can assist students in trying to understand concepts with greater depth (Salomon, Perkins & Globerson, 1991). If the concepts are more fully understood after they have learned it through discussions with the teacher and peers, then an individual can know the work, and better still, develop theories that will emanate from the original concept. There also appears to be a relationship between more frequent communication (oral and written) and improved learning outcomes.

Scaffolding the social constructivist learning method is important to successfully using the CMSCE program. If students are used to a teacher directed approach, they may be reluctant to explore content or share their research. Learning to construct understanding with peers can be, at times, not easy to implement, especially in mixed ability groups. It would be difficult to use the CMSCE or similar program in an environment that is teacher directed.
The teacher in a socially constructivist environment must be prepared to relinquish some control of the learning process. This may be a great paradigm shift for some teachers, especially if teachers are used to teaching towards specific outcomes such as an exam. Research into scaffolding the social construction teaching and learning process for teachers and students should be explored for the CMSCE program to have a greater chance of success. Also, the teacher’s use of questioning enabled the students to use some metacognitive skills, such as self-regulated learning, to develop their understanding. To use this approach effectively, a teacher may have to develop his or her skills in terms of questioning and facilitation to ensure the students develop their knowledge through social interaction. In this study, the students spoke frequently with the teacher. The teacher was seen as a relative expert in the topics being researched. It may have also meant that students were trying to cater to the teacher’s wishes in developing a good assignment with a view to receiving a better mark. An examination of students in this environment without the support of a teacher (expert) or without being motivated by an assessable task may produce a different dynamic in the classroom.

Obviously, there are limitations in the transfer of this program to other settings because of the teaching and learning philosophy of the teacher. A teacher who does not use a socio-constructivist approach may be unable to create a social constructivist environment and use the CMSCE program successfully. This limitation needs to be considered for students as well, especially if they are accustomed to a teacher directed approach to learning.

Another limitation was the size of the class. Because the class was small, the students had an opportunity to get to know each other well and develop confidence in sharing their work with each other. Also, the small class made the workload on the teacher more manageable. A larger class might not have received the frequency or depth of feedback from the teacher. The size of the class may be a practical implication that might affect the effectiveness of the learning environment.
Finally, the students were at an advanced level of learning, being in Year 11. This environment may not have been as effective with a younger group of students who were less mature in terms of receiving feedback from their peers.

Technologies in education are constantly implemented in learning environments. Many have similar attributes to the CMSCE program, but they do not facilitate the same learning environment.

5.4 Conclusion

This study demonstrated the ways that the use of technology can assist in creating a learning environment that fosters social constructivism and allows students to develop a deep understanding of the content being taught.

The Computer Mediated Social Constructivist Environment (CMSCE) program created for this study, allowed an individual approach to teaching students with different learning rates. Also, it allowed the teacher to make the assignment specific to an individual; that is, the teacher managed the feedback to suit the individual’s learning ability and interest.

The participants involved in the project were motivated to learn. It was evident that students developed an in-depth knowledge of their content in a way that may have been difficult in a traditional classroom. The students exhibited an in-depth understanding of the content to accommodate the curriculum requirements, and had the curiosity to research further and to examine questions not required by the syllabus.

The students valued the feedback from the teacher and also found it useful to discuss work with their peers. A key advantage was the flexibility of the learning environment. Using the CMSCE program to submit a series of drafts of their work, enabled students and the teacher to engage in numerous discussions they perhaps would otherwise not be able to do. These discussions helped students collaborate during the lessons and outside of the classroom.
Collaborative learning through discussion increased the quantity of sources that the students drew information from compared with a teacher directed classroom environment. Collaboration also increased motivation and the level of understanding of the content because of the opportunity to share and express ideas with other people. Interest in the research was high and it proved to be a powerful intrinsic motivator which assisted students in understanding the principles of concepts and, consequently, students were able to develop theories which evolved from their research.

The CMSCE program assisted the process of collaboration and the negotiation of meaning helped to shape and define new knowledge and develop a deeper understanding of the content learnt. The program was an inextricable part of the classroom environment. Computer-mediated communication became a natural part of the learning process. On-going discussion and collaboration formed an intricate part of the classroom environment which added authenticity to the study. However, the effective use of technology in this study reflected the teacher’s pedagogical approach to teaching and learning as social constructivist process. Without this approach, then the environment may not have been conducive to collaborative learning.
REFERENCES


APPENDIX A - UNIT OUTLINE

2 Unit Personal Development, Health and Physical Education

Preliminary Core 1 - Meanings of Health and Physical Activity/Preliminary Core 2 – Better Health for Individuals

Module Length: 21 lessons – 75 minutes/lesson

Module Aim: Students will investigate the concepts of health and physical activity and explore how people’s views differ, according to their experiences and backgrounds.

To gain an understanding and value how personal actions, policy, environment, community action and health services can all interact to achieve better health for individuals.

Outcomes:
P1 Identifies and examines why people give different meanings to health and physical activity.
P2 Explains how nutrition, physical activity, drug use and relationships affect personal health
P3 Recognises that health is determined by sociocultural, economic and environment factors
P4 Identifies aspects of health over which individuals can exert some control
P5 Plans for and can implement actions that can support the health of others
P6 Proposes actions that can improve and maintain personal safety
P10 Plans for participation in physical activity to satisfy a range of individual needs
P11 Assesses and monitors physical fitness levels and physical activity patterns
P15 Forms opinions about health promoting actions based on a critical examination of relevant information
P16 Utilises a range of sources to draw conclusions about health and physical activity concepts

Lesson Outcomes Students Learn About Students Learn To Teaching/Learning Strategies Resources Registration

1 P1 What do people mean by health? Conceptualise health as a state of being that is:

- health as absence of disease
- health as a holistic concept
- dimensions of health (physical, spiritual, social, mental, emotional)

Critical examine questions such as:
- Is it possible to be physically active and not be healthy?
- Can you be healthy without being physically active?

Apply an understanding of the concept of ‘social construct’ to explanations of why people have different views of health and physical activity

- Teacher gives definitions of the meaning of health, what people mean by physical activity and how people view health socially and culturally.
- The teacher will explain on the social construct of health.

- WHO
- BHC Definition
- Newspaper Articles
- www.who.com
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Outcomes</th>
<th>Students Learn About</th>
<th>Students Learn To</th>
<th>Teaching/Learning Strategies</th>
<th>Resources</th>
<th>Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Physical Activity: NSW Health Promotion Survey 1994</td>
</tr>
<tr>
<td></td>
<td>P1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- How do people's views of health and physical activity vary according to their social, cultural, and economic backgrounds?
- Advantages of viewing health and physical activity as social construct
  - Supports principles of diversity and social justice
  - Recognizes the inter-relationship of many sociocultural and environmental factors on health

- Health and physical activity as social constructs
  - They change meanings over time
  - They mean different things from culture to culture, individual to individual, context to context

- Challenging the notion that health is solely an individual's responsibility

- Apply an understanding of the concept of 'social construct' to explanations of why people have different views of health and physical activity

- Students will be given the first assignment:
  - Individually, students examine an article and explain social constructivism in relation to health
  - In pairs, students will explain their view to their partner and they will write any co-constructed answers in red.

- Question approaches to health and physical activity that blame individuals and that attach all responsibility for poor health to them.
- Identify the meanings of health and explain why these may contrast with meanings other people hold.
- Explain the different roles physical activity plays in people's lives and identify the meanings they give to activity in their own lives.

- Understanding why not all people have equal opportunities to achieve and maintain high levels of health: understand that health can be achieved despite limitations.
- Students (in their pairs) will discuss a new article based on the government's action on a health related issue.
- The students will discuss the value of viewing health as a social construct. They will determine if the government views health as a social construct.
- Students will then get into groups of four to discuss their responses to the article.

- Physical Activity: NSW Health Promotion Survey 1994
- Newspaper articles
- Australia's Health pg. 12, 29, 31, 43, 45, 50
- The New Public Health pg 190-191
- Outcomes 1 Text
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Outcomes</th>
<th>Students Learn About</th>
<th>Students Learn To</th>
<th>Teaching/Learning Strategies</th>
<th>Resources</th>
<th>Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>P1</td>
<td>What meanings do you give to your own health and physical activity?</td>
<td>Identify the meanings of health and explain why these may contrast with meanings other people hold</td>
<td>Recap the first three lessons.</td>
<td>Newspaper articles</td>
<td>CMSCE</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>Personal meanings of health and physical activity</td>
<td>Explain the different roles physical activity plays in people’s lives and identify the meanings they give to activity in their own lives.</td>
<td>Ask students their view’s of the article and social constructivism and whether the government’s actions are appropriate.</td>
<td>Australia’s Health</td>
<td>Outcomes</td>
</tr>
<tr>
<td></td>
<td>P3</td>
<td>▪ Advantages of viewing health and physical activity as social construct</td>
<td>Understand why not all people have equal opportunities to achieve and maintain high levels of health: understand that health can be achieved despite limitations</td>
<td>Teacher plays devil’s advocate to create a metacognitive thinking environment.</td>
<td>Outcomes 1 Text</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P4</td>
<td>▪ Challenges the notion that health is solely an individual’s responsibility</td>
<td>Teacher also explains the value of a social constructivist learning process.</td>
<td></td>
<td>PDPHE Application and Inquiry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P5</td>
<td>▪ Identify the meanings of health and explain why these may contrast with meanings other people hold</td>
<td>▪ The next task is handed out and the assessment is explained:</td>
<td></td>
<td>CMSCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P6</td>
<td>▪ Range of personal meanings</td>
<td>▪ Marks are given for the process of thought and the evolution of thought in relation to the question they have to research.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10</td>
<td>▪ Relevance of meanings to others</td>
<td>▪ Students are shown how to log on to CMSCE and how to use it</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11</td>
<td>What meanings do you give to your own health and physical activity?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P15</td>
<td>Personal meanings of health and physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P16</td>
<td>▪ Range of personal meanings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Relevance of meanings to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-7</td>
<td>P1</td>
<td>How important is nutrition to your health?</td>
<td>Explain the patterns of health in relation to:</td>
<td>Teacher will give an overview of the all the topics for example:</td>
<td>Newspaper articles</td>
<td>Outcomes</td>
</tr>
<tr>
<td></td>
<td>P2</td>
<td>Analysing Dietary Choices</td>
<td>- Nutrition</td>
<td>Nutrition</td>
<td></td>
<td>Australia’s Health</td>
</tr>
<tr>
<td></td>
<td>P3</td>
<td>▪ Dietary needs of young people</td>
<td>- Physical Health</td>
<td>Physical Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P4</td>
<td>▪ Dietary Guidelines</td>
<td>- Drugs</td>
<td>Drugs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P5</td>
<td>▪ Nutrients</td>
<td>- Relationships</td>
<td>Relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ The relationship between diet, physical activity</td>
<td>Identify the health effects that result from a diet too high or too low in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson</td>
<td>Outcomes</td>
<td>Students Learn About</td>
<td>Students Learn To</td>
<td>Teaching/Learning Strategies</td>
<td>Resources</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>P6</td>
<td>and weight</td>
<td></td>
<td></td>
<td></td>
<td>1 Text</td>
<td></td>
</tr>
<tr>
<td>P10</td>
<td>Outcomes of nutrition on Health</td>
<td></td>
<td></td>
<td></td>
<td>• PSHPE Application and Inquiry</td>
<td></td>
</tr>
<tr>
<td>P11</td>
<td>Social, emotional and physical benefits of healthy eating</td>
<td></td>
<td></td>
<td></td>
<td>• CMSCE</td>
<td></td>
</tr>
<tr>
<td>P15</td>
<td>• Outcomes of healthy eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P16</td>
<td>Factors which affect patterns of eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Socioeconomic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sociocultural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass media</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lifestyle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to information and support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>How important is physical activity to your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analysing patterns of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levels of physical activity necessary for health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity needs and patterns of young people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Factors affecting involvement of young people in physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Benefits and outcomes of physical activity on health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Planning for increased levels of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify the purpose of physical activity to the individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identifying barriers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Range of physical activities available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Access to support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How does drug use affect your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nature and prevalence of drug use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>categories and types</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>patterns of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>levels of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reasons for use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• health enhancement, experimentation, habit, dependency, recreational use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>nutrients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does fitness equal health? Can physical activity be dangerous to health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Draw conclusions about the factors influencing participation in physical activity by interviewing a range of different people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Critically examine the amount of physical activity needed to incur health benefits by investigating:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How much physical activity is enough?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is this the same for all people?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Does fitness equal health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Draw conclusions about the factors influencing participation in physical activity by interviewing a range of different people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify the most commonly used drugs in the community and explore patterns of drug use (e.g. By age, gender and cultural factors)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop strategies for identifying the purposes currently served by use of a drug and social influences on people to use drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson</td>
<td>Outcomes</td>
<td>Students Learn About</td>
<td>Students Learn To</td>
<td>Teaching/Learning Strategies</td>
<td>Resources</td>
<td>Registration</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-------------------------------</td>
<td>-----------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Factors associated with harm from drug use</td>
<td>Recognise the effects of drugs on the individual may be unanticipated and interdependent.</td>
<td>Investigate strategies that will reduce risk to themselves and others.</td>
<td>Examine situations where drug use may occur and identify alternatives</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Effects of drugs on the individuals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Physical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Psychological/emotional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Social</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Legal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Factors associated with harm from drug use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Characteristics of the individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Potential for harm from the drug</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Influences on drug use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Responsible Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>What is responsible behaviour?</td>
<td>Recognise that the approach taken by the Ottawa charter is based on an understanding that health is socially determined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ways to reduce risk to self and others</td>
<td>Distinguish the difference between the 5 areas and give examples of each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternatives to drug use</td>
<td>Recognise that the approach taken by the Ottawa charter is based on an understanding that health is socially determined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E.g. Recreation, activity, stress management,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>What actions are needed for you to achieve and maintain the best possible health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Action Areas of the Ottawa Charter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developing Personal Skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creating Supportive Environments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strengthening Community Action</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reorienting Health Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building Public Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P1 How important is nutrition to your health? Analysing Dietary Choices

- Critically examine the influence of the factors which affect eating patterns in case studies

- Students will research their questions.

- Newspaper
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Outcomes</th>
<th>Students Learn About</th>
<th>Students Learn To</th>
<th>Teaching/Learning Strategies</th>
<th>Resources</th>
<th>Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-11</td>
<td>P2</td>
<td>Dietary needs of young people</td>
<td>The links between disordered eating and ideas of femininity and masculinity in the mass media</td>
<td>They will submit all their written work onto CMSCE and will answer any additional questions the teacher offers.</td>
<td>f articles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3</td>
<td>Dietary Guidelines</td>
<td>The rise of fast foods in our society</td>
<td>Students are able to work at school or at home</td>
<td>Australia’s Health</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P4</td>
<td>Nutrients</td>
<td></td>
<td>The teacher will examine the student’s work regularly and provide feedback, questions and suggestions for further research.</td>
<td>Outcomes 1 Text</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P5</td>
<td>The relationship between diet, physical activity and weight</td>
<td>Critically examine the amount of physical activity needed to incur health benefits by investigating: How much physical activity is enough Is it the same for all people</td>
<td>PDHPE Application and Inquiry</td>
<td>CMSCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P6</td>
<td>Outcomes of nutrition on Health</td>
<td>Explore the role of physical activity in the development of physical, social and emotional outcomes e.g. Reduced risk of certain diseases, increased self-esteem, broader social networks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10</td>
<td>Outcomes of nutrition on Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11</td>
<td>Social, emotional and physical benefits of healthy eating</td>
<td>Explore how the effects of drug use are influenced by the interaction between the drug, the individual and the environment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P15</td>
<td>Outcomes of healthy eating</td>
<td>Identify relationship changes, recognize the characteristics of successful relationships and apply this understanding to a discussion of the roles and responsibilities of people in different relationships</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P16</td>
<td>Factors which affect patterns of eating</td>
<td>Apply their knowledge to a government initiative in relation to the areas above.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Socioeconomic</td>
<td>Use the Action areas of the Ottawa Charter to manage health in a particular area.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sociocultural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mass media</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lifestyle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access to information and support</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>How important is physical activity to your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysing patterns of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Levels of physical activity necessary for health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activity needs and patterns of young people</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Factors affecting involvement of young people in physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Benefits and outcomes of physical activity on health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Planning for increased levels of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identify the purpose of physical activity to the individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identifying barriers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range of physical activities available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access to support</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>How does drug use affect your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nature and prevalence of drug use categories and types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>patterns of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>levels of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson</td>
<td>Outcomes</td>
<td>Students Learn About</td>
<td>Students Learn To</td>
<td>Teaching/Learning Strategies</td>
<td>Resources</td>
<td>Registration</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-----------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>Reasons for use</td>
<td>• health enhancement, experimentation, habit, dependency, recreational use</td>
<td>Factors associated with harm from drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factors associated with harm from drug use</td>
<td>• characteristics of the individual</td>
<td>Effects of drugs on the individuals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• potential for harm from the drug</td>
<td>• Physical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• influences on drug use</td>
<td>• Psychological/emotional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Economic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Legal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effects of drugs on the individuals</td>
<td></td>
<td>Factors associated with harm from drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Characteristics of the individual</td>
<td>Responsible Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Potential for harm from the drug</td>
<td>• What is responsible behaviour?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Influences on drug use</td>
<td>• Ways to reduce risk to self and others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alternatives to drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• E.g. Recreation, activity, stress management,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alternatives to drug use</td>
<td></td>
<td>Action Areas of the Ottawa Charter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Developing Personal Skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Creating Supportive Environments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Strengthening Community Action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reorienting Health Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Building Public Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson</td>
<td>Outcomes</td>
<td>Students Learn About</td>
<td>Students Learn To</td>
<td>Teaching/Learning Strategies</td>
<td>Resources</td>
<td>Registration</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-------------------------------</td>
<td>-----------</td>
<td>--------------</td>
</tr>
<tr>
<td>12 P1</td>
<td>As Above</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2 P3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P4 P5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P6 P10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P11 P15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Critically examine the influence of the factors which affect eating patterns in case studies</td>
<td>Students will provide a 10 minute presentation of their work so far.</td>
<td>• Students will research their questions.</td>
<td>• Newspaper articles</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The links between disordered eating and ideals of femininity and masculinity in the mass media</td>
<td>• They will answer any questions from other students and the teacher</td>
<td>• They will submit all their written work.</td>
<td>• Australia’s Health</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The rise of fast foods in our society</td>
<td>• They will then continue with their research</td>
<td></td>
<td>• Outcomes 1 Text</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Critically examine the amount of physical activity needed to incur health benefits by investigating:</td>
<td></td>
<td></td>
<td>• PDHPE Application and Inquiry</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>How much physical activity is enough</td>
<td></td>
<td></td>
<td>• CMSCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Is it the same for all people</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explore the role of physical activity in the development of physical, social and emotional outcomes e.g. Reduced risk of certain diseases, increased self-esteem, broader social networks.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explore how the effects of drug use are influenced by the interaction between the drug, the individual and the environment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identify relationship changes, recognize the characteristics of successful relationships and apply this understanding to a discussion of the roles and responsibilities of people in different relationships</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply their knowledge to a government initiative in relation to the areas above.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use the Action areas of the Ottawa Charter to manage health in a particular area.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>How important is nutrition to your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-18</td>
<td>P1 P2 P3</td>
<td>Analysing Dietary Choices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Critically examine the influence of the factors which affect eating patterns in case studies</td>
<td>Students will research their questions.</td>
<td>• Students will research their questions.</td>
<td>• Newspaper articles</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The links between disordered eating and ideals of</td>
<td></td>
<td></td>
<td>• Australia’s Health</td>
<td></td>
</tr>
<tr>
<td>Lesson</td>
<td>Outcomes</td>
<td>Students Learn About</td>
<td>Students Learn To</td>
<td>Teaching/Learning Strategies</td>
<td>Resources</td>
<td>Registration</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-----------</td>
<td>--------------</td>
</tr>
<tr>
<td>P4</td>
<td></td>
<td>• Dietary needs of young people</td>
<td>• Students Learn To</td>
<td>work onto CMSCE and will answer any additional questions the teacher offers.</td>
<td>s Health</td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td></td>
<td>• Dietary Guidelines</td>
<td></td>
<td>• Students are able to work at school or at home</td>
<td>• Outcomes</td>
<td></td>
</tr>
<tr>
<td>P6</td>
<td></td>
<td>• Nutrients</td>
<td></td>
<td>• The rise of fast foods in our society</td>
<td>1 Text</td>
<td></td>
</tr>
<tr>
<td>P10</td>
<td></td>
<td>• The relationship between diet, physical activity and weight</td>
<td>• Outcomes of healthy eating</td>
<td>How much physical activity is enough</td>
<td>• PDHPE Application and Inquiry</td>
<td></td>
</tr>
<tr>
<td>P11</td>
<td></td>
<td></td>
<td></td>
<td>Is it the same for all people</td>
<td>• CMSCE</td>
<td></td>
</tr>
<tr>
<td>P15</td>
<td>Outcomes of nutrition on Health</td>
<td></td>
<td></td>
<td>Explore the role of physical activity in the development of physical, social and emotional outcomes e.g. Reduced risk of certain diseases, increased self-esteem, broader social networks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P16</td>
<td>Social, emotional and physical benefits of healthy eating</td>
<td>• Outcomes of healthy eating</td>
<td></td>
<td>Explore how the effects of drug use are influenced by the interaction between the drug, the individual and the environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factors which affect patterns of eating</td>
<td></td>
<td></td>
<td>Identify relationship changes, recognize the characteristics of successful relationships and apply this understanding to a discussion of the roles and responsibilities of people in different relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Socioeconomic</td>
<td></td>
<td></td>
<td>Apply their knowledge to a government initiative in relation to the areas above.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sociocultural</td>
<td></td>
<td></td>
<td>Use the Action areas of the Ottawa Charter to manage health in a particular area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass media</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lifestyle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to information and support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>How important is physical activity to your health?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Analysing patterns of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Levels of physical activity necessary for health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity needs and patterns of young people</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Factors affecting involvement of young people in physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Benefits and outcomes of physical activity on health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Planning for increased levels of physical activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify the purpose of physical activity to the individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identifying barriers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Range of physical activities available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Access to support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How does drug use affect your health?</td>
<td>Nature and prevalence of drug use categories and types</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>patterns of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>levels of use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason(s) for use</td>
<td>Students Learn About</td>
<td>Students Learn To</td>
<td>Teaching/Learning Strategies</td>
<td>Resources</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-----------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Reasons for use</td>
<td>health enhancement, experimentation, habit, dependency, recreational use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factors associated with harm from drug use</td>
<td>characteristics of the individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>potential for harm from the drug</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>influences on drug use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Factors associated with harm from drug use

- Characteristics of the individual
- Potential for harm from the drug
- Influences on drug use

Effects of drugs on the individuals

- Physical
- Psychological/emotional
- Social
- Economic
- Legal

Factors associated with harm from drug use

- Characteristics of the individual
- Potential for harm from the drug
- Influences on drug use

Responsible Use

- What is responsible behaviour?
- Ways to reduce risk to self and others

Alternatives to drug use

- E.g. Recreation, activity, stress management,
- The right to choose
- The need for consent
- Rights and responsibilities
- Safe behaviours

What actions are needed for you to achieve and maintain
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Outcomes</th>
<th>Students Learn About</th>
<th>Students Learn To</th>
<th>Teaching/Learning Strategies</th>
<th>Resources</th>
<th>Registration</th>
</tr>
</thead>
</table>
| 19-21  | As Above | - the best possible health?  
  Action Areas of the Ottawa Charter  
  - Developing Personal Skills  
  - Creating Supportive Environments  
  - Strengthening Community Action  
  - Reorienting Health Services  
  - Building Public Policy | - Critically examine the influence of the factors which affect eating patterns in case studies  
  - The links between disordered eating and ideals of femininity and masculinity in the mass media  
  - The rise of fast foods in our society  
  - Critically examine the amount of physical activity needed to incur health benefits by investigating:  
  - How much physical activity is enough  
  - Is it the same for all people  
  - Explore the role of physical activity in the development of physical, social and emotional outcomes e.g. Reduced risk of certain diseases, increased self-esteem, broader social networks.  
  - Explore how the effects of drug use are influenced by the interaction between the drug, the individual and the environment.  
  - Identify relationship changes, recognize the characteristics of successful relationships and apply this understanding to a discussion of the roles and responsibilities of people in different relationships  
  - Apply their knowledge to a government initiative in relation to the areas above.  
  - Use the Action areas of the Ottawa Charter to manage health in a particular area. | - With their partners, students will visit another group’s page.  
  - They will answer questions on the validity of the group’s response and critically analyse their work.  
  - They will provide feedback to another group on CMSCE | - Newspaper articles  
  - Australia’s Health  
  - Outcomes  
  - PDHPE Application and Inquiry  
  - CMSCE |
<table>
<thead>
<tr>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal</td>
</tr>
<tr>
<td>Formal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date Started: __________________________</th>
<th>Date Completed: __________________________</th>
<th>Number of Lessons: __________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Teacher’s Signature: __________________________</th>
<th>Coordinator’s Signature: __________________________</th>
</tr>
</thead>
</table>

Evaluation:

What worked well?

Suggestions for improvements
This task is will be 15% of your assessment.

Task
This task will be done on a program called CMSCE (Computer-mediated Social Constructive Environment).

To Log on to this program, go to:
http://timov.educ.uow.edu.au/cgi-bin/WebObjects/cmsce

You will be asked to create a new page. This will be your page for the duration of this task. When you Log on in future, DO NOT create a new page, find the one you have created. It will have all your information already saved.

Part A:
You will receive several research questions. In pairs, you will have the opportunity to choose ONE of the questions provided (see below), or negotiate a question with the teacher.

Questions:
1. 
   (a) Critically examine the amount of physical activity needed to incur health benefits by investigating”
   - How much physical activity is enough?
   - Is this the same for all people?
   - Does fitness equal health?
   - Can physical activity be dangerous to health?
   (b) Explore the role of physical activity in the development of physical, social and emotional outcomes, e.g. reduced risk of certain diseases, increased self-esteem, and broader social networks.
   (c) Draw conclusions about the factors influencing participation in physical activity.

---------------------------------------------------------------------------------------------------------
2.
   (a) Identify the health effects that result from a diet too high or too low in nutrients and explain how this can affect the individual (physically, emotionally, socially) and the community.
   (b) Critically examine the influences of the factors which affect eating patterns in situations such as:
       - the links between disordered eating and ideals of femininity and masculinity in the mass media.
       - the rise of fast foods in society
       - people who live in socio-disadvantaged areas.

3.
   (a) Identify the most commonly used drugs in the community and explore patterns of drug use (e.g. by age, gender and cultural factors)
   (b) Investigate government strategies that have been implemented to reduce the harm of drugs on an individual and society.
   (c) Examine alternatives to the government strategies and detail the positives and negatives.

Part B:
After choosing a question, Log on to CMSCE and type your question in.

Use the library or the Internet to research your question. It is a good idea to divide the work between you, so that each person has a job throughout the task.

Each person should write the information on their page and you should check the teacher’s and visitor’s questions/ comments at the beginning of each lesson.

You need to address all the teacher’s questions before you have completed the task. The questions are designed to extend you and help you understand the concepts of Core 2.
APPENDIX C
EXAMPLE OF AN ORAL TRANSCRIPT OF TWO STUDENTS (JENNY & ANN)

17Feb2
Jenny and Ann

TEACHER – I would like you to talk about your assignments to your partner.
JENNY - Can I do some work at home?
TEACHER - …yes. You can access this anywhere you have the Internet

20Feb2
JENNY - This article has patterns of use for alcohol and drugs. We can write this down and then we can focus on one drug.
ANN -I think we should focus on alcohol use
JENNY -Yes
ANN – Because alcohol is more abused. Think about your friends alcohol is more abused rather than ecstasy or speed.
JENNY -Yes that’s true. Well if you want to look at patterns, then I will look further into alcohol abuse.
ANN - There is such a strong stereotype. Alcohol is the most abused drug and people don’t see it as a drug
JENNY -We should examine the main abuses of alcohol – teenagers
ANN - yes 14 – 21
JENNY - …and look at the way the government is addressing the abuse of alcohol.
ANN - …and I think there was a government forum about upping the legal age to 21, but we can look at the problems that might be associated with it as well.
JENNY - … because if the legal age was 16 then people wouldn’t abuse it, but because they aren’t supposed to drink it, it becomes cool and rebellious.
ANN - I’m over alcohol already
JENNY - this is a good website. This is the stuff that I found on teenage drug use. Do you want to focus on alcohol or drugs in general?
ANN -at the moment I am writing the 3 groups of drugs – stimulants, depressants, hallucinogens then I will move into alcohol and move into illicit drugs
JENNY - I might focus on alcohol

... 

JENNY - I have an idea. Ann, why don’t you do (A) and I will do (B)?
ANN - Look for patterns on gender, age?
JENNY – Yeah, but examine it a bit more deeply. Mr Stoj I don’t know where to go with this.
TEACHER - we can focus on the biggest causes of death – Alcohol. It doesn’t just involve drink driving, but cardiovascular disease and diabetes amongst others.
JENNY - Ann has got some stuff on drugs in general.
TEACHER - how about you look at government initiative in reducing harm from alcohol. You have already mentioned that you were going to examine it.
JENNY - I already looked at this site. How about Alcohol national strategy plan.
TEACHER – Yeah. They have new commercials out. You will find new laws; i.e. legal limit for drivers on provisional licences. Lolly drinks are not advertised any more, etc.
LISA - Really I don’t drink since my friend had a bad experience.
TEACHER - Really. There are commercials that target different age groups, social status, etc.

22Feb2

ANN - What has Mr Stoj asked you to focus on?
JENNY - Alcohol and the government initiative and campaigns
ANN - Have you found much information?
JENNY - Yeah Mr Stoj helped me. What is your focus?
ANN - I’m doing ecstasy

... 

TEACHER - you will find the government initiative follows a plan – the Ottawa Charter. Use this to examine the campaign against the Ottawa Charter.
Developing Personal skills is teaching people make educated choices and help themselves.
JENNY - So education in schools?
TEACHER - Yes. Reorienting Health services is professional people going into schools or the work place and educating people on preventative measures.

JENNY - Police and stuff

TEACHER - Yes going into schools educating people on not drinking and driving. Strengthening Community Action the government supporting the community in carrying out the government’s initiative.

JENNY - ok. Is that like pubs? The initiative where the designated driver gets free soft drinks all night?

TEACHER – Yes. Excellent. Creating supportive environments is the government creating an environment that is conducive to the initiative. It gives people the opportunity to lead a healthier life.

JENNY - ok.

TEACHER - Building healthy public policy is laws.

JENNY - Like don’t drink and drive

TEACHER - Yes. I want you to examine Australia’s Alcohol Campaign against the Ottawa Charter. What does the government do that is compliant with the Ottawa Charter? Give examples. If you can do this well, you are doing HSC standard work.

…

JENNY - Ann, do you have the website you got that from? I think it had stuff related to strengthening community action.

ANN - What’s that?

JENNY - A framework to reduce the risk of alcohol related trauma.

ANN - I’ll send it to you

23Feb2

TEACHER - In about 5 lessons I want you all to explain to the rest of your group your research. So be prepared to talk and answer q . Know your topic.

…

ANN - Can I use tables to answer this q?

TEACHER - tables will not work in this program

TEACHER - What have you found?

ANN - Patterns of drug use – I’m also concentrating on ecstasy. It will be easier to present heaps of information in tables.

TEACHER - Sorry – give me an overview.
27Feb2
TEACHER- how are you going Ann?
ANN -Good. I’m researching ecstasy. Isn’t ecstasy and speed the same thing?
TEACHER - No. Speed is an amphetamine and it excites and stimulates the nervous system. Ecstasy does different things to the body. It reduces your inhibitions it gives you energy for the night. It gives a psychological high.
…
ANN – Jenny. I looked at your work and looks really good. Does the Ottawa Charter just apply to alcohol?
JENNY -No. Mr Stoj said that it was designed for any problem.
…
TEACHER - Jenny how are you going with your research?
JENNY - Good. I have stuff on my site now. I had too read it over again to make sure the National Campaign used the Ottawa Charter effectively.
TEACHER - Good. I will read it today and make sure you are on track.
JENNY - Thanks

1Mar2
JENNY - I have read so much of this information that I am ready to run for parliament
…
TEACHER - Did you read the tips I gave you Jenny?
JENNY -Yeah. You said I was on track with Developing Personal Skills. Can I finish this one and get you to look at Reorienting Health Services when I have finished.
TEACHER - Yes
…
ANN -Am I on the right track with my analyses of ecstasy and the UK government’s efforts compared to Australia.
TEACHER - your explanation is excellent. You will notice that I have said that there is a contradiction in the government approach in South Australia and their approach to the injecting rooms.
ANN -Yeah. I found a political debate saying that and I was going to include it.
TEACHER - Good. Tell me what you think as well. You have read and written enough to understand the topic very well

3Mar2
TEACHER – Ann. How are you going with the ecstasy debate?
ANN -Good. The problem is that it’s a fine line between helping people and encouraging the use of drugs
TEACHER - In the UK they have people who will test your drug to ensure it’s pure – similar to the kit in South Australia
ANN -Yeah. I think I came across that in my reading about reducing the harm of ecstasy.

…
TEACHER - Jenny do you understand my comments? I think you confused some Strengthening Community Action examples with Building Healthy Public Policy.
JENNY -Yes I understand. Basically Building Healthy Public Policy is the laws that are made to control behaviour, like drink driving.
TEACHER – Yes. Very good

7Mar2
TEACHER – Jenny. Some of your examples can be used across different action areas. Some things can be used in both Creating Supportive environments and Strengthening Community Action. It depends how you explain it.
JENNY -Ok.
TEACHER - Ann, I have given you an extra question. You are heading in that direction anyway, so continue in that vein.
ANN -I have looked at some of the debates relating to the eradication of deaths related to ecstasy.
TEACHER – Yeah. I just want to know a little more about that. Include your opinion.

…
ANN -I can’t get into the ecstasy site because access has been denied.
TEACHER - The site that I gave you?
ANN -Yes
TEACHER - The school may have blocked it. I found these sites at home. You may need to access it at home.
ANN - ok

TEACHER- One thing may be of interest. In South Australia, they have people testing pills to make sure the pill is safe and then give it back to you. The South Australian government is unhappy, but the Federal government is funding injecting rooms.

MANDY – do you know that many over the counter drugs in the chemist have to be signed and logged onto a computer because they are making amphetamines and stuff from a combination of drugs.

TEACHER - That’s true.

…

JENNY -What is Reorienting Health services?

TEACHER - professionals going into the school or workplace educating about preventative measures

JENNY -Like police going to schools educating about drink driving?

TEACHER - yes

JENNY -with strengthening community action, is that the community creating safer environments and stuff

TEACHER - Yes

JENNY -Is an example of that an initiative where the pub owners give free soft drinks to designated drivers?

TEACHER – Yes. Excellent example.

…

ANN -In the UK they are recommending drug kits to students where you can test your own drugs, but the government is not happy.

TEACHER - Really.

9Mar2

TEACHER - What are you researching Ann?

ANN -I started off by looking at drugs in general and then started examining ecstasy and the problems that arise all over the world. I examined some government initiatives in Australia and the UK. Teenagers are abusing it. They are taking more ecstasy tablets despite there being no addictive substances in the drug. Instead they are addicted to the euphoria. Because it is associated with Raves and the party scene, it is sold to teenagers and it has contaminants that cause teenagers problems. So
organizations are setting up testing stations at parties where users can get their tablets tested. They way they do that, get a tupper ware lid and scrap off some of the tablet. Add a reactant substance and you have a colour chart. For pure ecstasy it goes black. If it contains speed it turns orange, if it turns lime green its 2CS. Impure ecstasy may also contain codeine and other impurities that can kill you.

MARY - How do people die?
ANN - They die from their environment. They drown themselves by drinking too much water and they dilute salt in the blood stream, they overheat, they exhaust themselves. It last for 6 hours and it makes you forget all you problems, and then when you come off the high you get depressed and become suicidal.

TEACHER - Any questions?
SARA – What countries have testing?
ANN - UK have the test and in Australia in South Australia, but there is political debate.

15Mar2
JENNY - Mr Stoj, can you please tell me where I’m sitting at the moment. I’ve examined the Australian national Health Strategy and its use of the Ottawa Charter. I think I have proposed some strategies that can be achieved, but can you let me know what you think.

TEACHER - This is excellent. I think you have just about finished. I will give you the final task so you can prepare it for next lesson.
ANN - Can I start task 3 as well?
TEACHER - Yes you two can do it as a pair.
17/02/2006

**Observation of Social Constructivism (OSC)**

After an explanation of task 2, the students started discussing the questions that they were going to negotiate or choose. Group 4 were deep in conversation about the method and topic they would undertake. Obesity and Australia's problem with obesity provided avid discussion. Campaigns from the government created discussion amongst other groups and generated ideas and understanding from other members.

Group 1 followed on from group 4's conversation and analysed campaigns that the government has introduced to reduce the risk of obesity.

Both groups searched the websites and discussed the information observed in relation to the question.

Group 3 found it difficult to focus on the question and often strayed in their thoughts and conversation. Whilst they sometimes dragged other groups into the 'off topic' conversation, the other groups managed to stay on task for the majority of the class. Group 2 discussed the different questions in depth. They decided on a topic that was mutually of interest and mapped out a plan of action to answer the question. They divided some tasks and searched the internet separately for the remainder of the lesson.

The social construct of knowledge occurred in earnest amongst members of groups and occasionally members of different groups. A consequence of the discussion was a collation of ideas and understanding. Some students discussed their questions with me and asked advice on an angle they could approach.

Most of the conversation between the students was from current perspective of visual programs. However, a student from group 3 and one from group 4 had slightly more knowledge of the government initiative. One student is an avid reader of the
newspaper and the other watched a current affair program detailing the government’s initiative. This insight gave the group an advantage in understanding the procedure of the government in delivering initiatives and what considerations need to be taken into consideration before campaigns can be delivered to the public.

**Observation of CMSCE Program (OCP)**

Showing the students how to access the program was relatively easy. All students managed to follow the instructions well and all groups were working within 10 minutes of the beginning of the lesson. It worked well. All students had simultaneous access without the program dropping out. Students often left their computers for long periods of time without the computer timing out.

The problems associated with the pilot seem to have been resolved.

20/2/2006

**OSC**

Students spoke in depth about their progress to their partners and to me. More focus questions and areas of research resulted.

Group 1 examined a lot of information in relation to exercise and health. Some of the information had implicit overtones detailing how physical activity contributed to health on several fronts including social, cognitive and psychological. In class, I talked to one of the students (Lisa) in relation to social health and physical activity. We discussed the importance that organised sport had on social well-being and self confidence. As a result, some of her work (extra) will focus on the health attributes of physical activity.

Group 2 investigated government initiatives in relation to tobacco strategies. (Jenny) talked to her partner and the teacher about the strategies the government should focus on. Who is important and why? After initial discussions, the developing national strategy to reduce tobacco harm was examined.

Group 3 researched eating disorders and the possible influences. (Hillary) questioned anorexia as a disease rather than a disorder and whether it would be appropriate to
examine case studies. (Hillary) also would like to focus on sport, particularly rhythmic gymnastics in which she is a part so she can synthesise her assignment into her interest.

Group 4 focused on obesity. (Mandy) noticed the frequency of fast food ads on TV compared to the health food ads. She also discussed with me the other contributors to obesity (not enough time to prepare for food these days, convenience, lack of education) and in particular, childhood obesity. (Mandy) believes that a focus on the media's influence could unravel some of the reasons for a growing epidemic of obesity in Australia.

**OCP**

One of the SAVE buttons doesn't work. This caused 2 students to lose a small amount of work.

22/02/2006

**OSC**

Many of the students have noticeably focused on particular areas of the research question, in particular, Mandy, Ann, Jenny, Sara and Hillary. As a result, I have extended these students and asked them to explore their interest (as long as it was on topic). The students were noticeably enthusiastic about their amended tasks.

More discussion and peer learning occurred because of the questions being administered and the students asked some profound questions to the teacher and made some insightful statements. One student (Diane) seems to struggle with the extra questions. Most of her information is based on personal opinion. Perhaps some research skills need to be taught.

One particular aspect of this lesson that was enjoyable from a teacher's perspective was the time and opportunity I had with 2 of the students. I was able to teach Jenny about the National Alcohol Strategy in relation to the Ottawa Charter. I was also able to talk to Mandy regarding the Canadian approach to obesity and she was able to draw links to Australia's parallel approach.
This lesson has been the most productive lesson thus far.

**OCP**

Similar to the last lesson

23/02/2006

**OSC**

This lesson enabled more construction between teacher and student. While students continued working on their individual questions, I had the opportunity to converse with a few students who were keen to explain their research findings and their constructed thoughts that resulted from their research.

In particular, Ann enjoyed a government forum which detailed the reasons an ecstasy initiative and the reasons it should be established. Mandy also talked about a Canadian offensive on obesity. She was particularly interested in the way that the Canadian government socially constructed a series of solutions aimed at targeting the whole Canadian population. That is, they asked the advice of various minority groups about the best way to reduce the onset of diabetes. Mandy enjoyed the reading and continued to apply it to the Australian government's parallel strategy.

Diane still struggled with research. I discussed an angle that she might take up to tackle her question. It revolved around the marketing of fast foods to children. She seemed interested in the discussion, but found it difficult to work alone. This type of work is foreign to Diane. Mandy, however, did assist Diane in recommending some books that Mandy stumbled across while doing her own research. This was an excellent example of social construct between students.

Hillary, her partner found it more enjoyable to focus on gymnasts with eating disorders. In fact, she extended her research to include current beliefs that anorexia is not merely a psychological disorder, but people with eating disorders have a particular gene that may be triggered and subject them to extremes of eating/not eating.

**OCP**
One student left her computer for 30 minutes. Her monitor timed out, but this might be due to the computer sleeping. She lost a small amount of work

27/02/2006
OSC
In this lesson I talked to a few students about their progression. Amy started to work on Medicare. Mary found it difficult to start.

Hillary vocalised her opinion relating to the website she was researching on sports and anorexia. She said that the director of gymnastics emphasised that he had no knowledge of eating disorders in the sport, but Hillary claimed she had other evidence that he was indirectly responsible and she intended to prove it.

Jenny said she was starting to get the hang of the application of the Ottawa Charter and she was developing a solid understanding of the advantages of applying the principles of the Ottawa Charter.

Ann said she could start seeing social construction in, not just her research, but her other work as well (English).

I told all the students that they would present an update on their research in two weeks.

OCP
No problems with CMSCE

1/03/2006
OSC
The students in this lesson worked in relative silence. This might be reflected in the recordings. By now, all students have their own specialist questions that they need to work on in conjunction with their work as a group. It was a good opportunity to talk to four students individually, and I had an opportunity to talk to the class about one of the students focus questions.
The first individual I talked to was Diane. She is still struggling to do more than identify facts about the question. She will need to learn about phrases such as critically analyse, evaluate and assess if she is to answer HSC questions well. In this lesson I tried to help her identify these words and address them. This program is giving me the opportunity to assess deficiencies in students work, understanding and the application of knowledge.

Jenny has an excellent grasp of the question, her knowledge and how to apply her knowledge. She is excelling in her application of the Ottawa Charter to the government’s efforts to reduce the risk of alcohol. This program is giving me the opportunity to manage a diverse range of student's abilities. I am able to help Diane and extend Jenny in the same class. This differentiation of work is a major positive in using this program.

Ann asked me to look at her work. Her review of ecstasy and a political debate is excellent. She understands the reason why a social constructive environment is necessary in designing an initiative to reduce the harm of ecstasy. Many groups and people with differing social circumstances suffer from the threat of ecstasy. Ann believes it is prudent that all groups concerns and ideas be addressed so that the majority of Australians are assisted in this strategy.

Mandy has delivered some excellent work in relation to the Canadian's initiatives on obesity. She has discovered that the Canadians have found it necessary to address people of differing circumstances and that the Government needs to provide an environment that gives the people the opportunity to lead healthier lives. Mandy and Ann discussed their similar views of social construction of knowledge in developing a National Strategy in relation to healthy living.

Hillary has provided an outstanding synopsis on eating disorders and the gymnasts. After discussing the situation with her, I asked her about the ideal somatotype of a gymnast. Jenny (also a gymnast) talked about how the government tested students in primary school and suggested to each student what sport they should be pursuing because of their somatotype. This discussion helped Hillary work on her answer for
the next section. Other students involve themselves in the discussion and made suggestions of body types for different sports.

**OCP**

No major problems. A computer may have caused some angst when saving work, but the CMSCE works well.

3/03/2006

**OSC**

This lesson included more incidental group discussion. Sara explained the reasons why exercise will benefit thinking and I asked her if there was any scientific reason. Mandy suggested a particular website that she came across in her studies. Mandy then told the group about her findings of the Canadian obesity offensive and how her work has expanded to Asia and America.

Ann discussed her findings on the addictive influences of ecstasy. She explained that she was struggling to find an accessible government initiative. The social construction of ideas is coming together each lesson and this lesson proved to be most effective. Some students requested more challenging questions.

**OCP**

No problems

7/03/2006

**OSC**

Prior to this lesson, I viewed each person's website to view their work. Most students are developing a sound knowledge of their work and have extended their research well beyond the original question.

For several of the students I have provided one last question prior to the end of this task. Ann will work on harm minimisation of ecstasy by several government organisations, Diane will work on schools contributing to a healthy outcome by selling healthy foods, and Sara will focus on scientific research that supports healthy eating links with academic excellence. Jenny needed help in understanding two
sections of the Ottawa Charter, but after reading my comments explained the areas to me with excellent understanding.

In the lesson I extended Mary's question to focus on the socioeconomic disadvantaged people's plight against obesity. I have asked her to talk to Mandy who is working on work of a similar nature.

In this lesson, I talked to the class about other people's work and what they have found. Many of the students contributed to the discussion and the group socially constructed ideas such as, the government’s double standard with ecstasy and the injecting rooms, the government’s application of the Ottawa Charter for various lifestyle diseases and evidence that schools all over the world link healthy eating and exercise to academic performance. This was a very productive social constructive lesson.

**OCP**

Worked well

8/03/2006

**OSC**

This lesson provided a lot of conversation relating to Mandy's work on several countries' efforts to reduce the risk of obesity. A few other students (Jenny and Amy) were able to provide feedback on information they have come across in their research and outside their research. Amy talked about the difference in Medicare and Private Health Insurance. Her research has taken her to a few websites, such as Medibank private, HCF, etc.

**OCP**

Worked well

9/03/2006

**OSC**
In this lesson, all students had an opportunity to present their findings and research to the class. We all sat around the table and each student verbalised their research, while the rest of the class listened and asked questions.

Diane presented first. Her study relating to the marketing of fast foods proved interesting. Diane suggested that companies, such as McDonald's, target children with toys and playgrounds an added bonus. They also targeted people of low SES status with the promise of convenience. Diane's second part of research questioned why people of low SES status purchased fast food more than the rest of the population. Amy also queried this statement, but (although in the early stages of the research) Diane suggested aspects of education (knowledge of CVD, obesity and diabetes and causes were unknown), employment (both parents work long hours and have little time to prepare a healthy meal), economic situation (affordability of healthy alternatives), location (more fast food restaurants in low SES areas). Diane spoke well, but needed more depth in her knowledge. She still is uncertain about several key issues in regards to her question. Rather than more questions, I believe Diane needs be questioned about her understanding.

Hillary first talked about eating disorders and sport. She highlighted the fact that a coach suggested he was not responsible for eating disorders, but in a separate article was accused of telling an athlete that they could not lift themselves over the bar because they were overweight. Jenny (a gymnast) agreed that the sport encourages and almost forces many athletes to adopt eating disorders. The fact that athletes are judged subjectively makes the situation worse. Although, (Hillary suggests) that a study suggests that appearance has no bearing on the score). Hillary then talked about the second part of her research, which included somatotype of gymnasts and other athletes. She suggested that gymnasts need to be ectomorph and mesomorph (favouring mesomorph). Hillary explained these terms aptly with Jenny's help and other students made some accurate suggestions for other athletes based on the explanation. Hillary has displayed excellent knowledge and understanding. Her research is thorough and she has the ability to propose answers and more questions from her research.
Mary highlighted the problems for an individual relating to obesity. She then continued to talk about a case study of an obese individual and why they chose to lose weight. The explanation was loose and not very informative. Mary, it seems, has done minimal research and has yet to develop an in depth knowledge of the topic. Her next question asks her to suggest why people of low SES suffer from obesity more than the rest of the population. Because Mary finds it difficult to learn and express her understanding, she may need a modified question, or a scaffolding of research and understanding procedure.

Jenny then presented her knowledge and application of Australia's drug offensive in conjunction with the Ottawa Charter. In complete contrast to Mary's effort, Jenny understands the Ottawa charter's principles and application. She was able to apply the Charter to several different problems (evident in her explanation). Several students (Mandy and Ann) related their topic to the Ottawa Charter and they were convinced that perhaps the government's actions towards the problems they were studying were based on the Ottawa Charter. Jenny's comprehensive knowledge shows that she has adapted to this type of learning exceptionally well.

Lisa was the final person to talk in this lesson. Her research involved her initial question of physical activity and what was required to stay healthy. She then continued to talk about whether too much activity could be unhealthy and finally told us that her third and final task was to find 2 case studies of athletes who played/trained through pain to the detriment of their own health. She will use Jenny as one of her studies. This prompted some of the students to tell of stories they had heard about similar situations.

Lisa is very thorough in her research. She understands the topic and knows how to find relevant information. In order to extend her, I think I need to ask her to apply her knowledge in a new situation. This form of synthesis is a relatively high form of thinking.

13/03/2006

OSC
Sara spoke first and explained that her research started with how exercise helps with academics and other aspects of everyday living. She explained about the holistic nature of health without real depth of knowledge.

After asking about the scientific reasons for academic improvement while playing sport, Sara went on to say that she doesn’t understand the information. After talking with Sara personally, Sara admitted that she hasn’t put enough research into this section and will provide a more comprehensive explanation in the next week. An explanation of a few key points and presentation may have assisted her collation of work.

Ann reviewed ecstasy, the problems associated with ecstasy and some solutions provided by various governments. Her analysis was comprehensive and she provided some debate (by government) on whether self drug testing kits should be sold to people. She also linked it to the injecting room’s scheme and proposed inconsistencies by govt. officials in delivering strategies to reduce harm from drugs. Ann answered many difficult questions with aplomb. Her ability to know the topic and her interest in the topic is evident and she easily engaged the other students in the rooms. As a result, her work provides animated discussion and deep thought from the class.

Amy talked about Medicare and the govt. use of Medicare to reduce the problems associated with obesity. She explained the benefits of Medicare to the Australian people, but the burden it places on the government She then explained ways the govt. is trying to alleviate the pressure (through introducing private health Insurance and other benefits). Amy researched some excellent information, but applied her knowledge minimally so far. A further question that asks some synthesis of information will determine her in depth understanding.

Mandy provided a comprehensive look at the govt. around the world - efforts to reduce obesity. She explained that the targeting of a younger generation is prudent and that strategies are conducted social constructively around a round table. This has proved beneficial in countries such as Canada and the UK. Mandy now needs to apply her knowledge to a government initiative with recommendations based on research.
15/03/2006

OSC

This lesson confirmed the impending finish of task 2.

I asked all students to talk to me about how they feel they are going after I gave each student personal advice on how they should complete task 2. Several students approached me regarding questions they had on the last part of task 2. Amy and I talked about Medicare and the government's attempt to lure people to private health insurance. After a lengthy talk, she realised the importance of sharing the health monetary burden for Australia's sake and consequently knew which direction she would take to answer the last question. Amy developed a greater understanding through her discussion as we build on her segmented knowledge. She pieced much of it together as she discussed some of her research.

Jenny looked at the last section of the Ottawa Charter. She asked me if the laws and legislations relating to driving, that have recently been implemented, have been a result of the government's initiative to reduce alcohol related accidents. We also discussed some of the other laws the government has introduced to reduce the risk of harm from alcohol.

Jenny grasp of the Ottawa Charter makes for some interesting conversation. Many initiatives she has discovered are new and her suggested proposals are insightful. This is social constructivism at its best.

Mary asked if she was on track. She approached her last modified question with a little more intent. She is yet to develop the higher order thinking skills of some of the other students. This could be a result of interest or limited opportunity in the past. The last question has been modified to suit her stage in learning.

Ann has an excellent knowledge of ecstasy and initiatives that have been introduced to reduce harm. She has uncovered controversial questions and used her knowledge of other initiatives to question motives and protocol of the government. I believe that continued discussion with me and several other students has assisted Ann in developing this wider knowledge and her understanding.
Most students should finish their task in about two lessons time. In the last 2 or 3 lessons, they will complete task 3
### APPENDIX E

**EXAMPLE OF A STUDENT’S SEQUENCE OF LEARNING**

#### Sequence for Jenny

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Written Data</th>
<th>Oral communication</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/02</td>
<td>Social constructivist transcription - Task 1. After reading three definitions on social constructivism, students were asked to interpret what they read. Jenny - Social Constructivism is knowledge built by many people. Through conversation and negotiation, the knowledge becomes a social view that everyone accepts. Evidence of her ability to socially construct a response is shown in Task 1.</td>
<td></td>
<td>After explaining social constructivism and giving students a variety of definitions, it seems Jenny has a reasonable grasp of social constructivism. This was beneficial in completing the rest of task 1.</td>
<td></td>
</tr>
<tr>
<td>12/02</td>
<td>After writing their own definitions, students were asked to get in pairs or threes and write all negotiated understanding in red. Here is what they wrote: Lisa and Jenny - Social Constructivism is knowledge that the community accepts because it was negotiated by many people and constructed by the community as a whole.</td>
<td>Jenny, with Lisa, developed an excellent and well thought out social constructive response. I believe that Jenny has developed a mental understanding of sharing knowledge and developing a negotiated meaning. She believes it will assist in developing a deeper understanding (interview).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14/02</td>
<td>Finally, after negotiating a definition, students were asked to form two groups and apply their definition to a real world scenario. One group examined the need to use socially constructive ideas to eliminate skin cancer and the other group investigated the advantages of socially construction when designing a campaign to reduce smoking. Group 1 (Diane, Hillary, Mary, Lisa and Jenny) – Skin Cancer The government initiatives, although they are working, are not totally socially constructed. Therefore, they are falling short of the objective at the present time. Perhaps more in roads can be made if the government used a socially constructed approach to preventing skin cancer. The government perspective on skin cancer and the prevention of skin cancer is targeted particularly at White Australians and young children. With a socially constructed approach, the prevention strategies would be aimed at a wider variety of cultures and ages. Perhaps more people for the various groups could make their opinion known as to what would influence them in taking notice of the government’s initiative. For example, the current advertising is aimed at children and this initiative would be better played during children TV shows. The lack of awareness amongst teenagers could also be addressed through graphic advertisements designed to scare people into being sun safe (similar to what they do in the smoking advertisements). These advertisements could be viewed during teenage style shows. To gain ideas of how to best convey the sun safe message to the Australian public, input from various groups involving culture and age should be sought. They can best help design an affective</td>
<td>Jenny has shown in this task that she can apply her understanding (of social constructivism) to various situations. This helped Jenny with task 3 and perhaps helped in managing and understanding feedback in task 2. Evidence was shown when Jenny negotiated an understanding of the action areas of the Ottawa Charter. She derived an understanding from text books, but after discussion with the teacher, was able to confirm some action areas and slightly modify others in terms of understanding. After further discussion, she was able to apply the action areas to government initiatives and successfully propose strategies the government might use to better utilize the Ottawa Charter as a better living</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
advertisement campaign. That is, they could propose content, when to show it and what would be most effective.

Some of the ways that the government could use that is social constructively based is:

- Surveys
- Phone polls
- Interviews

To eliminate skin cancer, the government needs to socially construct ideas and seek input from the community and the people affected. By doing this, the strategies will include the community and the message will have a more direct and influential nature.

<table>
<thead>
<tr>
<th>Task 2</th>
<th>Question negotiated by Jenny:</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/02/2006</td>
<td>a) Identify the most commonly used drugs in the community and explore patterns of drug use</td>
</tr>
<tr>
<td></td>
<td>b) Investigate government strategies that have been implemented to reduce the harm of drugs on an individual and society</td>
</tr>
<tr>
<td></td>
<td>c) Examine alternatives to the government strategies and detail the positives and negatives</td>
</tr>
</tbody>
</table>

Jenny’s notes:

*Government strategies and initiatives*

NATIONAL ALCOHOL STRATEGY 2005-2009

The government is focusing on a number of key areas to help with the reduction of alcohol-related health problems in Australia. These are:

- community understanding of the consequences of alcohol use and the need for shared responsibility of taking action
- examination of alcohol advertising and sponsorship controls
- examination of alcohol advertising and sponsorship controls
- price-related levers; levels of taxation arrangements
- development, implementation, review and enforcement of Liquor Licensing laws
- the impact of National Competition Policy on alcohol harm reduction initiatives
- responsible serving of alcohol. This includes quality, consistency and national portability of the qualification. Programs which address this will be evaluated.
- outlet density and hours of operation

ANN

What are you doing?

JENNY

I might focus on alcohol

ANN

There is such a strong stereotype. Alcohol is the most abused drug and people don’t see it as a drug… Because alcohol is more abused. Think about your friends alcohol is more abused rather than ecstasy or speed.

JENNY

Ann has got some stuff on drugs in general.

JENNY

We should examine the main abuses of alcohol teenagers

… and look at the way the government is addressing the abuse of alcohol.

… because if the legal age was 16 then people wouldn’t abuse it, but because they aren’t supposed to drink it, it becomes cool and rebellious.

JENNY

This is a good website. This is the stuff that I found on teenage drug use.

JENNY

After an explanation of task 2 (which included Jenny), the students started discussing the questions that they were going to negotiate or choose.

Group 2 discussed the different questions in depth. They decided on a topic that was mutually of interest and mapped out a plan of action to answer the question. They divided some tasks and searched the internet separately for the remainder of the lesson.

The social construct of knowledge occurred in earnest amongst members of groups and occasionally members of different groups. A consequence of the discussion was a collation of ideas and understanding. Some students discussed their questions with me and asked advice on an angle they could approach.

Most of the conversation between the students was from the current perspective of visual programs. However, a student from group 3 and one from group 4 had slightly more knowledge of the government initiative. One student is an avid reader of the newspaper and the other watched a current affairs program detailing the government’s initiative. This insight gave the group an advantage in understanding the procedure of the government in delivering initiatives and what considerations need to be taken into consideration before campaigns can be delivered to the public.
Alcohol and the government initiative and campaigns

(Jenny) talked to her partner and the teacher about the strategies the government should focus on. Who is important and why? After initial discussions, the developing national strategy to reduce tobacco harm was examined.

JENNY

This article has patterns of use for alcohol and drugs. We can write this down and then we can focus on one drug.

The government will be seeking information and comment from a wide variety of public sources around Australia. Stakeholder forums will be held in all states and territories, in metropolitan and some rural areas. The forums will address the views of: health care workers, educators, indigenous organisations, liquor licensing, local government, parent groups, police, representatives of the alcohol beverage and hospitality services industry, researchers and others. Comments will be taken from the public as general public input through an on-line feedback process (‘Have Your Say’ on the Department of Health and Ageing website).

*Alcohol*

- General Statistics -

Alcohol is the most widely used psychoactive, or mood-changing, recreational drug in Australia as it is a part of most social occasions, and people use it for a number of reasons; to relax, celebrate and have fun.

1 in 2 Australians aged 20 - 59 yrs, drink alcohol at least once a week. In 1997, Australia had the second highest per capita consumption of alcohol in the English speaking countries (behind the United Kingdom). In 1997, more than 3600 Australians died due to the affects of alcohol, 16% of all drug related deaths and 2.8% of all deaths in Australia. In 1998, 48.6% of the population regularly drank alcohol at least one day a week.

It has been found that males are more likely to drink regularly than females (59% compared to 39%). In a study conducted in 1998 on teenagers, two-thirds had drunk as the previous 12 months with 3 in every 10 being regular drinkers (drinking at least one day a week) and 4 in every 10 being occasional drinkers (less than one day per week). Once again males were found to drink more than females.

- Teenagers -

Alcohol is the most widely used and abused drug by teenagers. Around 72% of Australian teenagers have tried alcohol at least once. Alcohol is mostly tolerated as an acceptable drug, as it is seen as

Students spoke in depth about their progress to their partners and to me. More focus questions and areas of research resulted.

Group 2 investigated government initiatives in relation to tobacco strategies. (Jenny) talked to her partner and the teacher about the strategies the government should focus on. Who is important and why? After initial discussions, the developing national strategy to reduce tobacco harm was examined.

Jenny did not use the visitor’s comments in her work because her question (from the teacher) changed and required Jenny to work on solutions based on a framework.

She did, however, use the knowledge in general conversation when discussing some of the concerning problems that the government must address in relation to drugs in society.
2. Stimulants
Unlike depressants, stimulants do quite the opposite in their effects and increase or as the name suggests, stimulates the central nervous system. When taken in small dosages these drugs increase heart rate and blood pressure, promotes alertness, excitability and self confidence.
Stimulants have been linked to difficulties sleeping and the slowing of the metabolism's processes. If taken in large dosages these drugs can lead to over stimulation and can lead to physical problems, emotional difficulties.
Stimulant drugs include: nicotine, cocaine, caffeine and amphetamines.

3. Hallucinogens
Hallucinogens are drugs that seriously effect and can permanently damage the central nervous system. These drugs have a direct impact on the brain and dramatically impair the senses and therefore the individual’s perceptions of reality. The impact of hallucinogens differs depending on the amount.

Ann 21/Feb/2006

Developing personal skills
*help in improving safety and public amenity, one of the key areas the government is looking at is engaging employers and unions in examining risk, liability and other alcohol issues in the workplace. This would help in achieving a better, safer working environment for employers and employees in relation to alcohol usage. This would also improve the knowledge of workers about alcohol related problems and responsible alcohol consumption.
*

response to intoxication, the government is addressing the occurrence of intoxication in a number of settings. One of the main environments that promote intoxication is in private homes (i.e. parties, barbeques). Host responsibility programs have been set up as an attempt to influence environments other than licensed premises. In these programs, social hosts are provided with information and advice to reduce the likelihood of problems associated with intoxication.
*
government are striving to reduce the number of negative health outcomes of alcohol usage. This

TEACHER
Yeah. They have new commercials out. You will find new laws; i.e. legal limit for drivers on provisional licences. Lolly drinks are not advertised any more, etc.

JENNY
Police and stuff

JENNY
Like don’t drink and drive

TEACHER
Really. There are commercials that target different age groups, social status, etc.

TEACHER
you will find the government initiative follows a plan the Ottawa Charter. Use this to examine the campaign against the Ottawa Charter.

23/02/06 

Teacher’s comments: 

TEACHER
Jenny do you understand my comments?

JENNY
What are Developing Personal skills?

TEACHER
Developing Personal skills is teaching people make educated choices and help themselves.

JENNY
So education in schools?

Many of the students have noticeably focused on particular areas of the research question, in particular, Mandy, Annaliese, Jenny, Sara and Hillary. As a result, I have extended these students and asked them to explore their interest (as long as it was on topic). The students were noticeably enthusiastic about their amended tasks.

More discussion and peer learning occurred because of the questions being administered and the students asked some profound questions to the teacher and made some insightful statements.
will be done partly through a number of effective interventions. These include psychological and pharmacological interventions in residential and non-residential settings. In doing so people will learn the risks of excessive alcohol consumption and will hopefully respond positively. In order to increase the chances of positive response, the government need to address the specific issues of groups such as offenders who could be diverted for treatment or those with co-existing alcohol and mental health problems.

Amongst young people is a widespread problem among the Australian community with more young people drinking alcohol, drinking at an earlier age and increasingly adopting high-risk drinking patterns. This problem being addressed through a number of strategies, but major emphasis is being given to helping individuals, and increasing individual knowledge.

aim is to develop harm reduction skills and strategies for young alcohol users to use. This strategy should have a decent effect on young alcohol users, as it is hard to just to tell them that they should just stop and not drink, full stop. Because of social issues such as peer pressure, and acceptability, it is hard for young people to just not drink when it has become such a socially accepted habit. In giving young people the knowledge on how to cut down and minimise their alcohol consumption, the problem will be better addressed as the response should be positive. A strategy being developed is the promotion of adult responsibility and awareness of the risks associated with the provision of alcohol to those who are under age. This strategy will be very effective in the reduction of alcohol use in the home. At adult supervised parties, adults will have the knowledge to know when enough is enough so that intoxicated teens or those using alcohol in a dangerous way can have it confiscated or can be escorted home by their parents. If adults know how to manage underage drinking, then they can help take care of the younger people who do not know how to control their own drinking habits.

Final strategy that focuses on individual knowledge and the development of personal skills is the exploration of opportunities for prevention programmes in the workplace.

Amongst Aboriginal and Torres Strait Islander people has been addressed as its own individual problem due to the higher percentage of those who drink alcohol, consuming it at high-risk levels, especially amongst those in rural or poorer areas. To help out individuals in developing knowledge and their own initiative, the government is focusing on encouraging and supporting health workers to implement screening and early alcohol interventions for Aboriginal and Torres Strait Islander people. In this way, Aboriginal and Torres Strait Islander people can be given access to information and services about high-risk alcohol usage and this will hopefully bring down the high numbers of those consuming it dangerously.

---

**Jenny**

You have done an excellent job with your work and I think you have a good grasp of the material.

**Teacher**

Yes. Reorienting Health services is professional health workers going into schools or the workplace and educating people on preventative measures.

**Jenny**

Like police going to schools educating about drink driving?

**Teacher**

Yes, going into schools or the workplace and educating people on not drinking and driving. Strengthening Community Action the government supporting the community in carrying out the government’s initiative.

---

This lesson enabled more construction between teacher and student. While students continued working on their individual questions, I had the opportunity to converse with a few students who were keen to explain their research findings and their constructed thoughts that resulted from their research.

**Jenny**

confused two of the action areas of the Ottawa Charter. They are very similar and many examples cross over between the two (Strengthening community action and Creating a Supportive environment). After further discussion, Jenny was able to separate the two and provide a more appropriate example to explain the difference. She was also able to successfully identify government actions that supported each area. This is evident in the next two lessons where she modified her thought and added better examples to illustrate her understanding.
<table>
<thead>
<tr>
<th>in addressing &quot;Developing Personal Skills&quot;</th>
<th>Jenny how are you going with your research?</th>
</tr>
</thead>
<tbody>
<tr>
<td>106 &amp; 1/03/2006</td>
<td>application of the Ottawa Charter and she was developing a solid understanding of the advantages of applying the principles of the Ottawa Charter.</td>
</tr>
<tr>
<td>Remember, if you need any help for the other areas, please see me.</td>
<td>I told all the students that they would present an update on their research in two weeks.</td>
</tr>
<tr>
<td>Once again - EXCELLENT UNDERSTANDING Tony Stojkovski 01/Mar/2006</td>
<td>The students in this lesson worked in relative silence. This might be reflected in the recordings. By now, all students have their own specialist questions that they need to work on in conjunction with their work as a group. It was a good opportunity to talk to four students individually, and I had an opportunity to talk to the class about one of the students focus questions.</td>
</tr>
</tbody>
</table>

### Between the numbers of people who are at risk of or experiencing alcohol-related problems compared to the number who actively seek assistance for their drinking problems are very disconcerting to the government. A large effort needs to be put into improving the uptake of screening, assessment and brief interventions. As the government has found, these have been found to be cost effective and can be delivered in a wide variety of health care settings. Cost factors play a huge role in improving health services, with communities always having to deal with high health, social and economic costs. This is factor makes these services very important to the government’s initiative as money obviously plays a huge role. General Practitioners, practice nurses and Aboriginal health workers are ideally placed to deliver the interventions. In doing this, the government has ensured that those who need help receive full and professional medical treatment. |

### in some evidence that GPs have responded to programmes aimed at better engaging them in the provision of mental health services in recent times. This might generate fresh approaches in relation to alcohol-related interventions. GPs now also have pharmacological agents to support treatment of alcohol dependence. |

### hospitals are also taking part in the initiative by providing opportunities for interventions such as screening and referrals in their Accident and Emergency departments. In doing so, more lives can be saved from alcohol-related accidents, injuries and health problems if they can be treated effectively shortly after their onset. |

### Attention needs to be paid to developing numbers in the specialist drug and alcohol workforce to deliver alcohol treatment. Workers will be trained and sent out to communities to provide their services. |

### vulnerability of the higher risk groups (for example young people, Aboriginal and Torres Strait Islander people) has been partly put down to lack of access and opportunities and appropriate services. The government is looking at ensuring that young people who develop alcohol dependence have access to appropriate treatments so that they can be rehabilitated and given another chance at fulfilling their lives. Attention is also being paid to encouragement and support for health workers to implement screening and early alcohol interventions for Aboriginal and Torres Strait Islander people, implementation of brief alcohol interventions in various settings, ensuring Aboriginal people have access to the range of treatments available for treatment of alcohol dependence, and responses to co-morbid alcohol and mental health disorders. Young people can be helped a lot more easily than Aborigines, as they can seek help from their parents and the community quite easily if they will accept defeat to alcohol dependence. Unfortunately, Aboriginal and Torres Strait Islander people require a lot more work as they generally have a lower socio-economic status and will not accept help from the community as willingly. Because of this, they tend to live in areas that don’t have as widely available health services and in setting up services and treatments for them, they require a lot more encouragement from the community to go and actually seek the help they need. |

### need to be introduced to reduce the negative consequences of alcohol use in young people. The key area for attention with young people is community engagement and coordination in alcohol-specific and other general programs (including evidence-based schools programs). This should be able to build up social awareness between young people so they can take responsibility for themselves and
7/01/2006

The information you have gathered is excellent.
Mr Stoj

Is reorienting health services professionals or specialist going into the schools/workplace and educating people on how to prevent a problem. For example; Doctors, Police, Drug Victims (Anna Wood’s Mum) going into schools and telling the students that they should not take drugs otherwise they might become a victim?

And,
How is this different from strengthening community action? Is this the government giving money and/or support to community organisations such as the Injecting Rooms, etc, to help reduce the risk of harm from drugs similar?

Building Healthy Public Policy is the government creating laws (illegal to purchase or distribute drugs) to prevent the risk of harm from drugs similar?

Come and see me if you need clarification.
Tony Stojkovski
03/Mar/2006

7/01/2006

Strengthening community action
Some of community action has been targeted in relation to addressing negative health outcomes from alcohol consumption through helping out communities with services to address this problem. As preventing the problem of high-risk alcohol consumption by telling people to not drink irresponsibly all together is very difficult, the first step in resolving this issue is to target treatment and support for people with health problems associated with alcohol use and dependence. The government is looking at providing treatment for people with serious health and other problems associated with alcohol dependence. It is looking at providing a range of accessible, coordinated, evidence-based secondary and tertiary treatments and support services which will act as an effective way to reduce alcohol-related problems in the community. This key area should have a positive outcome as treatment and rehabilitation is always the first step to recovery in any negative health related circumstance. Community programs are also being set up to assist withdrawal and prevent relapse as well as accommodation and child-care services. As detailed reviews have been taken on possible services and the relevant research is being undertaken, the government is able to develop interventions and treatment services suitable to each individual (or a common individual’s circumstance) and group in the community.

• assist in improving safety and public amenity, local governments have taken on the role of improving amenity and urban design and addressing neighbourhood concern. In this way, they are aiming to build up supportive communities that provide safe environments for alcohol use and prevent high-risk use of the substance.

• introduction of random breath testing resulted in a dramatic reduction in drink driving related morbidity and mortality. With high, severe penalties of a Blood Alcohol Concentration over the limit, along with the high profile given to it by police, media and the community, to be charged for drink driving has become socially unacceptable. So, the community has built up a view against drink driving resulting in reduction of it happening as there are few people who go against what the community believes and sees as acceptable and unacceptable.

• government has set up community-based information campaigns to change understanding and attitudes about alcohol intoxication. In doing so, it is aiming to encourage people as a whole to support and protect each other from alcohol intoxication. This strategy also entails further resource development and community awareness campaigns regarding standard drinks and alcohol consumption guidelines so that as a community people can keep track of how much they are consuming and a socially acceptable amount of alcohol that can be drunk will develop.

Prior to this lesson, I viewed each person's website to view their work. Most students are developing a sound knowledge of their work and have extended their research well beyond the original question.

In this lesson, I talked to the class about other people's work and what they have found. Many of the students contributed to the discussion and the group socially constructed ideas such as, the governments double standard with ecstasy and the injecting rooms, the governments application of the Ottawa Charter for various lifestyle diseases and evidence that schools all over the world link healthy eating and exercise to academic performance. This was a very productive social constructive lesson.
Awareness plays a huge role in addressing high risk groups. Programmes need to be introduced to reduce the negative consequences of alcohol use. The key area for attention with young people is community engagement and coordination in alcohol-specific and other general programs (including evidence-based schools programs). This should be able to build up social awareness between young people so they can take responsibility for themselves and each other through school and youth programs, and also adults and the older generations can look out for them. Aboriginal and Torres Strait Islander people require strategies that include responses for the majority who live in major urban cities as well as those in rural and remote locations. In doing so the government must work with vulnerable communities to increase efforts to reduce the risks associated with alcohol use.

Creating supportive environments

* The government initiative does not outline any particular strategies to create a supportive environment; there are some strategies already in practice which do this.
* Address to alcohol-related harm and misuse, the counselling-based program Alcoholics Anonymous was set up where men and women support each other in solving their common problem. Alcoholics Anonymous is an international association of men and women who have had a drinking problem. It is non-professional, self-supporting, nondenominational, multiracial, apolitical, and available almost everywhere. There are no age or education requirements. Membership is open to anyone. This program is a good way of addressing alcohol-related problems as people can enter an environment where they will not be alienated or judged, as they can share their problems with others just like them. This program helps people to become aware of their problem and assists them in solving it themselves through self-determination and discipline.
* CityRail NightRide Service bus
  most trains do not run between midnight and 4:30am, Cityrail provides a bus service that is available between these hours
  service encourages people to continue to use public transport even in the early hours of the morning, rather than to drive
  initiative pinpoints drink driving, especially when travelling home from the city in the early morning, as this is the most vulnerable time for any person, as they are tired, making someone who is intoxicated especially vulnerable
  company was set up to reduce the numbers of drink driving, in which a free lift service on motorbikes is provided to take a person home when they call up the hotline. The origin of this initiative is unknown, but the response to it would be rather good as not only is the service convenient, it also requires little effort (i.e. don't have to walk to a station or shelter), the idea of a riding a motorcycle would draw in people, and it is also free of charge. These factors make the service a lot more desirable than catching public transport or driving home yourself.
* Bridge tolls have been reduced late at night. Driving into the city, the toll is as per usual charge, but coming out of the city, the toll is free. This strategy would encourage people to find alternate transport other than driving to make their way into the city where all the clubs, bars and motels are.

Jenny: The Ottawa Charter

Ann: What's that?

Jenny: A framework to reduce the risk of alcohol-related trauma.

Ann: Does the Ottawa Charter just apply to alcohol?

Jenny: No. Mr. Stoj said that it was designed for any problem.

Jenny looked at the last section of the Ottawa Charter. She asked me if the laws and legislations relating to driving, that have recently been implemented, have been a result of the government's initiative to reduce alcohol-related accidents. We also discussed some of the other laws the government has introduced to reduce the risk of harm from alcohol. Jenny and the Ottawa Charter makes for some interesting conversation. Many initiatives she has discovered are new and her suggested proposals are insightful. This is social constructivism at its best.

Teacher: Did you read the tips I gave you Jenny? Do you understand Building Healthy Public Policy?

Jenny: Yes I understand. Basically Building Healthy Public Policy is the laws that are made to control behaviour, like drink driving.

Jenny explains that it is a framework that has
Building healthy public policy

• Government has a number of laws that involve the use of alcohol in public and private environments
• The role of the community to enforce these laws
• On public premises, laws in relation to licensing laws, criminal, and anti-social behaviour are enforced by managers and police, in order to improve the safety of alcohol use on those premises.
• Liquor licensing authorities are concerned with the compliance of these laws. Because of this, stricter enforcement of these laws needs to take place. Policing and placement of authorities in clubs and bars needs to be taken on at a higher number, especially targeting areas referred to as ‘hotspots’
• The workplace, introduction of workplace alcohol policies can reduce alcohol-related harms. These policies would be developed to meet Occupational Health and Safety requirements.
• Introduction of random breath testing has caused a huge reduction in drink driving related mortality and morbidity. This is an example of a very successful strategy that addressed and succeeded in the reduction of alcohol abuse and drinking. Given the high profile and large penalties for those who are found with a high blood alcohol concentration, it has become socially unacceptable as well as expensive to be caught drink driving. As people are well aware of the likelihood of being caught driving whilst over the Blood Alcohol Concentration limit (>0.05) and understand well enough that once apprehended, penalties are inevitable and severe, extra special caution is now being taken by many people to ensure they are not over the limit if driving home. Success of this strategy is also a result of the high profile given to it by police, media and the community. Young people have been individually targeted, as drivers (on their Ls or Ps (red and green)) are much less experienced drivers and so therefore stricter limits are placed upon them with BAC not to be >0.05.
• Drinks labelling on alcohol beverage containers and alcohol consumption guidelines provide consumers with information regarding safe levels of consumption. Health warning labels are another strategy adopted by some countries. These strategies play an important role in keeping the public aware of what they are drinking and how much. This way an individual can know exactly how much they are consuming so they know if they are overdosing it if driving home and also makes them aware of their likelihood of intoxication. There are also common scenarios in public premises where people do not believe they have been poured a standard drink (e.g. in restaurants – big glass, not much wine). Standard drinks labelling on glass and bottles makes both the provider and consumer aware of whether they are providing or being given the legal amount of alcohol. Unfortunately evidence that they change drinking behaviour has shown to be rather weak.
• People are once again targeted in reference to underage drinking. Underage drinking laws are being heavily enforced in public areas and on private property. In public premises, proof of age must be shown in order to purchase a drink which ensures that the bar/restaurant/club etc. is not breaching the law by providing alcohol to a minor. Public places are required to post signs that inform consumers that they comply with underage drinking laws, making it illegal to try and purchase a drink if underage. On private property, it is illegal to provide alcohol to minors. This law should ensure that at parties parents and other adults cannot provide their children or other people’s children with alcohol.
government initiative states that there is comprehensive consideration of bringing up the legal age of drinking, from 18. This has been a response to the question as to whether at 18 a person is mentally and physically stable enough to be able to responsibly consume alcohol.

A total ban of the sale of alcohol has become a last resort for a town in Western Australia. Although the government is not planning on enforcing this rule state or nationwide, the fact there is question that it may be the last resort is a worry.

*Article from ABC news on-line, Friday March 10 2006*

Drink-driving madness prompts alcohol ban
Police in outback Western Australian have placed a short-term ban on the sale of alcohol in a town as a last resort to curb drink-driving.

Police in the eastern town of Laverton say despite three recent road fatalities linked to alcohol, some local drivers continue to ignore drink-driving laws.

Senior Sergeant Peter McLean says this month alone, 10 people have been charged with drink-driving offences. He says the situation is out of hand.

He says liquor sales from the town's only hotel will be banned for today and possibly tomorrow.

"That's all we can do to keep on top of it - if people can't control their drinking, we're going to have to control it for them," he said.

With at least two funerals being held in Laverton this weekend, police warn extra patrols will be on the roads to crackdown on any antisocial behaviour.

It is evident from Senior Sergeant Peter McLean statement that the responsibility does not just lay in the government's hands, but also with the people that they are trying to protect.”

References and resources:
http://www.health.gov.au
National Alcohol Strategy 2005-2009 Consultation Paper
http://www.alcoholicsanonymou\s.org.au/
http://www.ciyrail.info/nightride/index.jsp

9/03/20
06
You are very thorough in your research and your understanding of the Ottawa Charter is exceptional. It will certainly help you next year.

15/03/2
06
You have finished. You have learned and

Mr Stoj, can you please tell me where I’m sitting at the moment. I’ve examined the Australian national Health Strategy and its use of the Ottawa Charter. I think I have proposed some strategies that can be achieved, but can you let me know what you think.

In this lesson, all students had an opportunity to present their findings and research to the class. we all sat around the table and each student verbalised their research, while the rest of the class listened and asked questions.

Jenny then presented her knowledge and application of Australia's drug offensive in conjunction with the Ottawa
developed a greater understanding of the content of Core 1 and 2 than I could have hoped.

See me for the final task

Tony Stojkovski
16/Mar/2006

<table>
<thead>
<tr>
<th>Developed a greater understanding of the content of Core 1 and 2 than I could have hoped.</th>
</tr>
</thead>
</table>

| Charter. In complete contrast to Mary’s effort, Jenny understands the Ottawa charter’s principles and application. She was able to apply the Charter to several different problems (evident in her explanation). Several students (Mandy and Anneliese) related their topic to the Ottawa Charter and they were convinced that perhaps the government’s actions towards the problems they were studying were based on the Ottawa Charter. Jenny’s comprehensive knowledge shows that she has adapted to this type of learning exceptionally well.

This lesson confirmed the impending finish of task 2. I asked all students to talk to me about how they feel they are going after I gave each student personal advice on how they should complete task 2. Several students approached me regarding questions they had on the last part of task 2.

Jenny looked at the last section of the Ottawa Charter. She asked me if the laws and legislations relating to driving, that have recently been implemented, have been a result of the government’s initiative to reduce alcohol related accidents. We also discussed some of the other laws the government has introduced to reduce the risk of harm from alcohol.

Jenny grasp of the Ottawa Charter makes for some interesting conversation. Many initiatives she has discovered are new and her suggested proposals are insightful. This is social constructivism at its best. |
| --- |

<table>
<thead>
<tr>
<th>After completing task 2, a pair of students examined another student’s work. They then applied their knowledge to the student’s work to try and provide an alternative solution to the problem. Here is the solution that each pair/threes presented:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Group 1: Jenny and Ann</th>
</tr>
</thead>
</table>

Problem – Does the recommended amount of physical activity match the average person’s involvement? How can the government increase the level of activity and reduce the incidence of diabetes in Australia?

Answer – The Ottawa Charter as applied to participation in physical activity

Developing Personal Skills: This will involve improving the knowledge of individuals about the benefits of physical activity and the consequences if a lifestyle lacks participation. The way in which the government can engage individuals is to set up is to perhaps engage people in activities that improve knowledge. This can be done through the workplace, through screenings, or through community based activities. Schools can help in educating young people by introducing physical |
| --- |

<table>
<thead>
<tr>
<th>During the final task, we are able to see if the students were able to use the social construction over the unit to:</th>
</tr>
</thead>
</table>

1. prove their understanding
2. socially construct a solution with another person and create a successful solution to a new problem

Jenny successfully completed this task with her partner. Much of the discussion in previous lessons filtered through as the pair tackled this new task. |
| --- |
education programs, sports competitions, etc, which encourage the involvement of individuals.

Parents may also be targeted through the media and through special programs to teach them the importance of physical exercise at a young age.

Reorienting Health Services: This can be done through GPs and exercise specialist who can go out and provide their services through special screenings, which can look at the health status of individuals and apply their knowledge to recommend how much exercise should be done.

Strengthening Community Action: The government can provide communities with the resources to promote physical activity. One way this strategy has been used in recent times is the Fitness First Get Active Sydney event which is run each year and promotes a wide range of sports and physical activities and encourages the community to try new sports at the event. Through the use of the media, physical exercise and sports has been given a high profile, through televising sporting events such as the Commonwealth Games, the football and other big sporting events. This not only promotes the sports, but can also give people something to aspire to in their own participation.

Creating Supportive Environments: This strategy involves providing environments that will support and promote participation in physical activity. These include sporting clubs, gyms and school sports to name a few. Sporting clubs provide environments in which people with similar interests can join together to enjoy and play competitive and social sports, providing a professional, supportive environment. Sponsorship of sporting clubs also further promotes the sport through freebies and advertisement. Gym clubs such as Fitness First play a similar role, as do school sporting programs which encourage young people to take up physical activity in a supportive, non-discriminative, non-professional environment, which allows for relaxed enjoyment as well as competition if desired.

Building Healthy Public Policy: Creating laws and legislations that target participation in physical activity is unnecessary in supporting the initiative. By making physical activity compulsory, the enjoyment of it would be detracted by making it an obligation. Physical activity should be promoted as something done out of free choice if it is to be used throughout an individual’s life.
APPENDIX F
FOCUS GROUP QUESTIONS

1. Describe how the feedback and dialogue with the teacher affected your learning whilst doing your assignment
   - In doing your assignment, how important it was for you to get feedback and the questions from your teacher? Were the questions and the feedback helpful for your understanding of the task? In which way?
   - Describe how the program helped develop your research.
   - Did your teacher help you understand the work through discussion and through the program? Explain how he did/did not

2. Explain the process of learning you used with other students in the class.
   - Give details of how group conversations assist you in your assignment?
   - Did you enjoy learning about other student’s work? Why/why not?
   - Make clear how you tried to help other students over the program?

3. Explain the reasons why you enjoyed or didn’t enjoy the learning process and the reasons you might have been more motivated to investigate further.
   - Please explain how you able to explore areas of interest within your question?
   - During your investigation, did you discover new and interesting information? Give details
   - Did you use the program outside of class time? Was it beneficial? Why/why not?

4. Give your opinion of the program in relation to learning and how the process can be improved.
   - Why was the program easy/difficult to use?
   - Was it easy to follow the feedback given by the teacher and/or students? Explain
   - Did you enjoy the process? How could the process be improved?
• Explain how the flexibility of the program (use over the Internet anywhere, constant feedback) might be beneficial to learning and teaching.

5. Is there anything else you would like to add?
Interviewer

General talking amongst people. This is actually very important. You do have to approach this with a little bit of seriousness, ok? Now I have to read you these questions and then the idea girls is to get as much discussion going as possible, ok. All right? Ok, so the first one is, describe how the feed-back and dialogue with the teacher affected your learning whilst doing your assignments, ok. In other words, in doing your assignment, how important was it for you to get feedback and questions from the teacher and was the questions and feedback helpful for your understanding of the task and in which way. So we might just do that little bit. So I’ll just say that again. In doing your assignments, how important is it for you to get questioned and feedback? So how important is it for you to ask questions about the assignment and get feedback about this?

Hillary

Really important.

Interviewer

It’s really important, why though?

Hillary

Because I otherwise we don’t have any direction of what we’re doing.

Interviewer

Ok. So what you’re saying is you don’t have any direction. It helps you understand the task?
Hillary

Yes.

Interviewer

Ok. Anybody else?

Mary

Like we’re supposed to know if we’re doing the right thing or like how to expand on the topic.

Interviewer

Ok. Good. General laughter. what about the feedback like, after the assignment, were you given feedback about how you went? Was that helpful and why was that helpful?

Mary

We got feedback all the way through it.

Sara

Combined talk - Yeah, every time we’d do something in class like the next lesson at the bottom of our assignment - what we need to improve on, what we need to research more into… and give us a new question if we needed it or help.

Mary

And you ask a question, do you think you’ve done enough.

Diane
I was actually looking forward to that. I was looking forward to seeing how I was going. general laughter.

**Interviewer**

Ok. So you got continuous feedback. Ok that’s great. And you found that really helpful ?…………..?

**Diane**

Yes.

**Interviewer**

So what was one of the reasons you looked forward to that?

**Diane**

I felt like I was doing something wrong so I’m like, oh I’d better check and then fix it or ask a question

**Interviewer**

Ok, all right. So you found it really helpful in understand where you were at. Ok, great.

**Sara**

It made the task easier, like it was broken down into sections more.

……………..

**Sara**
You sort of could come and do something different. Like when I first got the assignment and read the question I was like whoa, there was so much research, but after we’d broken it down into different areas it made it manageable.

Jenny

Ok. So having smaller chunks, like breaking into smaller chunks was less stressful? Ok. And that helped you understand? Do you think that helped you achieve as well like, do you think you got a better mark…?

Lisa

It just made us understand it more because like if we researched it and didn’t fully understand it then he went through it with us till we understood it as well.

Interviewer

Ok. Fantastic. All right, that’s good. So the next point here girls is, describe how the program helped develop your research? Now I suppose we’ve just touched on that so one of the things was getting that sort of feedback and direction. So how did that help develop your research do you think?

Jenny

Well how it was broken up and with him saying like I want you to like research more and what you’ve done here is good. I think it helped us. Like we knew what to develop a really deep understanding and what effort into and what you should just touch on so everything was like, everything was there on our assignments now we know it’s in like the right proportions of exactly what we need to know.

Ok that’s great. Thank you. So basically you were told that you had enough in one area and maybe not enough in another.
Jenny

Yes.

Interviewer

And that helped to direct you in what you had to research further. Alrighty. Ok. Anybody else got any thoughts on the research? How did it help develop your research? Or maybe even your skills.

Diane

I don’t know we just continued each lesson …and the next lesson we did it, you just kept on doing it so you remember it more.

Interviewer

Oh that’s good.

Lisa

And like doing it through a website it made it easier than like carting like discs and CDs and email backwards and forwards and forwards and everything cause we could just access the website. Like it was a normal internet website and we just logged in and we could continue with what we were doing here instead of having to remember to email and save it at home and then transfer it…and here we could just like access it on the one website and that.

Interviewer

Did you find that easier than saving ………..where you’re in the library and you’ve got to ……………..
Interviewer

Ok. All right. That’s good. Next one is, did your teacher help you understand the work through discussion and through the program? Explain how he did or did not. So did your teacher help you understand the work through discussion and through the actual, you know, web program?

Jenny

He definitely helped. Like with the thing I was doing you sort of had to apply, like I was doing the? Ottawa Chart and like the very first thing he did was like explain it and then he was like …………..yeah, go back and do the work and as I was going he was like, well this is good but like some of this stuff actually fits into here and he sort of explains it along the way as well through the program and that. So my overall understanding is like really deep now.

Interviewer

That’s good isn’t it? Yeah. And do you think you would have that same deep understanding if you didn’t have those opportunities?

Jenny

Well like if I’d gone off and done the assignment at home like we do in normal research assignment I found that, like the first time I went through it and sort of like I tried to apply what I knew, some of the stuff was, it was like not quite there, like it was slightly off but once I sort of went through it and clarified it again I started to get it sort of spot on.
Right, ok. Thank you that’s a good answer. Anybody else? So how did, like did your teacher help your work through discussion?

Lisa

Yeah, like he got us all together every now and again to like just discuss each other’s topics. Knock on door – break in interview. Yeah, like by getting us together like discussions and that we were understanding each other’s assignments but we were also getting inputs from each other and when we lost interest he just left us alone and we came back to it later - laughing.

Interviewer

All right. So you lost interest occasionally. Was there a reason for that or…

Lisa

No, we’ve got short attention spans – laughing.

Interviewer

I won’t make any comments about that, I’m just going to let that go by. Ok. So how, was there any other way the discussions helped?

Jenny

We did one lesson where we just sat around the table and we just had to basically talk to everyone else and like discuss what we were doing and then they could ask us questions and that and that was really good because it like required you to have to be able to, not just like regurgitate what you’ve done, but to really know what you’re talking about and if they ask you questions then you had to be able to answer it on the spot so you really had to develop a really good understanding of what you were doing.
Interviewer

Yes. That’s great isn’t it? And I think that’s true. The more you get to talk about something, the more you have to understand it yourself. Because if you don’t understand it, you can’t really talk about it can you. It’s obvious but you don’t actually think about it while you’re doing it. Ok. Anybody else anything to add about that discussion? No? You’re doing fairly well girls. It’s great. Laughing.

Mary

Sure.

Interviewer

Ok. There’s five parts, right, you’re up to number two. Laughing. So you’re doing very well, ok. The next one is, explain the process of learning you used with other students in the class. So this is about your interactions with each other, ok, and what you did with each other. So it just says, give a few details of how group conversations assist you in your assignments. It’s kind of like what Jenny was just talking about, ok. So is there, can you put your finger on any way that talking to someone else in the group helped you in your assignment.

Hillary

We all had partners it was like reassurance. Like you could always check with your partner.

Jenny

In the last section when we have, like we have, cause we could go back into our pairs and put our knowledge together to complete the final part of the task so like we had to know what each of us had done and it all tied in together.
Interviewer

That’s very good.

Lisa

It just gave us like another way of looking at things by like talking to each other and that, and the fact that we were allowed to talk to each other about all the work and anything else kept us more on task and that because normally you’ve got a teacher sitting there going shut up and work basically, you’re more likely not to do the work.

Jenny

And also, like by talking to other people you can like correlate all the different ideas together so you can look at one thing from like nine different perspectives which is better than just one the teacher’s perspective.

Interviewer

Fantastic. Yeah. It sounds to me like you worked well as a team as well, like you were – laughing - ………………well done team. Loud laughing. Ok. So did you enjoy learning about other student’s work, did you enjoy sharing what everybody else was doing?

Sara

Yeah. It was interesting because obviously they would have to put in their ideas, but because they have better understanding of it, they would explain it better to get to understand it more.

Interviewer  Ok.

Jenny
I think it was like hearing about what other people were doing because basically you’re sort of learning about it. Like you’re on the same level of sort of intellect I guess. So everything like the say to you is sort of in a way, because they understand it you’re going to easily understand it too which it can be different to a teacher who knows the work that well that they can say something and think it makes sense while it actually doesn’t, like you know absolutely nothing about the topic.

**Interviewer**

Making it difficult too because sometimes you don’t automatically want to say I have no idea what you just said and it’s like with another student you can say, I’m getting a little bit lost here or I don’t really get that bit, what do you think? And that, yeah, that’s much easier that’s right. Any other thoughts? You people have gone very quiet. Laughing. Yeah. .....................No. Explain how task 1 – learning about social constructivism, helped you in task 2.

**Hillary**

Anneliesse have you talked yet?

**Interviewer**

I’m sure she’ll tell us what she feels when she feels ready

**Anneliesse**

I’m sorry.

**Mandy**
It helped understand that you can further your understanding by negotiating with other people.

Ann

Yeah. The more we talked, the more we understood about a topic. This helped in task 2, like Jenny knew about sports injuries and stuff and that helped us all, especially when other people joined in on the conversation.

Interviewer

Now it just says, girls can you make clear how you tried to help other students over the program. So can you sort of talk about one way that you might have helped someone else specifically.

Jenny

I helped Lisa in hers by she used me as a case study.

Interviewer

That’s great.

Diane

Yeah. Mandy heped me. She found some information for me like just out of the blue in a book or something and then she wrote it down and send it to me.

Interviewer

That’s wonderful.

Lisa
Yeah and like a few of the topics like overlap like I was doing physical activity and I think it was Mandy and Diane I think yeah. You guys were doing obesity and that and some of their information related to mine so we kind of swapped and shared.

Diane

Yeah, ..................

Lisa

And Ann was researching drugs … I had the text book and was flicking through it on the train one day I got bored and I found some stuff on drugs so I gave it to her.

Interviewer

That’s good, that’s really good. So you shared what you found with each other.

Lisa

Yeah.

Interviewer

So that really makes an impact on the workload too doesn’t it? If somebody finds something and gives it you that’s great. Ok. All right. Number three girls. Explain the reasons why you enjoyed or didn’t enjoy the learning process and the reasons you might have been more motivated to investigate further? So it’s kind of like why you enjoyed it or why you didn’t and the reasons you were motivated to investigate things or…

Diane
I wouldn’t mind doing it again.

Jenny

Yeah cause it didn’t seem as much as a chore. Like if we’d been given the assignment and he had said ok go home and do it its due in 2 weeks, I would have been like, oh my God, I don’t want to do it. I would have ended up doing it another time and done a bad job. But it feels like, I don’t know, the entire like environment was so like relaxed and because we could like help each other and stuff like that it just became a lot lot easier.

Diane

Like we came back each class and it was flowing

Jenny

Yeah.

Hillary

I think the freedom as well. You could pretty much research anything that had a link to the question. So you weren’t restricted to anything not interesting

Jenny

Don’t have any kind of stress about it.

Interviewer

Ok.

Hillary

It was just a feeling of ………lots of talking…………
Interviewer

So there’s a lot there isn’t there. There’s no deadline, you had a lot of freedom.

Hillary

You could do something that you liked which made you actually work longer.

Interviewer

Ok. And that relaxed environment…

Diane

Yeah.

Interviewer

And you find that, so that’s obviously more like conducive to your learning more.

Lisa

Yeah.

Interviewer

That’s really interesting isn’t it? Cause when you’ve got, I don’t know, it’s not usually like that is it? So if you compare that to your other classes, do you think this was a more effective way of learning.

Lisa
Lots talking, No doubt everybody else felt like, I didn’t dread coming to class…

Hillary

I wanted to like keep doing it.

Jenny

I had like a vague interest in my topic. I had more motivation like for once in my life I got the assignment done before it was due and I haven’t read over it since I submitted it and I know exactly what I said in it, I know the topic like the back of my hand, whereas an assignment I handed in yesterday I would have no idea what I put in it by now.

Interviewer

So you really think that learning sunk in as well?

Hillary

Yeah.

Interviewer

You can remember it.

Mary

Yeah.

Interviewer

Does everybody else agree?
Mary

Yeah.

Analiesse

It’s because there was a lot ……talking….. there was a lot, you had to research a lot and then summarise it and then put it in your own words because you’re putting it back up onto the internet site and like if you’ve been there claiming this, this, and statistics and all that then you know it’s not yours and you know you’re not going to get good marks for it, so a lot of it was information that you had to take in and then research further into that information and then put it into your own words. It sunk in.

Jenny

The thing was, it required your own opinion as well. Like it …like well research what the government is doing about this and then say whether you think it’s good or if it’s bad what do you think they should be doing. So, once again, it related back to like your own interest in the topic and that you can almost say what you want in it. It’s not just like a…

Interviewer

So you’re not regurgitating information? Like a whole lot of facts? Like this is the fact and write it all down in a different way. You actually have to put yourself into it, you have to think about it. Ok, that’s good. So during your investigation, did you discover new and interesting information and what was that? Did you find anything new and interesting?

Lisa

Yeah, I know in mine. I found out about heaps of the government initiatives like related to physical activity and like how they’re like trying to approach it
now through like aiming the initiatives in particular like school-age children, like the Active Australia one. Um, you basically get like primary school kids active two or so times during the week and it doesn’t cost anything and they provide like a free afternoon tea that’s healthy like fruit and water and you get them active for an hour and a half.

Interviewer

Excellent. Ok, so that was one thing you learned. What did anyone else find that was new and interesting?

Sara

I did the same topic as Lisa and I learned how physical activity we can affect thinking and how like if you’re involved in say more physical activity you’re less likely to be stressed and also it affects your mood.

Interviewer

Yes, yes, fantastic. Yes, there’s actually a high correlation between people who are involved in sports and things like high correlation in sport and high achievement academically. .....................I guess. Anybody else learn something new that you didn’t know before?

Jenny

I didn’t necessarily find anything that I didn’t already know but by reading, like cause I was doing alcohol and like the government initiatives, and just by reading it and then having to like apply it and stuff it gave you a better understanding of like why there were these certain legislations in that action and why the government like, resources to do this and that and that just developed my understanding better of what I already knew.

Interviewer
Ok that’s great. So getting a new tact on the topic?

Jenny
Yeah.

Interviewer
Anybody else? No? Ok. Um, did you use the program outside of class time?

Sara, Diane, Lisa
Yes.

Interviewer
Ok, and was that beneficial?

Diane
I got like one whole page done or something on like a Sunday because I was like oh I’m going to do my PD there so I just felt like doing it.

Interviewer
That’s a good sign that it was interesting and you were motivated.

Lisa
Yeah I did it at home like during the ads of the TV shows and that. I just had dad’s laptop and like you know there was nobody on MSM and I’m just in there and I just thought oh well I may as well work on PD like, you know, I’ve got nothing better to do and then once I got into it I actually abandoned the TV show so…
Interviewer

So what you’re saying is that by having that accessible so you did have this freedom at any time. Ok. Good. Ok number four. Give your opinion of the program in relation to learning and how the process can be improved. Ok so it sounds like this is what it is, how can it go further now. So, was the program easy or difficult to use? What do you think?

Sara

Easy. Yeah.

Jenny

My only complaint was that it was hard to read. Like when it was printed out because it was in these little text box things they like wouldn’t do bullet points and stuff like that. That was the only thing that annoyed me.

Lisa

And just the save button.

Interviewer

So that’s the formatting thing……all talking… Ok so you would have preferred a slightly different format?

Lisa

…all talking. Yeah the only problem with it was the formatting of the website and basically like, yeah, like you couldn’t do the stuff you could do in Word and then also if you weren’t saving it like every five minutes then like say you worked on it or like you got bored during class so you left the computer for like half an hour to go talk to your friends and that and you came back and like
you typed a bit more and then you clicked the save button then you lost all the work cause it refreshed the page you had to like redo it all again.

Interviewer

Oh ok.

Hillary

One of the save buttons didn’t work that annoyed me. And the text boxes it was like that big

Interviewer

So more text boxes and having to save really regularly…

Hillary

And also auto spell check things …..lots of talking together…..spelling and that. All shorthand the entire way through.

Interviewer

Yes it’s actually one of the dangers with SMS and MSM language.

Lisa

…talking together………. One day all that language will end up in the dictionary.

Interviewer

You probably will actually, you probably will. Ok so was it easy to follow the feedback given by the teacher and/or students? So was it easy to follow the feedback that Mr Stoj gave you?
Lisa

Yeah. Like they came up in order that he had like posted them. So like at the bottom there was like the first one up to the most recent and that and so…

Interviewer

Oh that’s great.

Jenny

It’s actually good because you could follow your progress. Like you could see how you develop a better understanding …………..and everything by reading back each comment.

Lisa

And also like if you didn’t get what he had written and that you could just easily turn around and ask him what he’s going on about so…

Interviewer

That’s good. And what about from each other. Was it easy to follow what each other was suggesting, or did you just find that process as being able to work together..?

Lisa

Yes I think we just couldn’t be bothered like doing it like on the computer we ended up talking to each other…..all talking….

Jenny
We didn’t make a thing of reading each other’s or giving each other feedback. Like I think when Mandy started one section of her assignment she went onto mine and read mine to, I don’t really know why she did, to get an idea or something. That was like a good idea but we didn’t necessarily make a point of giving each other feedback through the website at all.

**Interviewer**

Ok. All right. You more just talked about stuff directly

**Collectively**

Yeah.

**Interviewer**

Ok, all right, great. Did you enjoy the process and how could the process be further improved? So how, what, you know, how do you think it could be improved even further? I mean if you had to change things...

**Diane**

…everyone talking….. Maybe a different website name.

**Lisa**

We couldn’t do anything about that because of the Uni website .general talking.......... 

**Interviewer**

............................ok. Any other suggestions as to how the process could have been improved for you, like just on a really personal thing?
Jenny

I honestly think that the whole setting out and sort of formatting of the assignment was really good, like I found it personally really beneficial, like it just worked for me well.

Interviewer

Yeah, ok, all right. Explain how the flexibility of the program, we mentioned this before didn’t we, that if used over the internet anywhere and constant feedback might be beneficial to learning and teaching. So basically being able to pick up the laptop and (that one’s not on)... .......so being able to, yeah, pick up the laptop, log onto the net anywhere and have that sort of feedback already there, how’s that beneficial maybe for you?

Jenny

Well it was really good because it meant you didn’t have to carry books and stuff to and from home and that and also if you were like, if you felt, if you wanted to do sort of do the work between classes then you could do it and also Mr Stoj could give us the feedback then and then you can do more like you don’t have to wait for every couple of days or so to get the feedback and be able to do some further work on it. Like that was really good and it was just like and... There were no time barriers

Lisa

also like when like if you were away sick you could just like log in and do it cause I was away sick on and off for like two weeks and like I just sat at home doing the work and that.

Interviewer

Yeah that’s a huge benefit really isn’t it? Because you don’t need the class. It can be really annoying, particularly with the senior. If you need the class then
it can be quite difficult to catch up. Ok, any other things that were really good
about the fact that it was internet based?

Sara

You didn’t have to like to carry around disks or anything like worrying about if
you have it at home or in your locker….

Lisa

Like with other assignments like if you work on that at school and at home you
can have like twenty copies of it by the end of the term.

Sara

And you have to keep emailing it to and from school and home.

Lisa

And then you have the problem of which one’s the most updated one and
that….all talking….laughing….. So yeah like it was just a lot easier to deal
with in that way, the fact that we didn’t have to worry about all the crap, like
have I lost the disc again or anything.

Interviewer

Which is great.

Jenny

Really, really convenient just being there. Like it doesn’t matter where you are
you could be overseas and you could be doing your assignment.
Yeah.

Diane

Good like that.

Interviewer

It would be great if you could do all your work like that.

Jenny

Yeah until the computer dies and then…..laughing.

Interviewer

Like universities are leaning towards a lot of that.

Jenny

Well they do. They do like websites lectures and stuff.

Interviewer

Yeah, flexible delivery its called.

Jenny

Yeah, that kind of thing.

Interviewer

It depends on your personality a little bit too whether that works for you but you obviously were saying that that was a great thing. I wonder what it would
be like if you did every subject like that and you didn’t actually come to school.

Lisa

Yeah I don’t know if I’d like that. Maybe come once a week. …..talking….

Interviewer

Social time. So is there anything else you’d like to add about the process. Anything positive, negative or…

Diane

Can we talk about the teacher? No. ……laughing…..

Hillary

We like Mr Stoj

Interviewer

I’m sure you do. Well he’s obviously gone to a great deal of effort and thought about designing something that he feels would be beneficial for students and he’s trying to get his colleagues on board as well to try and look at what we do because I mean I guess it’s our mission in life really, it’s all about you guys at the end of the day and how you learn.

Diane

How you teach us ….laughing……
Well you asked, it’s true…. So anything else girls that you’d like to add.
Would you like to do it again? ...............do the whole thing again.

Collectively

Yes.

Interviewer

How could you see it, I’m just asking this because I’m an English teacher.
How could you see that applied to say, English for example.

Lisa

I don’t think it would work in like all the subjects. Like it probably wouldn’t
work in maths but then again nothing really works in maths.

Interviewer

Laughs.

Sara

I think it would help in English because like some people may have problems
with that structuring type of response for example an essay and you’d do it on
that internet based program like that would be really good. You would know
what to improve on and expand on. So you .................examples and stuff.

Interviewer

So it might be more a bit more immediate than having to wait for the teacher
and...

Jenny
Like getting feedback and going out at lunchtime to go and see…

Sara

You know what, it seems like a really good format, like when you have to sort of specially structure things and that and also stuff we need to research and provide your own ideas as well because then by doing that and having like teacher feedback 24/7 you can know you’re on the right track and develop your ideas further like throughout the entire thing and have the structure right and everything instead of just handing something in that you hope is right and come back and find out that it’s all wrong.

Interviewer

Yes. Because that can be a real difficulty with every subject, can’t it. You can just, you don’t get any feedback while you’re actually doing it and then you hand it in and then maybe you get a little bit of feedback afterwards but there’s always this feeling, oh it’s too late, why didn’t I know that beforehand. It gets really hard too in Year 12 because you’re not allowed to give you a lot of help with assessment task which is kind of difficult so you really have to make the most of Year 11 and try and get on top of it as much as you can. ……………..

Diane

With the word they should have something where they showed mistakesall talking……..

Lisa

I think like a couple of us we just ended up, we got sick of trying to, yeah we just copied and pasted what we were doing into Word.

Jenny
that wasn’t necessarily a bad thing

Lisa

That way we had a copy

Diane

I rely on spell check and stuff though. Fix it like Word

Interviewer

Anything else. Ok that’s it. Thank you very much

Recording finished at 31:33
APPENDIX H
AN EXAMPLE OF ANALYSIS OF STUDENT’S EPISODES OF LEARNING, USING SOCIAL CONSTRUCTIVISM

Hillary

<table>
<thead>
<tr>
<th>Study</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slavin, R. E. (1996) Research on cooperative learning and achievement: What we know, what we need to know. <em>Educational Psychology</em>, <strong>21</strong>, 43-69.</td>
<td>Hillary has developed a good negotiated understanding of social constructivism. Her knowledge is heavily used in the group’s negotiated response to the question asked in task 1.</td>
</tr>
<tr>
<td></td>
<td>Hillary’s work in task 2, especially involving gymnastics and eating disorders, is exceptional. Her discussions with the class, especially Jenny and the teacher, encouraged in depth research of her topic.</td>
</tr>
<tr>
<td></td>
<td>Hillary was able to assist other people in her group to develop an adequate response to task 3 question. This could have been better considering her work in task 2</td>
</tr>
<tr>
<td></td>
<td>Hillary works steadily and works well under the teacher’s guidance. She engages in frequent social constructivist interludes relating to her topic.</td>
</tr>
<tr>
<td></td>
<td>Hillary has developed good knowledge on her topic. Her social construct with her teacher and her resources of information (internet) has allowed her to develop an in depth knowledge of her topic. Hillary is able to take the questions discussed with the teacher and peers and find answers and more.</td>
</tr>
<tr>
<td></td>
<td>Her curiosity and desire to fill in gaps of her already vast knowledge and experience on the subject, led her to do deep research and ultimately conduct exceptional interpretations of the topic.</td>
</tr>
<tr>
<td>King, A. (1992) Comparison of self-</td>
<td>Hillary’s work in task 2, especially involving gymnastics and eating disorders, is exceptional. Her discussions with the class, especially Jenny</td>
</tr>
</tbody>
</table>

Her curiosity and desire to fill in gaps of her already vast knowledge and experience on the subject, led her in to deep research and exceptional interpretations of the topic.

Hillary asked some very educated questions of the teacher. She has a great understanding and interest in her topic.

Her topic has personal interest and her curiosity to find out more ensures that she develops a great depth of knowledge.

Hillary has developed good knowledge on her topic. Her social construct with her teacher and her resources of information (internet) has allowed her to develop an in depth knowledge of her topic. Hillary is able to take the questions discussed with the teacher and peers and find answers and more.


Carol, K. K., Chan; P. J., Burtis, P. J., Scardamalia, M., & Beretier, C. (1992) Constructive activity in learning from text. Hillary’s work in task 2, especially involving gymnastics and eating disorders, is exceptional. Her discussions with the class, especially Jenny and the teacher, encouraged in depth research of her topic.

Her curiosity and desire to fill in gaps of her already vast knowledge and experience on the subject, led her to do deep research and exceptional
| **American Educational Research Journal, 29,** 97-118. | Hillary asked some very educated questions of the teacher. She has a great understanding and interest in her topic. Her topic has personal interest and her curiosity to find out more ensures that she develops a great depth of knowledge. Hillary has developed good knowledge on her topic. Her social construct with her teacher and her resources of information (internet) has allowed her to develop an in depth knowledge of her topic. Hillary is able to take the questions discussed with the teacher and peers and find answers and more. |
| **King, A. (1991)** Effects of training in strategic questioning on children’s problem-solving performance. *Journal of Educational Psychology, 83,* 307-17. | Hillary’s work in task 2, especially involving gymnastics and eating disorders, is exceptional. Her discussions with the class, especially Jenny and the teacher, encouraged in depth research of her topic. Her curiosity and desire to fill in gaps of her already vast knowledge and experience on the subject, led her in to deep research and exceptional interpretations of the topic. Hillary asked some very educated questions of the teacher. She has a great understanding and interest in her topic. Her topic has personal interest and her curiosity to find out more ensures that she develops a great depth of knowledge. Hillary has developed good knowledge on her topic. Her social construct with her teacher and her resources of information (internet) has allowed her to develop an in depth knowledge of her topic. Hillary is able to take the questions discussed with the teacher and peers and find answers and more. |
APPENDIX I
PARENT CONSENT FORM

University of Wollongong

PARENT INFORMATION SHEET

Research Project: An Analysis of Computer-mediated Learning in a Social Constructivist Environment

Dear Parent/Guardian

I am writing to seek your permission for your son/daughter to participate in a research study “The Analysis of Computer-mediated Learning in a Social Constructivist Environment at Meriden School”. This study has developed because of my interest in improving learning, which I am studying for a doctoral degree at the University of Wollongong. Using technology as a medium, I have developed an environment in which students will use computers to communicate their ideas and thoughts to each other and to the teacher. Such environment, called social constructivist environment, aims to foster better learning and encourages students to develop a deep understanding of the content being taught and acquire thinking strategies during the learning process.

Data collection will occur during Personal Development, Health and Physical education classes in Term 1, 2006. With your permission and the permission of your child, I will collect information by observing usual classroom activities, collecting student work and recording students’ conversations as they work in groups. I will also arrange for Miss White, an independent person, to interview the students and ask them what they think of the learning activities, to ensure they feel they can give their honest opinions. The interviews will take about 30 minutes and will be conducted in a small group. The types of questions students will be asked include:

6. Describe how the feedback and dialogue with the teacher affected your learning whilst doing your assignment?

7. Explain the process of learning you used with other students in the class.

8. Explain the reasons why you enjoyed or didn’t enjoy the learning process and the reasons you might have been more motivated to investigate further.

9. Give your opinion of the program in relation to learning and how the process can be improved.

10. Is there anything else you would like to add?
The information gathered will be used in the data collection of this study and analysed to determine the results of the research being conducted.

Although every effort will be made to ensure risks to students are avoided, some students may feel uncomfortable about having their conversation recorded. Please discuss this with your child.

Data collected from this study will remain confidential and be available only to the independent interviewer, my supervisors at the University of Wollongong and me. To protect the privacy of participants, data will be coded to remove names and other identifying information prior to analysis. Quotations from data collected from this study will be reported anonymously through the use of pseudonyms. Data will be stored securely in the Faculty of Education for at least five years to conform to the University’s Code of Practice-Research and the Joint NHMRC/AVCC Statement and Guidelines on Research Practice (1997).

Participation in this study is entirely voluntary and you may withdraw your permission at any time by contacting me, Miss White or Mrs Bourke at Meriden School. Should you decline permission for your child to participate in the study, she will still undertake all classroom activities; however no data will be collected about your son/daughter. Refusal of permission will not disadvantage your child or affect your child’s relationship with the school. Should you withdraw your child from the study all data collected about your son/daughter will be destroyed.

Any questions about the study can be directed to any of the researchers (see contact details below). Concerns or complaints regarding the way in which the research is or has been conducted, should be directed to the Ethics Officer, University of Wollongong Human Research Ethics Committee on (02) 4221 4457.

Researcher: Mr Tony Stojkovski
Supervisors: Drs Sue Bennett & Irina Verenikina
4.1 Meriden School
Redmyre Rd
Strathfield, NSW, 2135
Phone: (02) 989 07 221
Email: tstojkovski@meriden.nsw.edu.au

Facility of Education
University of Wollongong
Wollongong NSW 2522
Phone: (02) 4221 5738
Email: sue_bennett@uow.edu.au
Dear student,

You will have the opportunity to participate in an innovative mode of learning. This involves you using technology to assist in completing research tasks during the school term. You will use computers to exchange and discuss your ideas and thoughts with each other and the teacher, which is aimed to facilitate an in depth knowledge of the content being studied. This is identified as the computer-mediated social constructivist environment. You will complete three tasks. All three tasks will require you to work with other students in order to achieve an optimal result.

To find out how effective these learning activities are, I would like to collect some information from you. If you agree to this, I will make some notes about what happens in the classroom and will keep a copy of your work. I will also ask each group of students to record their conversations about the activities using audio tape recorders.

Another researcher will also ask you what you think of the activities. The interview will take about 30 minutes and will be conducted in a small group. The types of questions you will be asked include:

1. Describe how the feedback and dialogue with the teacher affected your learning whilst doing your assignment?
2. Explain the process of learning you used with other students in the class.
3. Explain the reasons why you enjoyed or didn’t enjoy the learning process and the reasons you might have been more motivated to investigate further.
4. Give your opinion of the program in relation to learning and how the process can be improved.

5. Is there anything else you would like to add?

I will make sure the information collected about you is kept private. I will store the information in a locked filing cabinet. I will not use your name when talking or writing about what I find out.

Although all students in the class will do the same learning activities, you don’t have to be part of the study if you don’t want to. If you do not want to be part of the study, you will still complete the tasks, but no information will be collected about you. If you change your mind about being in the study, you can tell me, Miss White or Mrs Bourke.

Please talk to your parents about this note.

Please fill out this consent form together and bring it back to your teacher.

Please ask me, Miss White or Mrs Bourke if you have any questions.

Thank you

Mr Stojkovski
APPENDIX K

CONSENT FORM - PRINCIPAL

Research Project: An Analysis of Computer-mediated Learning in a Social Constructivist Environment

To whom it may concern,

I have been given information about the study of An Analysis of Computer-mediated Learning in a Social Constructivist Environment.

I understand that this study involves secondary school-aged children, and I believe that the respect for the participants’ welfare, rights, beliefs, perceptions, customs and cultural heritage has been considered in the design of this study. The integrity of Meriden and the students will be maintained throughout the study.

I understand, after reading the proposal, that the study should not disrupt normal classroom activities and all aspects of the study will be conducted with the knowledge and approval of the parents and students. Students and parents will be advised that they can discontinue their participation at any stage of the study. As the study involves no interventions beyond what students would normally receive, non-participation in the study will not affect learners’ participation in classroom activities and therefore students will not be disadvantaged academically or socially. No data will be recorded about non-participating students. Any data collected about students who discontinue participation will be discarded or ignored.

I have been assured that the privacy of individuals will be maintained throughout the study. Data collected will use an identifying code known only to the research team and all data will be stored in a locked filing cabinet in the Faculty of Education. Pseudonyms or codes will be used in place of real names or identifying details in any publications arising from this study.

Signed                                  Date

..........................................................   ....../...../......
PARENT CONSENT FORM

Research Project: An Analysis of Computer-mediated Learning in a Social Constructivist Environment

I have been given information about the study, An Analysis of Computer-mediated Learning in a Social Constructivist Environment, in which students will use computers to communicate their ideas and thoughts to each other and the teacher in order to facilitate deep learning. I have discussed the research project with my daughter.

I understand that, if I consent for my child to participate in this study, the researcher will:

- observe the normal activities in his/her classroom and,
- collect and store students’ school work,
- audio tape conversations students have when working in groups in class,
- ask students about what they think about the learning activities.

I have been advised of the potential risks and burdens associated with this research, which include the presence of audio recorders in the classroom.

I have had an opportunity to ask any questions I may have about the research and my child’s participation at either the information forum for parents or by contacting the researcher.

I understand that my child’s participation in this research is voluntary. I am free to refuse or my permission at any time. I have been assured that my refusal or withdrawal of consent will not affect my child’s relationship with Meriden School or the University of Wollongong, or disadvantage her in class.
If I have any enquiries about the research, I can contact the researcher according to the details provided on the information sheet. If I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on (02) 4221 4457.

By signing below I am indicating my consent for my daughter to participate in the research entitled An Analysis of Computer-mediated Learning in a Social Constructivist Environment, as it has been described to me in the information sheet. I understand that the data collected from my child will be analysed and reported anonymously in conference and journal publications, and I consent for it to be used in that manner.

Signed

.............................................................................................................

Date

.............................................................................................................

Name (please print)

.............................................................................................................

Your child’s name

.............................................................................................................

Researcher:  Mr Tony Stojkovski

Supervisors:  Drs Sue Bennett & Irina Verenikina

4.2 Meriden School

Faculty of Education

Redmyre Rd

University of Wollongong

Strathfield, NSW, 2135

Wollongong NSW 2522

Phone: (02) 989 07 221

Phone: (02) 4221 5738

Email: tstojkovski@meriden.nsw.edu.au

Email: sue_bennett@uow.edu.au
STUDENT CONSENT FORM

Research Project: An Analysis of Computer-mediated Learning in a Social Constructivist Environment

I have been told about the Analysis of Computer-mediated Learning in a Social Constructivist Environment research project in my class. I understand that in this study students will use computers to communicate their ideas and thoughts to each other and to the teacher, which will facilitate an in depth knowledge of the content being studied.

I understand that the teacher will examine our work and conversations throughout the term.
I understand that the teacher will write notes about what he sees.
I understand that the teacher will make a copy of my school work.
I understand that another researcher will talk to me about what I think about the project.
I understand that the teacher won’t use my name when writing or talking about the project.
If I have any questions I can ask the teacher, Miss White or Mrs Bourke.

I agree to be part of the research study.

Your name: ____________________________________

Signature: _____________________________________

Date:__________