

An Interdisciplinary Approach to Climate Change in the Middle Years: Summative Evaluation of the IMYM *Climate Change* Pilot Study



Contact Information:

Cheryl Prokopanko

Manitoba Education, Citizenship and Youth
Distance Learning and Information Technologies Unit (DLITU)
E-220 1970 Ness Avenue
Winnipeg, Manitoba R3J 0Y9
Telephone: (204) 945-6435
Email: cheryl.prokopanko@gov.mb.ca

Executive Summary

The IMYM (Interdisciplinary Middle Years Multimedia) interdisciplinary units derive their theoretical framework from the IMYM model. The IMYM model is an instructional model that blends an interdisciplinary constructivist approach with the integration of Information and Communication Technology (ICT) in order to achieve curricular outcomes. The IMYM model was designed to support teachers integrating ICT with their classroom practice. When using the IMYM model, the role of the teacher is less a disseminator of information and more a facilitator of active learning, as teachers gradually release responsibility to collaborative groups of students.

Manitoba Education, Citizenship and Youth selected fifteen teachers for the IMYM *Climate Change* pilot study over the 2003-2004 school year. Supports included student learning resources, the *Climate Change* interdisciplinary instructional unit, the online IMYM Professional Learning Community and two face-to-face professional learning sessions in August 2003 and February 2004 for the pilot teachers. Results were derived from the qualitative studies of the IMYM pilot teacher's online reflection journals, threaded discussions and feedback. Some of the key findings follow.

- There was modification in the teaching styles of some pilot teachers.
- There was change in some of the pilot teachers' perceptions regarding their role as a teacher.
- There was an increase in the job satisfaction of some pilot teachers.
- Some pilot teachers acquired new teaching skills.
- There was an increase in the technical knowledge and skills of some pilot teachers.
- There was an increase in the pilot teachers' and students' knowledge about climate change.
- There was an increase in the classroom management skills of some pilot teachers.

All key findings, as well as an overview of the entire IMYM *Climate Change* pilot study will be detailed within this report. In general terms, the IMYM *Climate Change* pilot study was deemed

a success by the IMYM pilot teachers, the IMYM development team, Manitoba Education, Citizenship and Youth and most importantly, the students.

CONTENTS

1.0 INTRODUCTION	1
2.0 IMYM MODEL	2
2.1 Summary	2
2.2 Establishing the IMYM Learning Community.....	6
2.3 Collaboration.....	7
2.4 Constructivism	10
2.5 Integration of Information and Communication Technology (ICT).....	11
2.6 The IMYM Teacher	13
2.7 IMYM Professional Learning Centres	14
3.0 OVERVIEW OF THE IMYM CLIMATE CHANGE PILOT STUDY	16
3.1 The Climate Change Interdisciplinary Unit.....	16
3.2 IMYM Online Learning Community.....	19
3.2.1 Interface	19
3.3 Selecting Pilot Teachers.....	21
3.3.1 Hardware, Software and Resources.....	23
3.4 IMYM Professional Learning Experiences	23
3.4.1 Day 1: Tuesday, August 26, 2003	27
3.4.2 Day 2: Wednesday, August 27, 2003	33
3.4.3. Day 3: Thursday, August 28, 2003.....	37
3.4.4 Follow-Up: Monday, February 23, 2004.....	41
4.0 RESULTS	45
4.1 Teacher Self-Assessment Rubrics.....	45
4.1.1 Pedagogical Skill in Integrating ICT with Curriculum and Classroom Practice	46
4.1.2 Self-Assessment of ICT Literacy	52
4.1.3 Key Findings –Self-Assessment Rubrics	60
4.2 Feedback on the Climate Change Interdisciplinary Unit.....	60
4.2.1 OLEs	60
4.2.2 ICTs	69
4.2.3 Module 1	79
4.2.4 Module 2	87
4.2.5 Module 3	92
4.2.6 Module 4	95

4.2.7 Key Findings-Online Feedback Forms.....	97
<i>4.3 Learning Journals</i>	98
4.3.1 Thoughts on Myself.....	98
4.3.2 Thoughts on My Relationship with My Colleagues.....	102
4.3.3 Thoughts on My Classroom.....	104
4.3.4 Key Findings-Journal Entries.....	106
4.3.5 Key Findings from Follow-Up.....	106 5
5.0 CONCLUSION	109
REFERENCES.....	110
APPENDIX A: SELF-ASSESSMENT OF PEDAGOGICAL SKILL IN INTEGRATING ICT WITH CURRICULUM AND CLASSROOM PRACTICE.....	113
APPENDIX B: SELF-ASSESSMENT OF ICT LITERACY.....	118
APPENDIX C: OLE & ICT FEEDBACK.....	123
APPENDIX D: MODULE 1 FEEDBACK	139
APPENDIX E: MODULE 2 FEEDBACK.....	145
APPENDIX F: MODULE 3 FEEDBACK.....	150
APPENDIX G: MODULE 4 FEEDBACK	155
APPENDIX H: CLIMATE CHANGE CONCEPT MAPS AND OVERVIEW CHARTS	158
<i>Overview</i>	158
<i>ICTs</i>	160
<i>OLEs</i>	161
<i>Module 1</i>	162
<i>Module 2</i>	165
<i>Module 3</i>	168
<i>Module 4</i>	171
APPENDIX I: PHOTOS OF IMYM CLASSROOMS.....	173
APPENDIX J: GLOSSARY	175

LIST OF TABLES

Table 1: Comparison of August 2003 with February 2004 Concept Mapping Professional Learning Activity	31
Table 2: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment Using of Educational Software	47
Table 3: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment Using ICT to Improve Student Writing.....	47
Table 4: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Information Literacy Skills Using Resource Based Literacy	48
Table 5: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Teaching Information Literacy Skills Using Primary Sources	48
Table 6: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Differentiated Instruction.....	49
Table 7: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Student Performance.....	49
Table 8: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Using ICT for Professional Research and Communication	50
Table 9: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Researching and Reflecting the Use of Technology in Education.....	50
Table 10: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment Engaging in Online Professional Learning	51
Table 11: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment Setting Up My Classroom.....	51
Table 12: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Computer Operation	52
Table 13: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of File Management	53
Table 14: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Networking	53
Table 15: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Word Processing.....	54
Table 16: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Spreadsheet Use.....	54
Table 17: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Database Use	55
Table 18: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Concept Mapping.....	55
Table 19: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Graphic and Animation.....	56
Table 20: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Information Searching	56
Table 21: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Internet Inquiry	57
Table 22: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Web Page Creation	57
Table 23: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Email Use	58

Table 24: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Multimedia.....	58
Table 25: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Digital Imaging.....	59
Table 26: IMYM <i>Climate Change</i> Pilot Teachers: Self-Assessment of Videography and Video Editing	59
Table 27: Statistical Representation of Feedback from Questions 1, 2, 4, 14 of OLEs 1-10 (see Appendix C).....	61
Table 28: Statistical Representation of Feedback from Questions 1, 2, 4, and 14.....	70
Table 29: The IMYM Model	107
Table 30: ICT Integration	108
Table 31: IMYM Online Learning Community.....	108
Table 32: Overview	158
Table 33: Module 1.....	163
Table 34: Module 2.....	166
Table 35: Module 3.....	169
Table 36: Module 4.....	171

LIST OF FIGURES

Figure 1: Representation of the IMYM Model	3
Figure 2: Screen Capture of IMYM Online Learning Community for Climate Change Pilot.....	21
Figure 3: Concept Map of ICTs.....	38

An Interdisciplinary Approach to Climate Change in the Middle Years:

Summative Evaluation of the IMYM *Climate Change* Pilot Study

1.0 Introduction

In 1996, the first of five IMYM (Interdisciplinary Middle Years Multimedia) interdisciplinary units was piloted under the sponsorship of Manitoba Education, Citizenship and Youth. All IMYM interdisciplinary units derive their theoretical framework from the IMYM model. The IMYM model contains four broad beliefs about teaching and learning (IMYM, “Research Results”)

- interdisciplinary constructivist approach to instruction (integration of curriculum)
- multiple disciplines are blended around a common conceptual theme to achieve deep understanding
- active student learning takes place in a real world context using Information and Communication Technology (ICT) as a learning tool
- the role of the teacher changes from a disseminator of information to a facilitator of active learning with a gradual release of responsibility to students

The IMYM model was “initiated in response to the identification of Technology as a Foundation Skill [TFS] area to be integrated throughout all Kindergarten to Senior 4 curricula. The purpose of [the IMYM model] is to develop an effective instructional model that supports integration of Information and Communication Technology [ICT] with curriculum through an interdisciplinary approach to instruction at each grade level of the Middle Years” (IMYM, “Pilot Overview”). There are currently over one hundred schools employing the IMYM model throughout the province of Manitoba.

There have been five IMYM interdisciplinary units piloted to date. Each unit is built around a different conceptual theme that integrates ICT with core curriculum. Prior themes were

- *Prairie Tour (Grade 5)*

- *Inventions, Innovations and Discoveries (Grade 6)*
- *Balance and Harmony (Grade 7)*
- *Systems and Interactions (Grade 8)*

The *Climate Change* interdisciplinary unit is the fifth conceptual theme and the theme for this pilot study.

The history of the IMYM model, the various particulars of the *Climate Change* pilot study, and the qualitative and quantitative results will all be detailed within this report. The results of this pilot study demonstrate that the pilot study was largely effective in integrating ICT into middle years curricula within the participating pilot teacher's classrooms. Furthermore, most of the pilot teachers reacted favourably to the pilot study and listed many positive impacts on student learning, their own teaching styles and their perceptions on their role as a teacher. There was also indication from the data that many of the pilot teachers experienced increased job satisfaction as well as appreciation for the opportunity to acquire new technical, instructional, and classroom management skills.

2.0 IMYM Model

2.1 Summary

The IMYM (Interdisciplinary Middle Years Multimedia) model is a curriculum-based model designed to support teachers who are integrating ICT with their classroom practice by providing a framework to achieve core curricular outcomes in an interdisciplinary context. The IMYM model is promoted by Manitoba Education, Citizenship and Youth through

- face-to-face professional learning
- online professional learning
- professional learning centres on CD-ROM
- professional learning on video

The IMYM model balances the integration of ICT with constructivist student learning, assessment strategies, and interdisciplinary curriculum (see Figure 1). The IMYM model draws upon content from core curriculum relating to a specified, pre-determined concept (e.g. climate change), the creation and maintenance of a constructivist learning environment in the classroom, and the use of authentic assessment, meaning that it assesses both the *process* as well as the *product* of engaged learning (Telus Learning Connection, 2002).

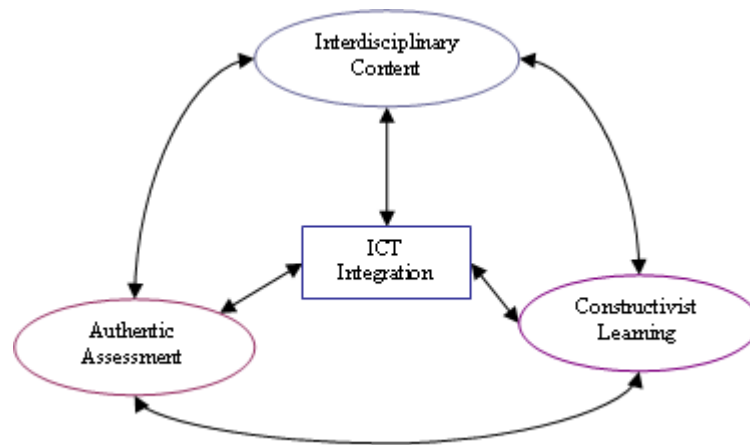


Figure 1: Representation of the IMYM Model

Teachers utilize the IMYM model for several reasons (IMYM, “FAQ”). One, the IMYM model can assist teachers in modifying their teaching style in order to better accommodate various student learning styles and multiple intelligences present within contemporary classrooms.

I continue to learn more about Grade 5 content and the IMYM model everyday. I am learning to step outside the box and experiment with new ideas and strategies. I try not to be intimidated by technology but to use it as a tool to help me and my students. My role as a teacher is changing in that I have had to give up some "control" and let students do some of the leading (IMYM Pilot Teacher, personal communication, February 23, 2004).

The role of the IMYM teacher evolves from disseminator of information to facilitator of active learning. The teachers, “gradually assume the roles of co-learners and co-investigators with their

students, of facilitators, and of coaches who are there at just the right time to ask the thought-provoking question that moves student thinking and learning to a higher level” (IMYM, “FAQ”).

My role as a teacher in the IMYM model has changed from being the giver of information to the facilitator in the students learning process. I have become in some aspects the monitor of the students learning and observer (personal communication, IMYM Pilot Teacher, February 23, 2004).

Two, in order to optimize the effective use of ICT as a learning tool, the IMYM model requires physical rearrangement of materials (e.g., desks, computers, etc.) within the IMYM classroom. In the rearrangement process, classroom materials are purposefully arranged so that ICT may be more effectively integrated. The result of this rearrangement process is often an increase in the authentic student use of ICT. For example, computers within IMYM classrooms are often arranged in an effort to accommodate collaborative student learning.

My classroom is shaping up nicely. I've gotten the new computers. I now have 5 in all. They are spaced evenly around the room. With only 16 students we have a lot of space...On Thursday, I should have all the programs I need installed on the classroom computers and connected to the main server. The students are sitting in groups of 4 and are adjusting to working together (personal communication, IMYM Pilot Teacher, September 16, 2003)

Another IMYM pilot teacher reflected

At present we have our computers on one side of the room, (classes are fairly small), our class pet, Gizmo the Guinea Pig, along the same wall, and a class library at the back of the room. The front has a long blackboard and the other wall is a series of cupboards for students to hang up their jackets and belongings...The student's desks are arranged in a U and there is a circle table in the middle. There is also room for 4 students to sit at the table Gizmo is on and then another large rectangular table near the cupboards, where up to 6 students can sit...Once I get a better feel for the kids I will move them into groups of 3 or 4 to do more group work (personal communication, IMYM Pilot Teacher, September 12, 2003).

Finally, the IMYM model can assist IMYM teachers in designing a learning environment that responds to their classroom and their students’ needs. The IMYM learning environment can increase the opportunity of students to better construct knowledge by using ICT and real world

connections to achieve core curricular outcomes. The current resources of any classroom can be easily incorporated into an IMYM classroom. There is purposefully no definite manner or method in which to set up an IMYM classroom because every IMYM classroom is as unique as the IMYM teacher, school and the community in which they reside. The following message was posted by a remote IMYM pilot teacher

At our school, students do not bring their own supplies. For some reason our supplies (pencils, paper, notebooks, etc.) did not arrive on the barge until this past Friday. We have had two days without water, a day without hydro and we are also short two classrooms. They are currently building two new classrooms for our Grade fours. This year I have 22 Grade five students. Our classroom now has four computers and one on the way. They are almost ready for our use! (Personal communication, IMYM Pilot Teacher, September 13, 2003)

The IMYM website contains principles, guidelines and other resources (e.g., photographs) to help teachers design their own IMYM classroom. By referring to resources such as these, interested teachers get inspired with and adapt new ideas for setting up their classroom.

There are also reasons why students would want to learn within the IMYM model. Students have the opportunity to increase their ICT skills and to acquire deeper lasting understandings of real world concepts. IMYM teachers have witnessed positive changes in their students' attitudes when the IMYM model is employed. An IMYM pilot teacher for the *Climate Change* study wrote

I had a discussion with a parent today which I found really interesting. They said that their child was having their best year in school ever. I see the IMYM model really playing a role in providing a positive learning experience for this student...a way for her to stretch her talents, and show off her learning. I have overheard her telling other students "Just wait until you are in this class next year! It's so much fun!"...a definite feather in the IMYM hat I'd say (private communication, IMYM Pilot Teacher, December 01, 2003).

The IMYM model was developed to provide both middle years students and teachers with the opportunity to integrate ICT into curricula and learning. However, successful ICT integration cannot be the sole responsibility of the classroom teacher. It is essential for IMYM

teachers to develop a network of support within their school and within their community. In fact, Manitoba Education, Citizenship and Youth encourages IMYM teachers to do so. Their network of support might include the principal(s), school division's ICT coordinator, technical trainer, technician, superintendent and other teachers within the school or division. "The collaboration of a team approach can result in a commitment to school growth and systemic change beyond the scope of the IMYM classroom" (IMYM, "FAQ").

The IMYM model draws its theoretical foundations from

- the community of learners theory (Brown & Campione, 1994; Scardamalia & Bereiter, 1994),
- constructivism (e.g., Jonassen, 1996, 2000),
- the integration of Information and Communication Technology (ICT) with classroom practice and curricula (e.g., Bitner & Bitner, 2002; Roberts & Porter, 1999),
- the value of interdisciplinary teaching in middle years schools (e.g., Martinello & Cook, 2000).

2.2 Establishing the IMYM Learning Community

In their community of learners theory, Brown and Campione (1994) found that respectful, contextualized discourse can be encouraged through a process of reciprocal teaching and guided discovery. In their view of a classroom community of learners, the teacher acts as a facilitator to the learning process. Brown and Campione believe that this type of facilitation can lead to distributed expertise among the community of learners whereby the distributed expertise of one learner benefits the other learners within the community via a process of knowledge-sharing and peer collaboration. Also important to note in their theory, is that the training of participants and the provision of guidance are both necessary components in developing an effective learning community.

The IMYM model provides guidance in the form of concept-based interdisciplinary units of instruction. The IMYM model promotes teachers as facilitators of learning and provides training and guidance in the pedagogy of gradual release of responsibility while encouraging synchronous and asynchronous peer discourse (e.g., face-to-face and online professional learning opportunities).

Scardamalia and Bereiter's (1994) 'knowledge-based communities' can be created by building knowledge among peers who reside within a wider sense of community. A knowledge-based community differs from a community of learners in that

It suggests continuity with the other knowledge-building communities that exist beyond the schools, and the term *building* implies that the classroom community works to produce knowledge—a collective product and not merely a summary report of what is in individual minds or a collection of outputs from group work (p.270).

The IMYM learning community includes IMYM teachers, Manitoba Education, Citizenship and Youth, Manitoba's school divisions' superintendents, technology coordinators and technicians, school administrators, teams of teachers and their students (IMYM, "FAQ"). When developing the IMYM model and the IMYM Learning Community, development leaders drew from both the community of learners and the knowledge-building community theories.

2.3 Collaboration

Collaborative learning is a fundamental characteristic of the IMYM model. This is because learning through collaboration, is a necessary component for the construction of knowledge (Jonassen, 1996). Collaboration between teachers, administrators, school divisions etc., within the IMYM Learning Community is imperative for strong peer relations, positive learning experiences and successful professional learning initiatives (e.g., Stallings, L. &

Koellner-Clark, K., 2003). Collaboration among students and between teacher and students is also strong in IMYM classrooms.

According to Pantiz (1996, ¶3), the difference between collaborative learning and cooperative learning is straightforward. “The underlying premise of collaborative learning is based upon consensus-building through cooperation by group members...whereas cooperative learning is defined by a set of processes which help people interact together in order to accomplish a specific goal or develop an end product” which is usually content-specific. Cooperative learning is a collaborative system of classroom management that is closely controlled by the teacher (¶4). Numerous collaborative and cooperative learning strategies were used in the IMYM *Climate Change* pilot study both in IMYM classrooms and at the face-to-face teacher professional learning sessions.

Collaboration can develop through cooperation. Jonassen (1996) identifies four elements of cooperation

- positive interdependence
- individual accountability
- face-to-face interaction
- interpersonal skills

The IMYM model sets up conditions that allow collaboration to develop within IMYM classrooms. In turn, the IMYM *Climate Change* pilot study set up the IMYM Online Learning Community to facilitate collaboration and cooperation among pilot teachers. The IMYM Online Learning Community, was developed using WebCT, is an online venue for pilot teachers and members of the IMYM learning community to collaborate synchronously or asynchronously (e.g., email, real-time chatting, threaded discussions). The design of the IMYM Online Learning Community also incorporates Jonassen’s four elements of cooperation.

To encourage positive interdependence, the IMYM Online Learning Community provides a *Communication Centre*. Within the *Communication Centre*, pilot teachers can

- email
- asynchronously post messages on a thematic and threaded discussion board
- synchronously “chat”
- review and post to a calendar of events
- share files and online resources with other pilot teachers

Within a discussion thread, the IMYM project leader can initiate discourse:

You can use this discussion thread to share what you are doing in your IMYM classroom this week. This is where you will be able to give and get ideas from each other about organizing the Climate Change pilot in your classroom. Let's create a true 'learning community' where everyone shares their ideas and where everyone's ideas are valued! (personal communication, September 08, 2003)

For the *Climate Change* pilot study, each pilot teacher was required to reflect upon their professional learning experiences in a journal. This process addresses Jonassen's (1996) element of individual accountability. The degree to which each pilot teacher made personal entries into his/her journal varied from pilot teacher to pilot teacher. The lowest number of entries made into a reflection journal was five, while the highest number of entries was eighty-two. The pilot teachers began entering into their respective journals in September 2003 and finished writing in their journals by the end of the follow-up professional learning session (February 2004).

Individual entries into the reflection journals are detailed later in this report (see Section 4.3).

Face-to-face interaction and interpersonal skills were cultivated during the professional learning sessions held in August 2003 and February 2004. Numerous strategies were used to encourage positive peer relations and collaboration during the pilot study. The majority of the pilot teachers had little previous experience with the IMYM model, so cooperation, and thus collaboration, was viewed as an essential support mechanism for them to succeed as IMYM teachers.

A study carried out by Yamagata-Lynch (2003) centred on a one-year curriculum-technology integration program for teachers (i.e. the Teacher Institute for Curriculum Knowledge about Integration of Technology [TICKIT]). Professional learning was delivered via peer collaboration. TICKIT teachers were encouraged to collaborate with other TICKIT teachers as well as administrators, non-TICKIT participants and university staff in an environment of pressure, set boundaries and multiple obligations. The end result of this study follows.

Experience of completing a successful curriculum technology integration project played a role in confidence building of individual teachers, groups of teachers working together, and school district administrators. This confidence gave further energy to teachers and school districts to continue to pursue district-wide technology curriculum integration. Additionally, when teachers faced a challenge they felt that they had connections with other teachers, both within and outside their school district (p. 604).

Collaboration in the IMYM *Climate Change* pilot was extended with as many creative outlets as possible to enhance the support network for teachers integrating ICT as well as to provide a means of information sharing of promising classroom practices. The value of such collaboration is also acknowledged within the theory of community of learners.

2.4 Constructivism

The definition of constructivism has evolved over the years. Today, there are upwards of six different *forms* of constructivism. These include personal, radical, social constructivism, social constructionism, critical, and contextual (Geelan, 1997). For the purposes of this report, constructivism will be understood as follows.

...knowledge is constructed out of personal sets of meanings or conceptual frameworks based on experiences encountered in relevant environments. People interact with their environment and as a result develop conceptual frameworks to explain these interactions and assist in negotiating future interactions (Newhouse, 2002, p.8).

Constructivism can be applied to both teaching styles and to teacher professional learning. Howard, McGee, Schwartz, and Purcell (2000) found that teachers learned most effectively about constructivism by *doing* constructivism. They suggest providing high levels of discussion, peer-to-peer tutoring, and learning by doing (p.461). Howard et al. approached teachers by “*content with learning context*” to help promote change of teaching practice towards constructivism.

Constructivism assumes that the individual learner is responsible for his or her own construction of knowledge. Even if the IMYM professional learning experiences are effectively conceptualized and presented to teachers, the teacher is ultimately responsible for his/her own learning. Likewise, even if the teacher scaffolds learning experiences for IMYM students, the student is ultimately responsible for his/her own learning. IMYM professional learning always models IMYM instructional strategies, so that the professional learning strategies are relevant and motivational to the teacher. Peterman (1993) argued that, “constructivist staff development projects [should] address the teacher as a learner and [should also] involve the teacher in *praxis*—doing, reflecting, learning, changing” (p.241).

Constructivism is an integral component of the IMYM model and the five IMYM interdisciplinary units. The IMYM model encourages learner (i.e. student and teacher) interdependence through constructivist strategies within interdisciplinary units and associated student learning centres. The IMYM model also encourages the pilot teachers to “do”, “reflect”, “learn” and “change” as Peterman (1993) suggests.

2.5 Integration of Information and Communication Technology (ICT)

When Information and Communication Technology (ICT) is effectively integrated into classrooms or curriculum, positive impacts on learning often results. Results include

- increased student motivation
- increased cooperation and collaboration among students
- deeper and more probing conversations between students and teachers
- encouragement of teacher-as-facilitator. (McGrath, April 1998)

The United Kingdom's (UK) government announced a major initiative to fund ICT integration initiatives into schools in 1997. The Office for Standards in Education (OFSTED) then conducted an extensive analysis on the impact of the UK government's initiatives to integrate ICT into their schools (2004). The OFSTED report provided an in-depth analysis into ICT integration initiatives and the impact they have had. The main and relevant findings are as follows

- increased staff competence with ICT
- increased ICT skills in students
- pervasive impact on teaching styles and student learning
- successful teacher training
- readily available technical support in schools directly improves the reliability of ICT resources
- positive impact of ICT in schools is rising and government initiatives to integrate ICT in schools are becoming noticeable

Manitoba Education, Citizenship and Youth sought similar results by implementing the IMYM model.

Most teachers can not easily or effectively integrate ICT into curriculum or classroom practice without professional learning and support. Moreover, if ICT is ineffectively integrated, it can play a neutral or even a negative role. Teachers need to develop a professional understanding of when and how to integrate ICT (Ping & Yong, 2003). Newhouse (2002) wrote an extensive literature review detailing the impact of ICT on teaching and learning and found that if ICT is effectively integrated, it can be a positive *impact on* (rather than *reason for*) learning and curriculum. The Committee of Development in the Science of Learning (2000 as

cited in Newhouse, 2002) suggests five strategies to use ICT to establish and sustain effective learning environments using ICT

- real world problems
- scaffolding
- feedback, reflection and guidance
- local and global communities
- extending teacher learning

Manitoba Education, Citizenship and Youth incorporates all five of these strategies in the IMYM model. The IMYM model creates effective learning environments for IMYM students and pilot teachers by addressing real world problems in interdisciplinary contexts (e.g., climate change). Manitoba Education, Citizenship and Youth defines scaffolding as “a strategy that provides adjustable and temporary assistance or support to the student in his or her achievement of the learning task” (IMYM, “Glossary”). IMYM teachers use ICT to scaffold students in the gradual release of responsibility for their own learning throughout the *Climate Change* pilot study.

Feedback, reflection and guidance were integrated into all IMYM professional learning experiences. Connecting and interacting with local and global communities was encouraged through the culminating Climate Change Awareness event of the *Climate Change* interdisciplinary unit. The entire process of being a pilot teacher extended professional learning not only of technical and pedagogical skills, but of real world issues in climate change.

2.6 The IMYM Teacher

Manitoba teachers, both male and female and of every age, came from rural, urban, inner-city and remote schools to participate in piloting prior IMYM interdisciplinary units. Neither gender, age, nor school location are variables of a successful IMYM teacher. “IMYM teachers experience most success if they are interested in learning to use teaching strategies that are

constructivist and that employ collaborative learning” (IMYM, “FAQ”). Manitoba Education, Citizenship and Youth recommends that any teacher interested in the IMYM model has

- experience with interdisciplinary instruction
- experience with collaborative learning strategies
- experience with differentiating instruction
- interest in using information and communication technology in the classroom
- interest in implementing constructivist and active learning strategies
- willingness to implement a middle years approach at Grades 5-8
- willingness to share new learning with colleagues through mentoring and collaboration (IMYM, “FAQ”).

Teachers interested in the IMYM model are also made aware that there are various stages they may pass through and that the process of becoming a successful IMYM teacher does not occur instantly. Based on prior IMYM pilots and observation, Manitoba Education, Citizenship and Youth outlines the following major stages a new IMYM teacher may go through.

- **Entry stage** – may experience frustration and anxiety; may tend to replicate traditional instructional and learning activities using ICT
- **Adoption stage** – tends to use ICT to support an established teacher-directed instructional format
- **Adaptation stage** - increases student involvement, responsibility, and knowledge creation; tends to develop new teaching style
- **Appropriation stage** - develops new instructional patterns built on a collaborative interdisciplinary concept-based approach to learning
- **Invention stage**- creates an entirely new learning environment in the classroom (IMYM, “FAQ”)

A potential IMYM teacher need not be overwhelmed by these stages but rather reassured, as support and expertise are provided through face-to-face professional learning experiences, the IMYM Online Learning Community, and through peer mentoring. Ultimately, if students are using ICT to learn in meaningful ways, then the IMYM teacher has succeeded.

2.7 IMYM Professional Learning Centres

Manitoba Education, Citizenship and Youth has created five IMYM Professional Learning Centres to provide IMYM teachers with opportunity for self-directed professional

learning. These five learning centres include information and resources supporting five key IMYM strategies: *Collaboration*, *Independent Learning*, *Authentic Assessment*, *Interdisciplinary Approach*, and methodology for *Setting up the IMYM Classroom*. Each Professional Learning Centre provides

- links to online research to activate prior knowledge
- a video segment featuring practicing IMYM teachers
- suggestions for applying the strategy in the classroom

The purpose of the *Collaboration* Learning Centre is to explore ways in which teachers and students can collaborate within and between IMYM classrooms. In the *Independent Learning* Centre, the purpose is to learn strategies for using student learning centres within IMYM classrooms to promote student responsibility. The *Authentic Assessment* Learning Centre encourages teachers to explore methods of authentic assessment of interdisciplinary and collaborative learning in their IMYM classroom while the *Interdisciplinary* Learning Centre encourages teachers to explore ways to use an interdisciplinary approach to teaching within their IMYM classroom. Using an interdisciplinary approach is fundamental to achieving the desired results of this pilot study. In the *Setting up an IMYM Classroom* Learning Centre, teachers explore ways to set up their IMYM classroom in order to make the best use of time and resources that are available to them and their students.

The Learning Centres are available within the IMYM Online Learning Community, on the IMYM website, and on a CD-ROM that has been distributed across Manitoba to assist potential IMYM teachers. The purpose of the IMYM Professional Learning Centres is to familiarize the teachers with the characteristics of the IMYM model. For the *Climate Change* pilot study, the teachers were given the opportunity to experience each of the Learning Centres during the August 2003 face-to-face professional learning session.

The Learning Centres have a consistent design. There is a short overview, followed by a list of learning outcomes, resources (e.g., articles, video segments, etc.), and a six step strategy. The six step strategy helps the IMYM teacher activate prior knowledge, acquire new knowledge through self-directed study of learning resources, apply new knowledge through classroom practice, and then share new knowledge with others by

- previewing online resources
- watching a short video segment featuring practicing IMYM teachers
- making their own notes on a BLM (Black Line Master)
- determining where to use the strategy in the IMYM interdisciplinary unit at their grade level(s)
- experimenting in their classroom with the strategy
- sharing classroom experiences and strategies with the online IMYM Learning Community

3.0 Overview of the IMYM Climate Change Pilot Study

The IMYM *Climate Change* pilot study was undertaken in response to the need for the integration of Technology as a Foundation Skill (TFS) throughout revised Grade 5 curricula in Manitoba. The purpose of the *Climate Change* pilot study was to develop an effective interdisciplinary unit to replace the exiting Grade 5 IMYM unit, *A Prairie Tour* ©1998. Replacement of *A Prairie Tour* ©1998 was necessary due to changes in Grade 5 curricular outcomes.

3.1 The Climate Change Interdisciplinary Unit

Cheryl Prokopanko (IMYM Project Leader), Janet Dent (Consultant), Aileen Najdich (Consultant), Michelle Larose-Kuzenko (Conseillère Pédagogique), Dawn Sutherland (Science Education Professor, University of Manitoba) and Dana Corr (Teacher/Writer, Park West School Division) comprise the IMYM *Climate Change* development team. The development team kept

the needs of Grade 5 students at the forefront of the decision-making process in creating the interdisciplinary unit on climate change.

The rationale for choosing the climate change conceptual theme was three-fold. Firstly, the diversity of topics and issues within climate change provided the opportunity to blend content from multiple disciplines; interdisciplinary content being a main component of the IMYM model. The climate change conceptual theme integrates learning outcomes from English language arts, science, mathematics, and social studies. For example, within Module 1 of the *Climate Change* interdisciplinary unit, students are required to

- collect, display and analyze weather and climate related data (i.e. mathematics)
- research water cycles (i.e. science)
- create comic strips on climate change to share with other students (i.e. English language arts)
- identify the importance of citizenship and the roles and responsibilities they have as global citizens (i.e. Social Studies) (IMYM, “About the *Climate Change* Pilot”).

Secondly, topics within climate change (e.g., weather, geography) directly correlate with Specific Learning Outcomes (SLOs) within Manitoba’s Grade 5 curricula (Manitoba Education, Citizenship and Youth, “Curriculum”). For example, within Grade 5 Science, students learn about weather. The topic of weather alone contains eighteen SLOs (i.e., 5-4-01 to 5-4-18). SLO 5-4-02 indicates that a student will, “describe how weather conditions may affect the activities of humans and other animals” while Module 2 of the *Climate Change* interdisciplinary unit states that students will “research consequences of climate change in the regions across Canada, and identify the social, economic, and environmental impacts” (IMYM, “*Climate Change* Concept Maps”). IMYM interdisciplinary units incorporate learning outcomes already identified and followed by teachers throughout the province.

Finally, the climate change theme is a serious issue affecting Canada. The Government of Canada states, “Climate change is more than a warming trend. Increasing temperatures will lead to changes in many aspects of weather, such as wind patterns, the amount and type of precipitation, and the types and frequency of severe weather events that may be expected to occur in an area” (Government of Canada, 2004). With climate change being such a timely issue, it is advisable for Canadian students to learn

- What is climate change?
- What are the consequences of climate change?
- What actions can individuals take to reduce climate change?

The *Climate Change* interdisciplinary unit consists of different types of learning experiences (LEs) including Ongoing Learning Experiences (OLEs), Information and Communication Technology (ICTs) Learning Experiences, and Module Learning Experiences. Each OLE provides ways for students to use ICT to complete daily, weekly, or monthly tasks throughout the school year. For example, OLE.3, *Daily Math and Problem Solving*, enables students to solve a weekly math problem and practice estimation, mental math and problem solving daily. Teachers choose from among the ICT learning experiences in order to introduce a particular ICT application to their students in the curricular context of their choice. ICT learning experiences are not repeated, nor is it necessary to do each one. For instance, ICT.4 *Looks Like This!* enables students to learn to use paint and draw software to create title pages.

There are four modules each of which has numerous LEs, all with different strategies for students to build and deepen their understanding of climate change

- Module 1 has eight learning experiences to investigate climate change
- Module 2 has seven learning experiences about the consequences of climate change
- Module 3 has six learning experiences about what can be done about climate change

- Module 4 has two learning experiences related to creating a climate change awareness event

Each LE provides a guide as well as necessary resources (e.g., BLMs) to help pilot teachers successfully complete the learning experience.

3.2 IMYM Online Learning Community

The IMYM Online Learning Community was created using WebCT™, an integrated e-learning software system. A particular strength of WebCT™ is that it provides licensed end users with the ability to customize the interface according to specific needs and style. All content within the IMYM Online Learning Community was designed for users with low bandwidth. In doing so, documents and resources can be easily obtained and shared by the pilot teachers no matter what type of Internet connectivity they have. WebCT™ provides a web-based learning environment in which online collaboration, mentoring and discourse between peers can occur. WebCT™ also offered the IMYM Project Leader a new way to conduct a pilot study by providing a forum for individual mentoring of pilot teachers.

Manitoba Education, Citizenship and Youth currently uses WebCT™ for various IMYM professional learning initiatives, such as the *Climate Change* pilot study. To participate in the IMYM Online Learning Community, pilot teachers need regular access to a computer with Internet connectivity. A user name and password is then provided to each pilot teacher to ensure security within the IMYM Online Learning Community.

3.2.1 Interface

The IMYM Online Learning Community uses a customized interface for each professional learning initiative. For the *Climate Change* pilot study, the five basic principles of web design are employed (Grantastic Designs, 2004).

- easy to read
- easy to navigate
- easy to locate
- consistent, and
- quick to download

The navigation system of the IMYM Online Learning Community is designed to be easy to use, with intuitive and consistent graphics. A link to the login screen for the IMYM Online Learning Community is situated on the left navigation bar of Manitoba Education, Citizenship and Youth's IMYM website (<http://www.edu.gov.mb.ca/ks4/tech/imym/index.html>). Pilot teachers participated in practice sessions of the IMYM Online Learning Community at the August 2003 face-to-face professional learning session and continued to participate throughout the Climate Change pilot.

The hyperlinks (see Figure 2) situated on the side menu bar of the IMYM Online Learning Community include

- *Homepage*
- *What's New?*
- *Professional Learning (PL) Experiences*
- *Discussions*
- *Communication Centre*
- *IMYM Learning Centres*
- *Sharing Centre*
- *Techie Toolkit*
- *Downloads*
- *Compile Notes*
- *Calendar*
- *Glossary*
- *Mail*



Figure 2: Screen Capture of IMYM Online Learning Community for Climate Change Pilot

Most of these hyperlinks are self-explanatory. The *Sharing Centre* is where the pilot teachers upload digital photographs of their IMYM classroom, display students' work, or share templates and files they have created. The *Techie Toolkit* provides technical documents and tutorials on how to resize digital photos, how to upload files to the IMYM Online Learning Community, and how to use the various software programs (e.g., *Inspiration*). *Compile Notes* makes all the notes associated with the *Climate Change* pilot study easily accessible and printable.

3.3 Selecting Pilot Teachers

Pilot teachers were selected based upon various criteria that included regional representation. The most important aspect of the selection process was assessing each teacher's level of expertise and interest in interdisciplinary instruction and instructional innovation. This criteria did not necessarily require a high level of ICT literacy because Manitoba Education, Citizenship and Youth believes that participating in the IMYM model is one way in which teachers can increase their ICT literacy. The process of selecting teachers for the IMYM *Climate*

Change pilot study was initiated by sending out information and an application package via the IMYM list serve and the Computer Education Coordinators of Manitoba (CECM) list serve.

The IMYM project leader outlined criteria these potential pilot teachers would need to meet in order to qualify for the IMYM *Climate Change* pilot study. These included

- teaching a grade 5 or grade 5 multilevel class during the 2003-2004 year
- teaching at least two core subjects to the same group of grade 5 students
- access to three computers situated within the classroom
- a letter of administrative support from the school of employment in the form of an email to the IMYM project leader.

The teachers were also required to write a personal narrative about their current understanding of the IMYM model and about what they were already doing in their classroom to integrate ICT with curricula. The reasoning behind this requirement was to ensure that the teacher was fully aware of the commitment and responsibilities expected and to see evidence of their dedication to improving the learning process and the integration of ICT with curriculum. Finally, potential candidates completed two self-assessment rubrics on ICT literacy and pedagogical skills in integrating ICT with curriculum and classroom practice. IMYM project leader Cheryl Prokopanko stated, “We need to know the level of ICT literacy and ICT integration of each teacher, but we did not eliminate anyone due to modest self-assessments on either of these rubrics. The self-assessment rubrics are primarily used to plan the professional learning experiences” (personal communication, April 04, 2004). The pilot teachers were informed at the start that their role would be to

- **Contribute** - to the IMYM learning community
- **Experiment** - with the IMYM model and the *Climate Change* learning experiences
- **Discuss** – their experiences with other pilot teachers
- **Share** - student samples and digital photos of their classroom
- **Reflect** - on their own learning, professional relationships, and classroom changes
- **Provide Feedback** – by completing online Exit Slips at the end of each *Climate Change* learning experience

Once selected, the pilot teachers received three days of face-to-face professional learning in August 2003, one day of follow-up in February 2004, and payment of all related expenses, including a substitute teacher.

3.3.1 Hardware, Software and Resources

The pilot study outlines hardware and software requirements for each pilot classroom (IMYM, “Hardware Model” & “Software Model”). The IMYM *Climate Change* pilot classrooms received the following resources

- a binder of *Climate Change* interdisciplinary learning experiences with an accompanying CD-ROM
- seven *Climate Change* posters
- two *Weather Trivia* calendars (2003 and 2004)
- a digital camera
- five copies of *Inspiration* concept mapping software
- *Calendar Club* CD-ROMs.

Each school provided the teacher with at least three classroom-based computers, access to the Internet, and office productivity software for their IMYM pilot classroom.

In addition, the pilot school provided access to the following hardware and software

- presentation device (such as a large screen TV, data projector, or electronic whiteboard)
- printer
- VCR
- an email client (e.g., Microsoft Outlook)
- multimedia authoring software
- photo editing software (e.g., Microsoft Office Picture Manager)
- website authoring software (e.g., Microsoft Front Page)

3.4 IMYM Professional Learning Experiences

There are many ways to define professional development, or as Manitoba Education, Citizenship and Youth prefers, professional *learning* (PL). Schlager and Fusco (2003) define professional learning for in-service teachers as

...a career-long, context specific, continuous endeavor that is guided by standards, grounded in the teacher's own work, focused on student learning, and tailored to the teacher's stage of career development. Its objective is to develop, implement, and share practices, knowledge, and values that address the needs of all students. It is a collaborative effort, in which teachers receive support from peer networks, local administration, teacher educators, and outside experts (p.205).

Many of the components of Schlager and Fusco's definition, such as context-specific, continuous, collaborative, grounded in the teacher's work, and focused on student learning, are incorporated within the professional learning experiences of the IMYM *Climate Change* pilot study.

Craft (2000) suggests that PL initiatives should aim to improve teachers' pedagogical skills, provide an enhanced learning experience, and assist in developing deeper professional knowledge and understanding. PL about the IMYM model is intended to

- develop professional judgement as to when and how to use ICT to teach and learn
- increase job satisfaction
- develop a more constructivist view of the teacher's role
- enable teachers to anticipate and prepare for change
- aid in clarifying Manitoba Education, Citizenship and Youth's position on infusing ICT

However, IMYM professional learning on ICT integration is more than effective collaboration between teachers. It takes into account the professional growth plans of individual teachers and helps them develop professional judgement on the value of using educational technologies within a collaborative learning environment for a particular student audience and learning purpose.

Teachers bring their own technical experience, opinions and expertise to the PL equation and should be active participants who are free to choose strategies that match their own teaching and learning style (Garet, Porter, Desimone, Birman & Yoon, 2001). IMYM professional learning models the teaching strategies that are being proposed, builds on participant expertise, and scaffolds teacher learning. "In order for teachers to feel comfortable using technology,

professional development must take place in such a way that teachers feel confident in their abilities” (Bliss & Bliss, 2003, p.95).

Other considerations in defining and understanding the parameters of PL concerning ICT integration are teacher personality and needs and teacher responsibilities and workload (Yamagata-Lynch, 2003). A PL provider should consider the teachers’ learning styles, personal levels of confidence and perceived control both within the PL group and within their school and classroom (Nisan-Nelson, 2001). IMYM professional learning keeps in mind that teachers are adult learners, every teacher learns differently, and some teachers may be afraid to introduce new technologies into their classroom.

PL providers should be aware of any issues that may be occurring within the school or within the PL group, as well as of the level of support of the school and its administration for the new initiative. Negative situations occurring within the school will greatly detract from the teacher’s ability to effectively learn and teach. Therefore, it is the priority of IMYM professional learning to understand the specific context, needs and situation of the teachers and their school before planning the PL sessions. In this way, context and teacher-specific PL can be delivered in a more effective manner.

Applying the theory of teacher change (e.g., Clark & Hollingsworth, 2002) also plays an important part in ensuring the effectiveness of PL. IMYM teachers need to modify their teaching styles in order for ICT integration to be sustained in the classroom. Clark & Hollingsworth identify six perspectives on how teacher change occur

- change as training
- change as adaptation
- change as personal development
- change as local reform, change as systematic restructuring
- change as growth or learning (p.948).

The focus of PL should not just centre on any of these perspectives, but it should focus on the teacher as active learner through reflective and collaborative participation in all of these perspectives within the PL setting (p.948). This can include collaborating with peers, experts, parents, outside community members, school administrators, and so forth. Collaboration such as this assists in creating a forum of discussion as well as a support network for teachers. This type of forum, if continually utilized by the teachers, could assist their teaching skills and knowledge (Burbank & Kauchak, 2003). The IMYM Online Learning Community and face-to-face professional learning sessions provide this forum for *Climate Change* pilot teachers.

Professional learning was originally defined as continuous career-long, context and teacher-specific endeavours based on pedagogical standards in order to train and assist teachers to meaningfully learn, understand and use ICT within a collaborative learning environment. After further review of literature, this definition can be expanded to include a cautionary warning to PL providers to be aware of their own biases about PL and to acquire more specific information about the participating teachers. Furthermore, professional growth plans ought to consider the participating teachers' specific needs, personal and professional issues that may be occurring, their areas of specialty, personalities, workloads, learning and teaching styles. This must all be carried out while understanding the theory of change in relation to teachers and technology.

Every task within the IMYM face-to-face professional learning in August 2003 correlated directly with the *Climate Change* interdisciplinary unit. With this strong correlation, the teachers were directly and indirectly learning about the IMYM model, *Climate Change* and the various ICT integration strategies they would have to employ with their own students. The face-to-face professional learning assisted in the

development of an IMYM community of learners to encourage increased collaboration and support among the pilot teachers throughout the year using the IMYM Online Learning Community. The IMYM project leaders used the self-assessment rubrics that were previously completed by the pilot teachers, and their own experience as teachers, to carefully construct this pilot study and the following professional learning experiences.

3.4.1 Day 1: Tuesday, August 26, 2003

As the pilot teachers arrived, they were greeted with five pre-arranged centres. These centres model the use of IMYM learning centres that encourage independent learning in the IMYM classroom. The centres were

- name tag centre
- coffee mug centre
- binder reminder centre
- digital camera centre
- parking lot centre.

Each pilot teacher received a name tag which was worn throughout the entire three day session to encourage teachers to build relationships. The coffee mug centre provided refreshments and a reusable “Grass Roots” coffee mug to encourage a personal commitment to sustainable living both during the PL sessions and throughout the entire *Climate Change* pilot. The binder reminder centre provided each pilot teacher with a binder of information concerning the *Climate Change* pilot study as well the *Climate Change* interdisciplinary unit. Pilot teachers were encouraged through the PL sessions to organize and personalize the interdisciplinary learning experiences in this binder in preparation for their classroom and students. This task models OLE.1 *Personal Binder Reminder* where the learning objective is to organize and maintain work in an OLE personal binder.

The digital camera centre allowed the teachers to pick up their digital cameras and familiarize themselves with its features as they took photos of each other to use in the ICT.3 *Riddle Me This* email strategy where the learning objective is to write, send, receive and reply to emails. An accomplished digital camera user assisted with any questions and modeled ICT.7 *Caught In Action* where the learning objective is to use a digital camera and/or a video camera to collect primary data to support learning. Finally, in the parking lot centre pilot teachers recorded any thoughts, concerns or questions on chart paper for the entire group to see. The questions were gathered by the project leaders and answered throughout the session.

After introductions and an oral walk-through of each centre, the purpose and agenda of this face-to-face workshop were reviewed and focused around four main themes

- content of the draft IMYM *Climate Change* interdisciplinary unit (see Appendix A)
- methodology of interdisciplinary and collaborative instruction and assessment in the IMYM model
- pedagogy and management of using ICT to enable learning in the IMYM classroom
- functionality of the IMYM Online Learning Community pilot environment.

The icebreaker involved the use of the IMYM Online Learning Community as a means to familiarize the pilot teachers with the online environment and with one another. Each teacher provided clues about him/herself to the group through an email message on the *Discussion Board*. Later, the pilot teachers emailed each other to ask questions and to match clues with identities (ICT.3 *Riddle Me This*).

After viewing a brief demonstration of concept mapping software (i.e. *Inspiration*) to brainstorm how the teachers were already using ICT in their classrooms, the pilot teachers created concept maps on how they thought the IMYM model might look, feel, and sound within their own classroom. This strategy was particularly informative as it was repeated at the follow-up session (February 2004) for comparison. Many of the teacher's initial perceptions of the

IMYM classroom became more detailed in their follow-up concept maps. Below is a list of what some of the pilot teachers indicated in August 2003, before the commencement of the pilot study. In the right column is the list of what these same pilot teachers stated in February 2004, after the completion of the pilot study.

<i>What your IMYM Classroom Looks/Feels/Sounds Like?</i>	August 2003 (prior to pilot study)	February 2004 (after pilot study)
Looks	<ul style="list-style-type: none"> • small group demonstrations • sharing • whole group • learning Centres • presentations • review • instruction • computers • groups 	<ul style="list-style-type: none"> • technology present • organized • groups • learning centres • different tasks to suit different needs • students active • me circulating around the room • lots of things on the go at once • computers in use • small groups (frequently changing)
Feels	<ul style="list-style-type: none"> • organized • busy • proud • excited being there • warm • friendly • sharing ideas • laughter • noise 	<ul style="list-style-type: none"> • frustration • progress • feels good • successes • talking • laughter • visiting • off-task noise • questions • paper shuffling • focused voices • peer tutoring

Sounds	<ul style="list-style-type: none"> • enthusiastic • exciting • noisy • quiet • successful • welcome 	<ul style="list-style-type: none"> • discussions • busy • movement • peer help • collaborating • sharing • active • motivating • life long learning • panic • accomplishment • confidence • rewarding • overwhelming • confusing • exciting
---------------	---	---

Table 1: Comparison of August 2003 with February 2004 Concept Mapping Professional Learning Activity

After the concept mapping and sharing, the pilot teachers formed small groups to become familiar with communicating within the IMYM Online Learning Community and using ICT with curriculum. This task correlates with both ICT.3 *Riddle Me This!* and ICT.6 *Inspired* where the learning objective is to use concept mapping software to organize information. The pilot teachers were required to solve a puzzle of identifying the other pilot teachers by creating and replying to email messages. By providing the pilot teachers with the opportunity to become familiar with the IMYM Online Learning Community and two of the learning experiences (ICT.3 and ICT.6), it was hoped that the IMYM Online Learning Community would be used more frequently and that ICT.3 and ICT.6 would become easier to implement within their own classrooms.

The next task involved activating the pilot teachers' prior knowledge about climate change by completing an online quiz within the IMYM Online Learning Community called the "Climate Change Challenge". The pilot teachers used their personal online learning journal to record their answers to the following questions: What do I know about climate change? How will

I use the *Climate Change Challenge* in my classroom? This task directly relates to OLE.8 *Reflection Journal* where the learning objective is to reflect on learning in a journal and to the Module 1.1 *The Big Picture* where the learning objective is to identify the importance of citizenship, their roles and responsibilities as global citizens, and aspects of sustainable development.

At the conclusion of Day 1, the teachers completed an online exit slip on what they had learned about the four themes, as well as provided feedback on the strengths and challenges of participating in the IMYM Online Learning Community. Homework was to familiarize themselves with their new digital camera and charge their batteries (both literally and figuratively).

Following are some comments of the IMYM pilot teachers concerning their experiences on Day 1 of the orientation.

Wow, it is amazing how quickly we can jump right back into learning after a summer of leisure. I've had a great day, I've learned a ton. I learn by doing and today there was a lot of that. I'm looking forward to keeping in contact with this group from all over Manitoba. Inspiration looks great, easy to use, somewhat. I'm hoping we can review it. I enjoyed the "discussion part of our mail". Hopefully this will become familiar quickly (personal communication, IMYM pilot teacher, August 26, 2003).

I have worked with the IMYM model before, but this interdisciplinary unit is very interesting and I can't wait to try it out. I'm pleased with today's session because I have learned a lot. Although I'm familiar with IMYM, there are many things that are new to me. I'm still learning. I find this group to be open to sharing and the teachers seem to be very co-operative. I can't wait to use the IMYM Online Learning Community. I have not been teaching this way for years (change of school and the rotation system made it harder to use the IMYM model). I am a bit rusty in some areas but I have learned a lot...things are coming back. I am willing to help out any way that I can (personal communication, IMYM pilot teacher, August 26, 2003).

I was concerned about being able to keep up with the technology but I have found that I am more "computer literate" than I thought. I have not been a pilot teacher before and I am excited about what I have learned so far with regards to WebCT

and group discussions. I think this is going to be a valuable tool during the program. I have found that there is quite a bit of overlap between the IMYM strategies and the ones I already use in the classroom, but as you participate in them instead of facilitate them you learn different ways of using the strategies (personal communication, IMYM pilot teacher, August 26, 2003).

There is a lot of information to be learned in a small time frame. I see one of my strengths as being able to utilize and integrate technology within the curriculum once I have built up a certain level of skills and comfort. I also enjoy collaborating with other people. It will be a challenge to learn to use all the tools that will be presented by the end of this session. I'd like to think that I'll continue to be a lifelong learner as far as ICT is concerned (personal communication, IMYM pilot teacher, August 26, 2003).

3.4.2 Day 2: Wednesday, August 27, 2003

Day 2 had four segments. Segment one began with a reminder of what was learned on Day 1 and then continued with a jigsaw strategy around the five IMYM Professional Learning Centres (see Section 2.7). The pilot teachers organized themselves into five groups of two or three, with teachers they had not yet worked with. Each group participated in and discussed one of the five IMYM Learning Centres (Collaboration, Independent Learning, Authentic Assessment, Interdisciplinary Approach, and IMYM Classroom Set-up). The objective of this task was to have each group work through a Learning Centre and then share with the other groups their findings on the characteristics of the IMYM model. This task modeled OLE.5 *Share the Learning* where the learning objective is to share what is being learnt with others.

Segment two allowed pilot teachers to familiarize themselves with the structure of the *Climate Change* interdisciplinary unit (e.g., OLEs, ICTs, and Modules 1-4). This task correlates with Module 1.1 *The Big Picture*, where teachers identify the importance of citizenship, their roles and responsibilities as global citizens, and aspects of sustainable development with their students. Collaboration, networking, becoming more familiar with the *Climate Change*

interdisciplinary unit and with the IMYM model were all designed to prepare the teachers for their pilot experience.

The Jigsaw Learning Centre on the *Climate Change* interdisciplinary unit was the third segment of Day 2. To make this task manageable and to model the IMYM characteristic of collaborative learning, pilot teachers were divided into six groups. Each group examined one component of the *Climate Change* interdisciplinary unit and created a PowerPoint presentation to introduce that component to the whole group. Teachers researched the following questions.

- What is the overview of the component?
- When in the school year is the component completed?
- What are students doing in the learning experiences of the component?
- What connections are there to the culminating performance task of the *Climate Change Awareness Week*?

As a classroom management strategy, the ICT self-assessment rubrics that were previously completed by the pilot teachers were used to identify six teacher participants with enough PowerPoint experience to act as 'group encouragers', or peer mentors. This task models ICT.8 *Make Your Point* where the learning objective is to create multimedia presentations and OLE.6 *Collaborative Learning* from the interdisciplinary unit where the objective is to experience roles, responsibilities, and expectations of collaborative group work.

The fourth segment of Day 2 was learning how to use the *Sharing Centre* within the IMYM Online Learning Community. After a demonstration, each group uploaded their group IMYM PowerPoint presentation to the *Sharing Centre*. Becoming familiar with the *Sharing Centre* was important so that pilot teachers would have the skills necessary to share student samples and classroom photos with each other throughout the pilot.

The IMYM *Climate Change* pilot teachers were asked to fill in an exit slip evaluating their learning experiences on Day 2. There were a total of six statements in which they were asked to respond to.

1. My participation in the learning centres on the IMYM model helped increase my understanding of the 5 characteristics of the IMYM classroom – interdisciplinary learning, use of learning centres, collaborative learning, authentic assessment, and flexible classroom setup.
2. After participating in the Delving Deeper ‘fill-in-the-blanks’ task, I feel more confident in my understanding of the structure and content of the 6 components of the *Climate Change* interdisciplinary unit.
3. Through the demonstrations and my hands on use of *Inspiration*, I feel prepared to use concept mapping software with my students this year.
4. I am becoming more comfortable with my role as a pilot teacher.
5. I am beginning to feel like part of the IMYM Learning Community.
6. I believe I will be able to give and receive help during this IMYM pilot through use of the IMYM Online Learning Community.

For question 1, six of the fifteen respondents significantly agreed while eight greatly agreed that their knowledge of the five characteristics of the IMYM classroom has increased due to their participation in the various learning centres. For question 2, twelve of the fifteen respondents said that they were not at all confident of the six components of the *Climate Change* interdisciplinary unit. For question 3, seven of the fifteen respondents significantly agreed while seven greatly agreed that they felt prepared to use concept mapping software such as *Inspiration* in the pilot study. For question 4, ten of the fifteen respondents significantly agreed while two greatly agreed that they were feeling more comfortable with their role as a pilot teacher. For question 5, nine of the fourteens respondents greatly agreed while four significantly agreed that they felt part of the IMYM Learning Community. For question 6, seven of the fourteen respondents significantly agreed while five greatly agreed that they were able to give and receive help through the use of the IMYM Online Learning Community.

After completing the exit slips, the pilot teachers were given homework. The homework was to use their digital camera (ICT.7 *Caught In Action*) to collect images that would represent some aspect of climate change (e.g., weather phenomena, clouds, recycling, energy conservation, transportation, appliances, etc.). The purpose of this task was to assist the pilot teachers in learning more about their digital camera while also getting them to start a collection of copyright-free digital images to share through the *Sharing Centre*. This collection will eventually be made available to all Grade 5 teachers implementing the *Climate Change* interdisciplinary unit.

Following is a comment some of the IMYM pilot teachers concerning their experiences on Day 2.

The materials and information available for use on the Climate Change interdisciplinary unit will be invaluable to me as a first year Grade 5 teacher...this year especially. The IMYM model is very new to me and will require time to process and reflect on how I can change current practices to integrate this new standard of educational thinking. I have learned and will continue to learn much more, I know, on the IMYM Online Learning Community in particular, and technology in general. I am looking forward to planning and implementing this project at school. I will be working with students that are known to me from last year and think that they will enjoy the learning opportunities that the IMYM model will present (personal communication, IMYM pilot teacher, August 27, 2003).

Today was a little overwhelming with all the info, but I am keeping an open mind and ready to continue learning (personal communication, IMYM pilot teacher, August 27, 2003).

It was another great day. I felt my head go under water a few times, but I didn't run out of breath. I'm very excited about starting this unit. I need to get a few more things organized in my head first, but I know there's a great support team to help out (personal communication, IMYM pilot teacher, August 27, 2003).

Great day ladies. Loved the hands-on activities. Yes I am beginning to feel the impending pressure on the work load (personal communication, IMYM pilot teacher, August 27, 2003)

I am very excited about working on this unit with my students and these professionals. I am also interested to see how Web CT allows the teacher participants to work collaboratively compared to past pre web ct IMYMs. Thanks for the opportunity (personal communication, IMYM pilot teacher, August 27, 2003).

3.4.3. Day 3: Thursday, August 28, 2003

Day 3 was the last day of the face-to-face professional learning orientation. After welcomes and a review of what was learned the previous day, each group assessed the different resources provided on their *Climate Change* CD-ROM. The pilot teachers accessed either *Hot Potato* or the *Millionaire Game* in order to create a game with the climate change facts that they had gathered the previous day. This task relates to two *Climate Change* learning experiences: M2.4 *Sharing the Consequences* where the learning objective is to create poster and games that share the consequences of climate change and M3.6 *We All Can Make a Difference* where the learning objective is to collect previous work already completed and then create products to educate others about how we all can work together make an impact on climate change.

Next, the IMYM pilot teachers learned about creating a personal web page. This task models ICT.11 *Making It* which learning objective is to create a Scavenger Hunt and a class website. The pilot teachers then watched a brief demonstration on how to download a zip file from the IMYM Online Learning Community and upload it to the *Sharing Centre*. Then the pilot teachers learned how to “un-zip” a file within WebCT.

The next assigned task was designed to help the pilot teachers take a closer look at the *Climate Change* interdisciplinary unit. This was done by using "fill-in-the-blanks" concept map to visualize the structure of the six components. Each concept map for OLE, ICT and Modules 1-4 has the main idea in the centre and a symbol for each learning experience linked to it (see Figure 3). On each symbol is the title of the learning experience. Each learning experience has a

symbol that links to a learning objective. Working in pairs, the pilot teachers examined the *Climate Change* learning experiences to gather the information needed to fill in the blanks on each of the six concept maps using their concept mapping software. This task provided practice in using *Inspiration* (ICT.6 *Inspired*) while forming a clearer understanding of the structure and content of the *Climate Change* interdisciplinary unit (see Appendix H for all concepts maps).

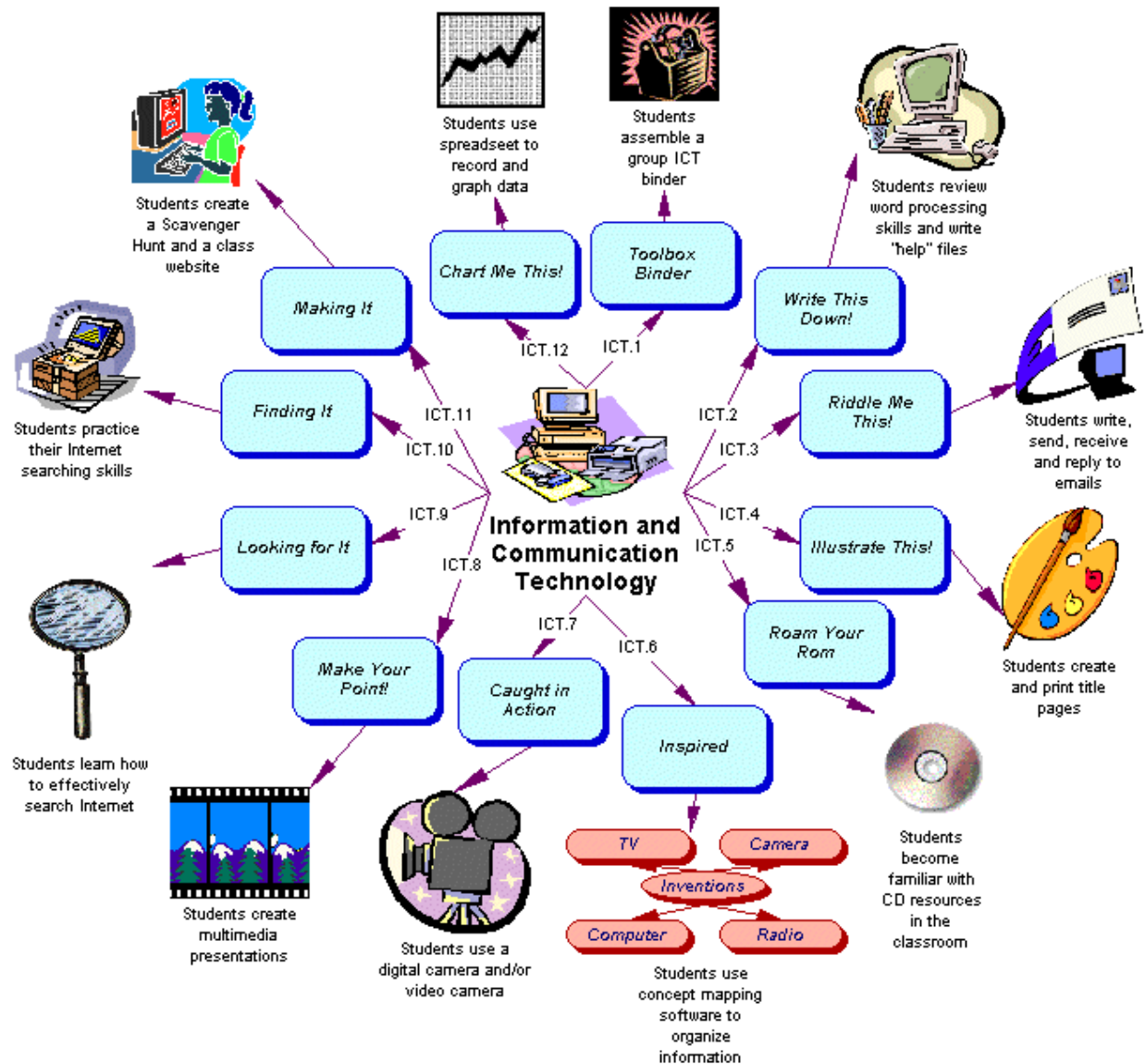


Figure 3: Concept Map of ICTs

The pilot teachers then independently completed a *Scavenger Hunt* in order to learn more about the *Climate Change* interdisciplinary unit and the resources available to them and their students. This task modeled a strategy from learning experience ICT.10 *Finding It: Internet Scavenger Hunt*; the learning objective being to improve Internet searching skills.

One incentive for becoming an IMYM pilot teacher was receiving a digital camera for classroom use. Therefore, the pilot teachers needed to learn how to use the digital camera and the accompanying software. A demonstration illustrated how to install the digital camera software (*Zoombrowser EX*), how to download images from the digital camera to a computer, how to re-size images for the Internet or email, and how to upload digital images to the *Sharing Centre* within the IMYM Online Learning environment. These tutorials were also provided in the online *Techie Toolkit*.

During the IMYM professional learning sessions, no task was complete unless *Share the Learning* occurred (OLE.5 *Share the Learning*). To share the learning for this task, the pilot teachers

- installed the digital camera software
- connected the digital camera to the computer
- uploaded and re-sized the digital images they had taken from their assigned homework to the *Digital Images* folder in *Share the Learning*
- sent an email to the IMYM project leader describing the location of the image, the file name, and how they thought it could be used in the *Climate Change* interdisciplinary unit
- accessed the other pilot teachers' digital images from the *Sharing Centre*.

The pilot teachers were also reminded of their role and responsibilities to

- Contribute – to the IMYM Online Learning Community
- Experiment – with the IMYM Model and the *Climate Change* Interdisciplinary Unit
- Discuss – with other pilot teachers
- Share – student samples and digital photographs
- Reflect – on their own learning, professional relationship, and classroom changes

- Provide Feedback – by completing online Exit Slips at the end of each *Climate Change* learning experience.

The final portion of Day 3 was dedicated to reflecting on the last three days, discussing what was learned, planning for the pilot in terms of re-structuring their classrooms, getting started, and so forth. The IMYM *Climate Change* pilot teachers were asked to fill in an exit slip at the end of Day three. They responded to five statements.

1. After uploading my digital picture, I now know how to share my student samples through the IMYM Online Learning Community.
2. Through the Learning Resources Jigsaw task, I feel I have an understanding of the variety of print, software, and online learning resources available to me for the *Climate Change* pilot.
3. After participating in the Learning Resources Jigsaw *Share the Learning*, I now know how to conduct an Electronic Gallery Walk using *Inspiration*.
4. After charging the batteries, taking some pictures, and using the digital camera software, I am confident that I can use my new digital camera to take pictures that represent some aspect of climate change, such as weather phenomena, clouds, recycling, energy conservation, etc.
5. After completing this ‘quiz’, I am prepared to answer similar ‘quizzes’ following the completion of each *Climate Change* learning experience.

The possible answers included not at all, slightly, significantly, and greatly agreed. For question 1, eleven of the thirteen respondents slightly agreed that they would know how to share their student samples through the IMYM Online Learning Community. For question 2, eight of the twelve respondents significantly agreed and three greatly agreed that they understand the variety of print, software and online learning resources available to them in the IMYM *Climate Change* pilot study. For question 3, six of the thirteen respondents greatly agreed while five significantly agreed that they knew how to use the software *Inspiration* at the end of Day 3 of the orientation. For question 4, eleven of the thirteen respondents greatly agreed that they could use their digital cameras while for question 5, eight of the thirteen respondents greatly agreed and four significantly agreed that they were prepared to complete similar “quizzes” in the future.

After completing the final exit slip, the pilot teachers went in separate directions around the province to begin the *Climate Change* pilot study at their respective schools. Here are some comments from IMYM pilot teachers on the final day of the orientation.

It has been a great three days...a little heavy near the end of each day. Good luck everyone! I now have to process all this information and plan for day 1 Sept. 3. Thanks. (personal communication, IMYM pilot teacher, August 28, 2003).

This has been really fun! I am looking forward to getting started. Thanks again for everything. (personal communication, IMYM pilot teacher, August 28, 2003)

There is a lot to learn but I am eager to become more knowledgeable in technology (personal communication, IMYM pilot teacher, August 28, 2003).

This is a lot of information to process. I am less anxious about certain things; I am more confident and ready to try things out. I am positive that things will fall into place once I start using the information (personal communication, IMYM pilot teacher, August 28, 2003).

3.4.4 Follow-Up: Monday, February 23, 2004

The follow-up was scheduled for February 23, 2004, and mirrored the same format as the August 2003, professional learning sessions. The four themes (e.g., the IMYM model, the *Climate Change* interdisciplinary unit, the IMYM Online Learning Community, and the ICT integration) were discussed and analyzed in order to determine changes that were needed. A *Carousel Brainstorm* was conducted, where the pilot teachers broke into focus groups and recorded on a piece of chart paper that was labeled at the top with one of the four themes. Each group of pilot teachers wrote a sentence description of the assigned theme using a different coloured marker. Below their description, they drew a t-chart with “Successes” written on the left side and “Challenges” written on the right side. To make this brainstorming activity a “carousel”, each chart was passed clockwise to the next group in order for new ideas to be added. As the charts were passed, it was easy to see the ideas contributed by each colour group. The results of are detailed in Section 4.3.5.

The second task for each individual pilot teacher was to complete a concept map of what their IMYM classroom, looked, felt and sounded like. These concept maps were later compared to and contrasted with the concept maps completed in the August 2003 orientation (see page 30-31). After this was complete, the pilot teachers entered a discussion topic in the IMYM Online Learning Community and provided advice to future IMYM *Climate Change* teachers. Here are is a list of advice from some of the IMYM pilot teachers

- Take time to review the interdisciplinary unit.
- Choose the ICTs and OLEs you'd like to do with your students and teach them prior to starting the Modules.
- Do not feel that you have to complete every learning experience in the entire unit.
- Keep in touch with an IMYM teacher that has completed the unit.
- Have a back up activity in case of technology problems.
- Have a few ongoing activities so that students always have something they can keep involved in when they have completed given assignments.
- Do some teacher-direct instruction and/or individual work whenever you feel it is needed.
- Have a good filing system, so you know where to find everything.
- It is a LOT of work, but it's also a GREAT experience.
- Be part of a team. If you feel a bit overwhelmed or lost at first, you're just like everyone else and you'll do fine.
- You'll learn more about the all the curriculums than you ever thought possible.
- Look ahead in the pilot unit as much as you can, but mostly, you just have to jump right in and do it.
- Improve your computer skills while you teach the kids how to use the programs.
- One of the best pieces of advice I can give you is to use the IMYM Online Learning Community. It's a great way to see what others are doing and you can get and give help to others who are in the same boat as you.
- The camera is very cool. The kids will love it and so will you. There are thousands of things you can do with it.
- Learn about weather before you begin this pilot.
- Learn about the digital camera and PowerPoint so you can teach these to the children right away
- Find out in advance where your support is going to be (i.e., is there money for color cartridges? printing? guests? trips?).
- Don't try to do all of the activities. Pick the ones that you are comfortable with and prepare them at least a week in advance.
- Check the IMYM Online Learning Community at least once a week.
- Try to figure out what is expected before you begin each learning experience.
- Know your students before you begin grouping them.

- Be fair with assessment and recognize the hard workers in each group.
- Give a mini workshop at a staff meeting so that the other teachers have a sense of what is going on.
- Get the kids out and into the environment as much as possible don't keep them at a computer.
- Have the kids teach other kids the skills that they have acquired.
- Be flexible... Teach the kids to be flexible.
- Ask the librarian to help you find and locate resources. Do this in advance so that you can just turn to the materials when needed.
- Keep a lookout for related activities (i.e. PolarHusky.com has a team of dogsledders who are traveling from Yellowknife to Nunavut in search of climate change evidence and interviews with the elders. They have set it up for teachers to log on with their classrooms).
- NASA is great for what is happening now with satellite photos.

The pilot teachers then took some time to reflect on how they as teachers, their classrooms and their relationships with colleagues changed over the course of the pilot study. The results of this are detailed more extensively in this report (see Section 4.4). When reflecting on themselves as teachers, the pilot teachers answered the following questions: What content and skills am I learning? What am I learning about myself as a teacher? How is my role as a teacher changing? When reflecting on their classroom, the pilot teachers answered these questions: How is my classroom changing physically and functionally? What is the impact of IMYM on my classroom practice? How are my students responding? Finally, when reflecting on relations with colleagues, the pilot teachers answered these questions: In what ways am I collaborating with other teachers? How am I mentoring my colleagues?

The pilot teachers formed groups to analyze the qualitative data retrieved from discussions in the IMYM Online Learning Community which was categorized into the four major themes. This was an opportunity for some of the pilot teachers to review what was discussed throughout the various threaded discussions.

One of the final tasks was a review and analysis of the OLEs, ICTs and Modules 1-4 to determine if any changes or deletions needed to be made for next years' teachers. The pilot teachers were asked in an open forum to answer the following questions (results in Section 4.3.5)

- What are the challenges in physically 'remodeling' your existing classroom into an IMYM classroom? What are the advantages?
- What are the challenges you found in combining outcomes from more than one subject area into a real world context? What are the advantages?
- How did you scaffold (provide support and gradually withdraw it) for your students in their development of collaborative learning skills? What behaviours did you observe that tell you that your students are becoming better collaborative learners?
- Why do you think it is important to take on more of a role as a 'facilitator and co-learner', rather than an 'expert giver of knowledge'? How did your use of learning centres provide the structure needed to transfer an appropriate amount of responsibility for their learning to your students?
- How are you expanding your own repertoire of assessment techniques and strategies to make them more 'authentic'? How are you meeting the challenges of accurate assessment of collaborative and interdisciplinary products and processes? In what ways have you assured your students' parents that authentic assessment is a valid and reliable indicator of their child's progress?
- Which LEs should we keep or remove?
- How should we change the LEs we are keeping?
- What are your strategies for use of the IMYM Online Learning Community to support you during your pilot?
- How can support provided by the IMYM Online Learning Community be made more effective for future IMYM teachers?

The last task of the day was the opportunity for the pilot teachers to share their successes with their colleagues. Teachers brought student samples, classroom photographs (see Appendix I), *Climate Change* Awareness event materials, teacher materials they had created, a link to their classroom website, videotapes of their students, and show-and-tell presentations. Many of the pilot teachers commented how helpful it was to see what the other teachers had done and how that sharing inspired them to do something similar next year.

4.0 Results

There is a substantial amount of both qualitative and quantitative data from the *Climate Change* pilot study. This data was retrieved from the self-assessment rubrics, exit slips, online feedback forms, online reflection journals, and feedback received at the follow-up session in February 2004.

4.1 Teacher Self-Assessment Rubrics

Two self-assessment rubrics were completed by the pilot teachers both before and after the pilot study. The first rubric is a self-assessment of pedagogical skills in integrating ICT with curriculum and classroom practice and the second rubric is a self-assessment of ICT literacy. Each rubric consists of descriptors of Beginning, Developing, Accomplished and Exemplary stages for each skill category (see Appendices A and B).

The *Pedagogical Skill in Integrating ICT with Curriculum and Classroom Practice* (see Appendix A) has ten ICT skills including

- using educational software
- using ICT to improve student writing
- teaching information literacy skills using resource-based learning
- teaching information literacy skills using primary sources
- differentiated instruction
- assessing student performance
- using technology for professional research and communication
- researching and evaluating the use of technology in education
- engaging in online professional learning
- setting up an IMYM classroom.

The *Self-Assessment of ICT Literacy* rubric has seventeen ICT skills (see Appendix B) including

- computer operation
- file management

- networking
- word processing
- spreadsheet
- database
- concept mapping
- graphics and animation
- CD-ROM inquiry
- Internet inquiry
- web page creation
- email
- multimedia
- digital Imaging
- videography/video editing
- Geographical Information Systems (GIS)
- Electronic data collection.

The self-assessment rubrics were completed at the August 2003 professional learning session as well as at the February 2004 follow-up session. For various reasons and circumstances, only eleven of the fifteen pilot teachers were able to complete the self-assessment rubrics both in August and in February. The results follow in graphical form.

4.1.1 Pedagogical Skill in Integrating ICT with Curriculum and Classroom Practice

Eleven of the fifteen pilot teachers completed the self-assessment rubrics of ICT integration in both in August 2003 and in February 2004. The data from these eleven pilot teachers are displayed in a double bar graph in order to demonstrate teachers' self-improvement of their skills between the two dates. The descriptions of the stages of each ICT integration skill are found in Appendix A.

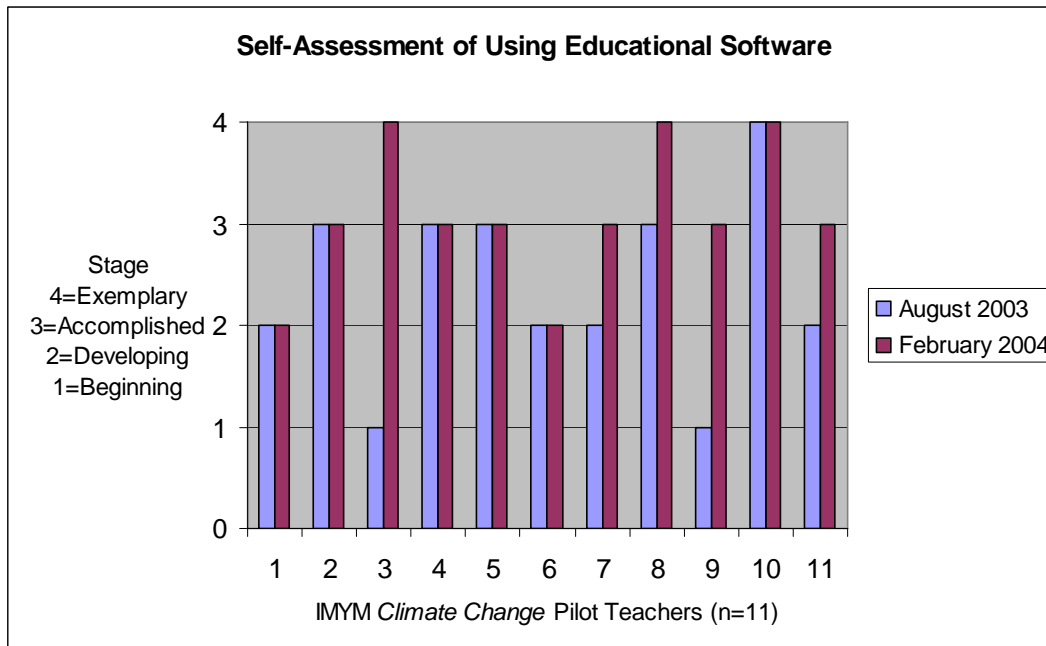


Table 2: IMYM Climate Change Pilot Teachers: Self-Assessment Using of Educational Software

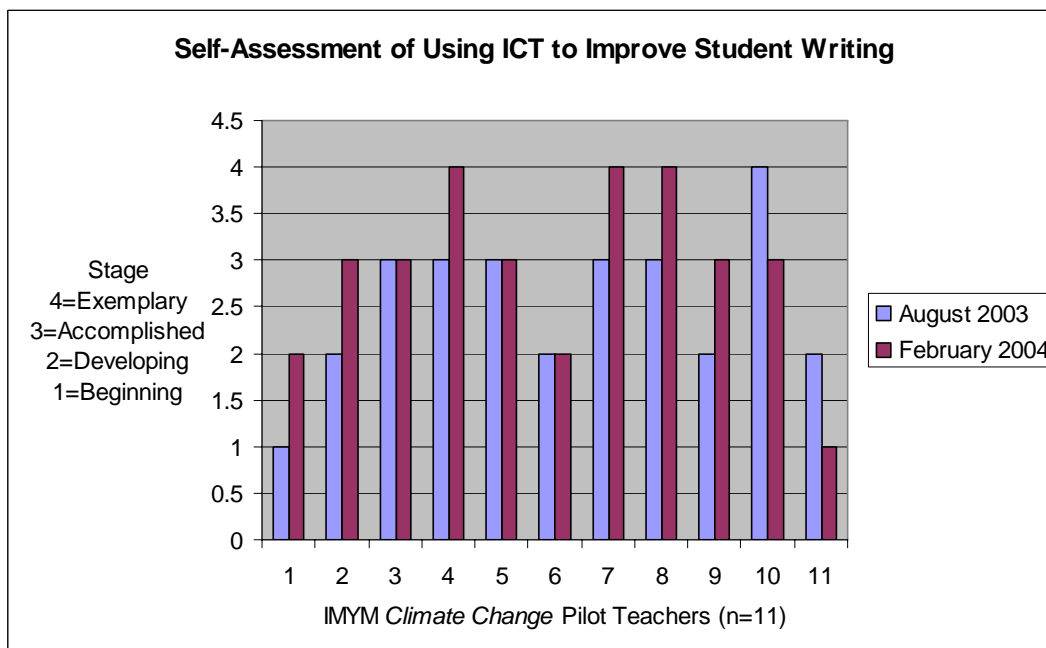


Table 3: IMYM Climate Change Pilot Teachers: Self-Assessment Using ICT to Improve Student Writing

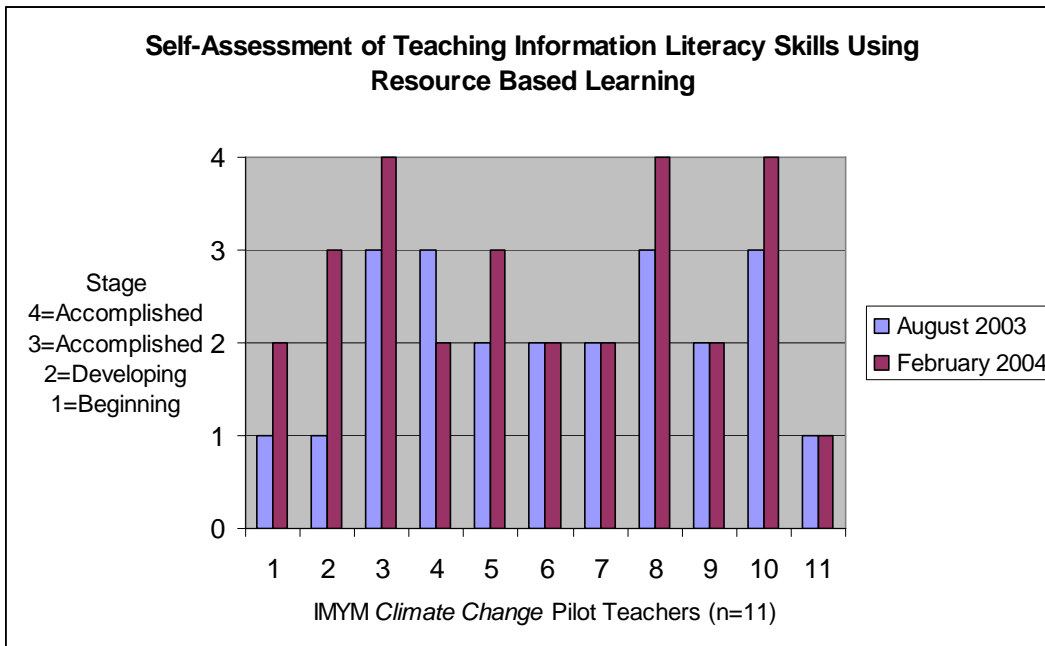


Table 4: IMYM Climate Change Pilot Teachers: Self-Assessment of Information Literacy Skills Using Resource Based Literacy

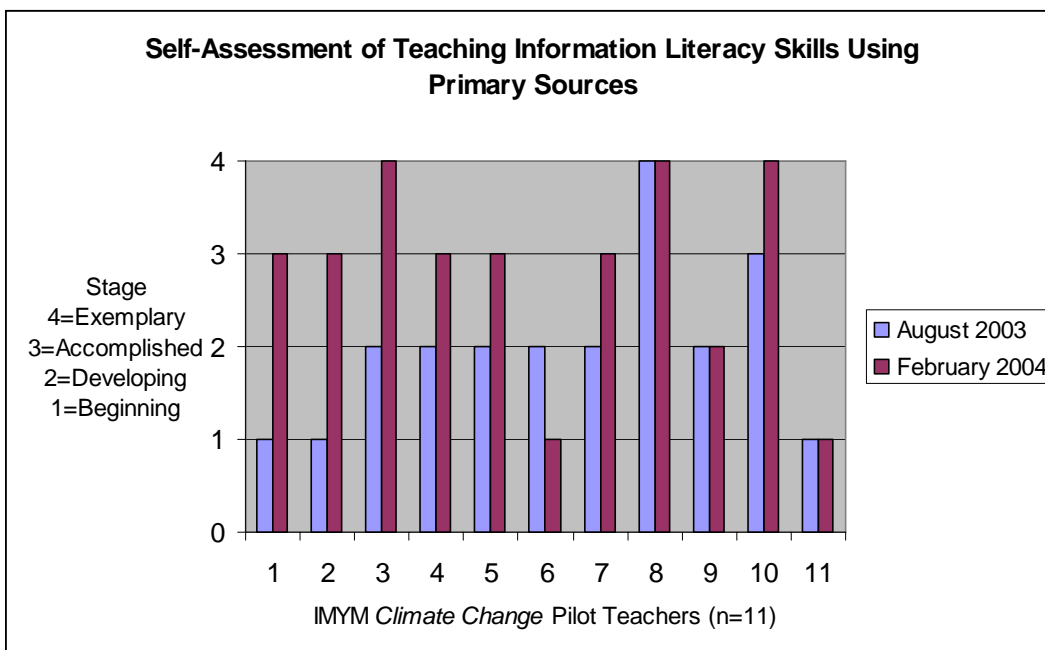


Table 5: IMYM Climate Change Pilot Teachers: Self-Assessment of Teaching Information Literacy Skills Using Primary Sources

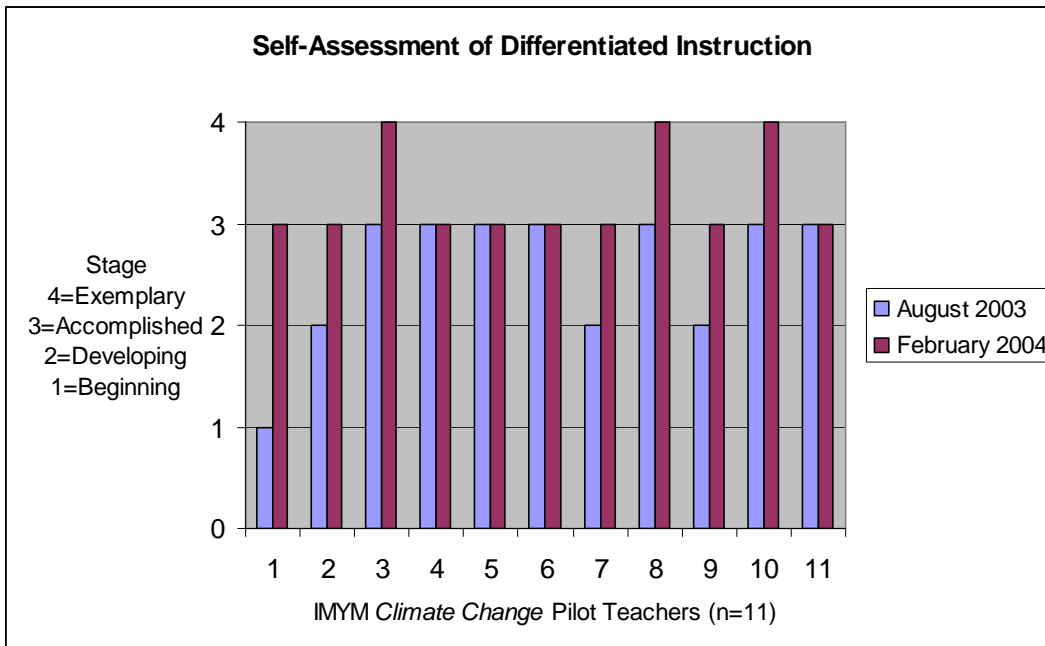


Table 6: IMYM Climate Change Pilot Teachers: Self-Assessment of Differentiated Instruction

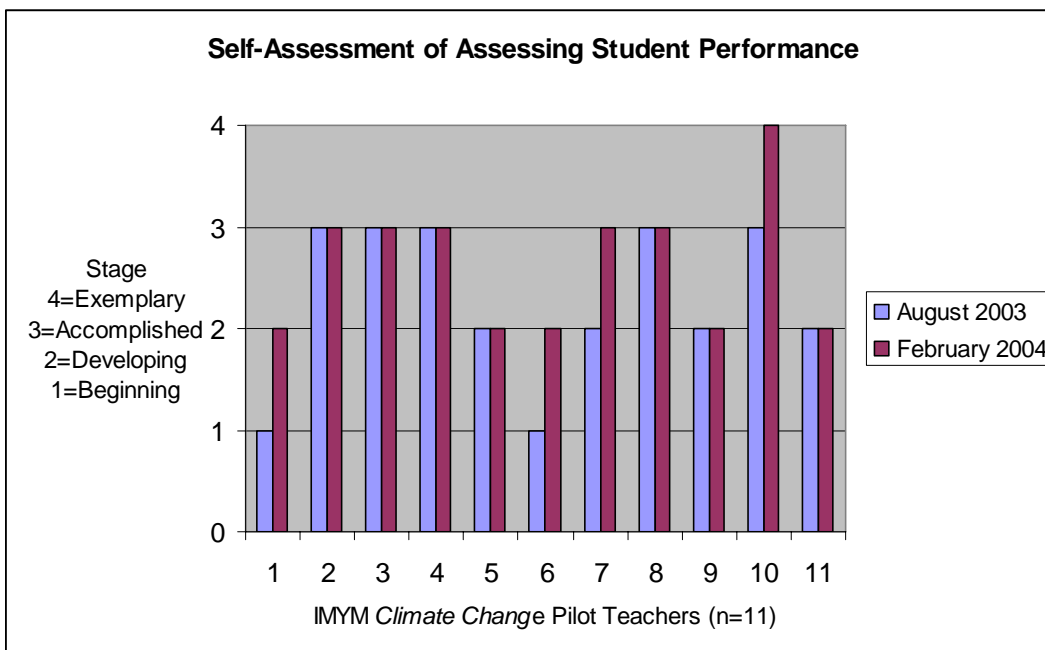


Table 7: IMYM Climate Change Pilot Teachers: Self-Assessment of Student Performance

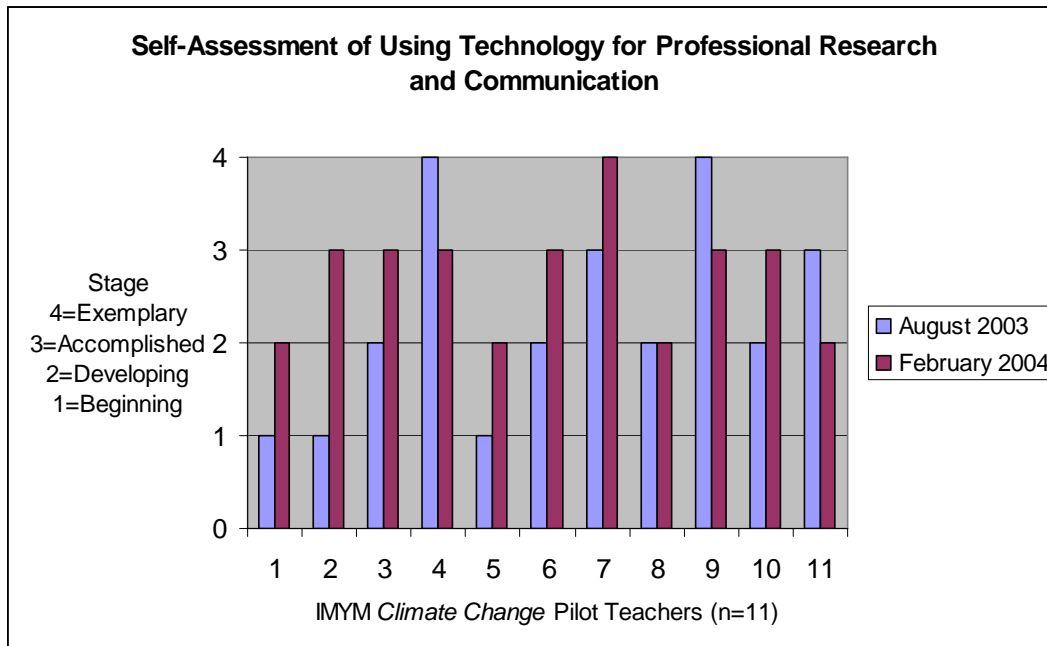


Table 8: IMYM Climate Change Pilot Teachers: Self-Assessment of Using ICT for Professional Research and Communication

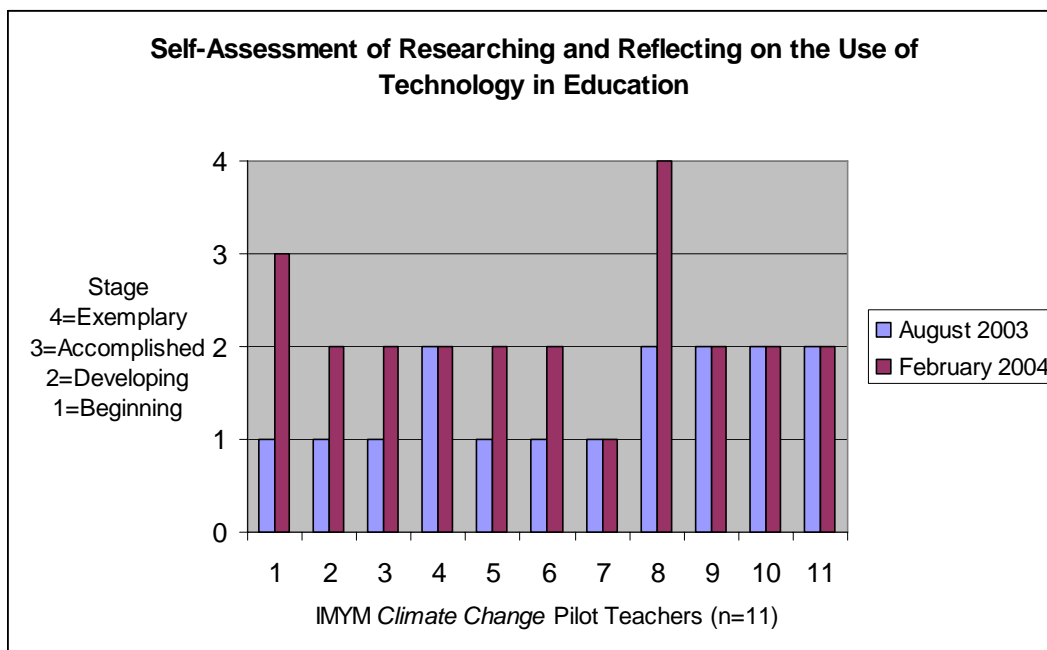


Table 9: IMYM Climate Change Pilot Teachers: Self-Assessment of Researching and Reflecting the Use of Technology in Education

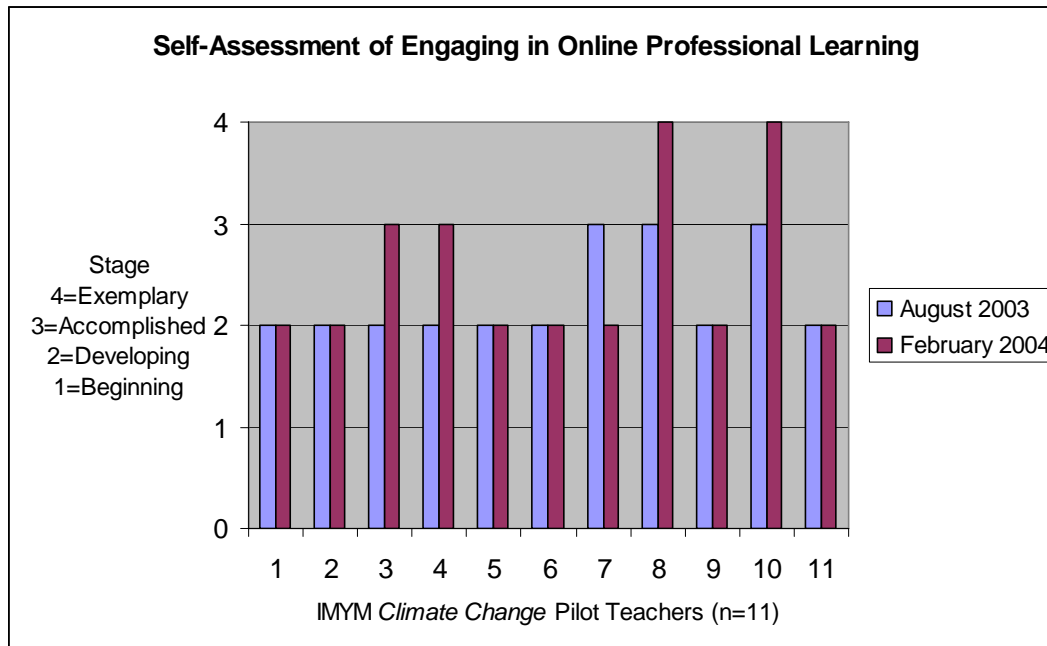


Table 10: IMYM Climate Change Pilot Teachers: Self-Assessment Engaging in Online Professional Learning

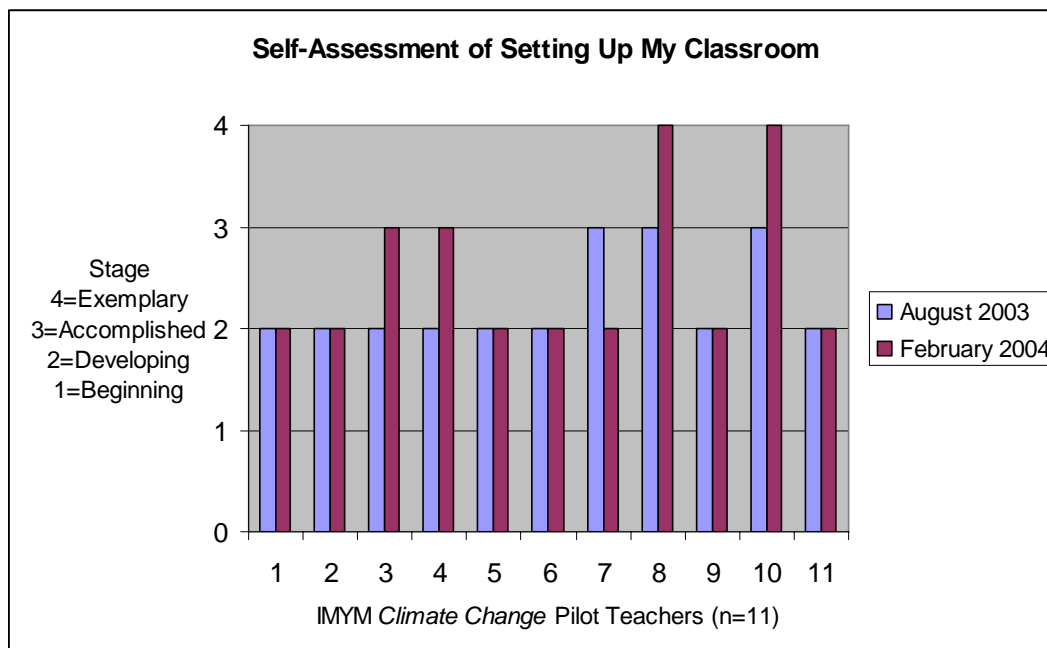


Table 11: IMYM Climate Change Pilot Teachers: Self-Assessment Setting Up My Classroom

Overall, there was improvement in the IMYM Climate Change pilot teachers' self-assessment of their pedagogical skill in integrating ICT.

4.1.2 Self-Assessment of ICT Literacy

Eleven of the fifteen pilot teachers completed the self-assessment rubric on ICT literacy in both in August 2003 and in February 2004. The data from these eleven pilot teachers are displayed in a double bar graph compare teachers' self-assessment of their skills between the two dates. The descriptors of the stages of each ICT skill are found in Appendix B.

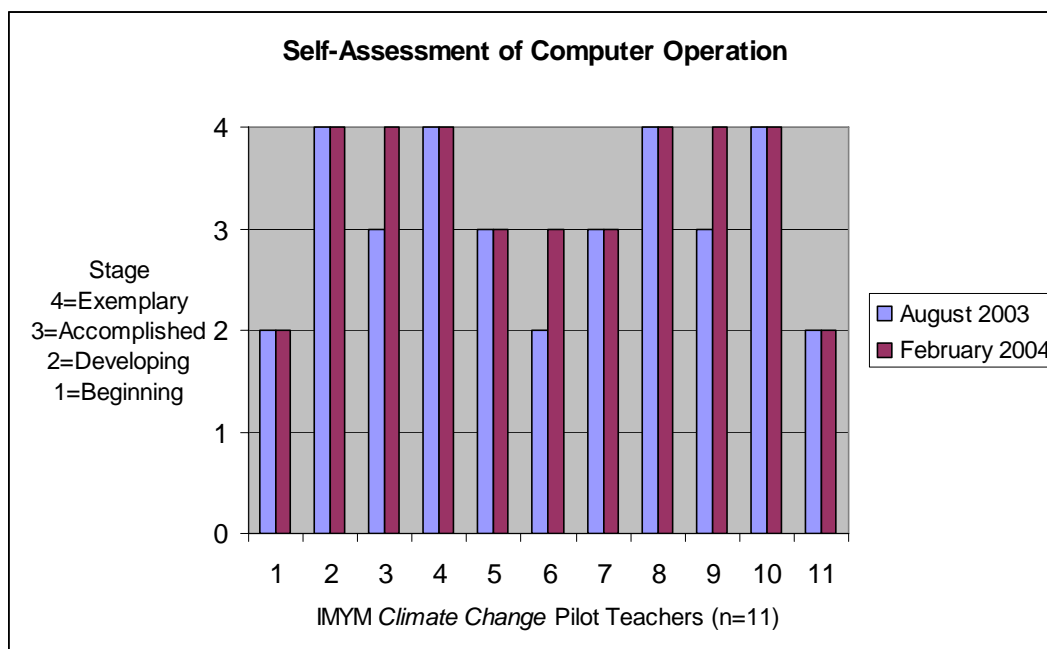


Table 12: IMYM Climate Change Pilot Teachers: Self-Assessment of Computer Operation

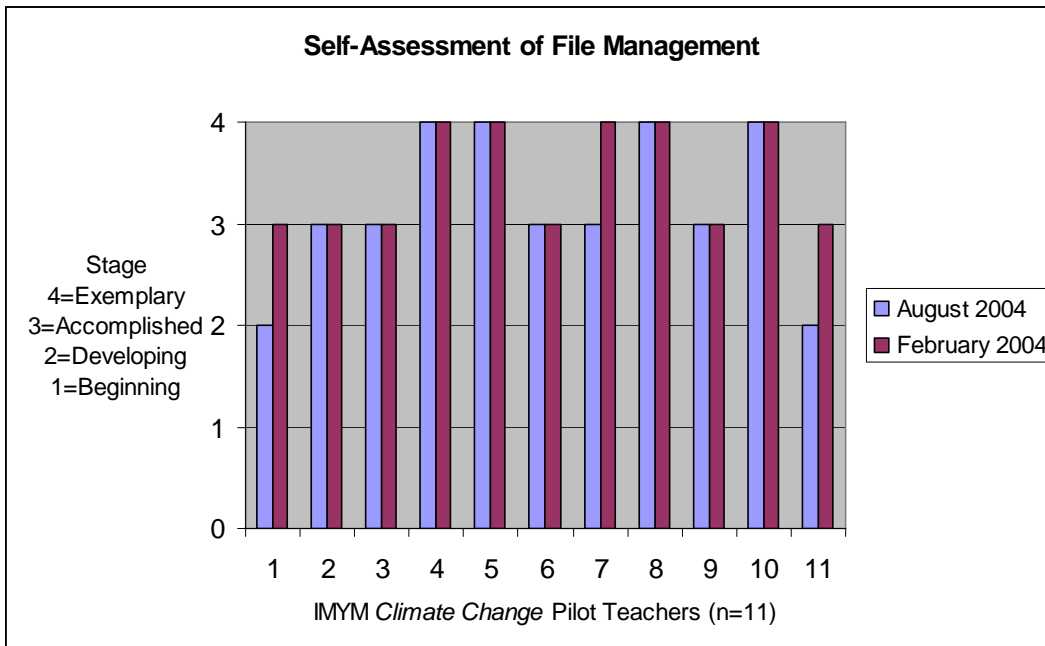


Table 13: IMYM Climate Change Pilot Teachers: Self-Assessment of File Management

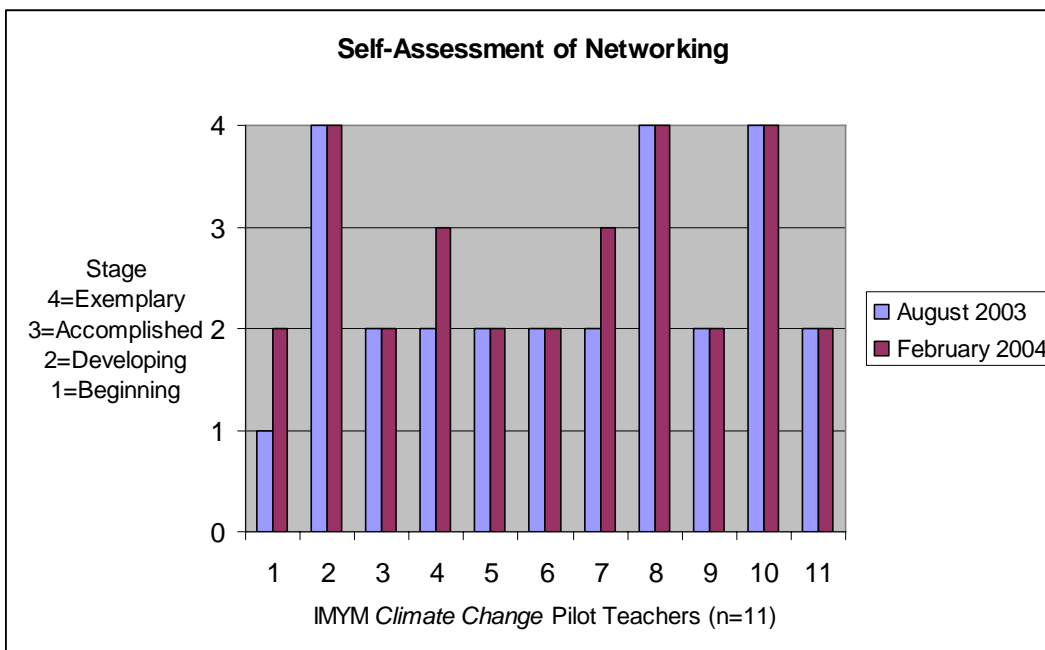


Table 14: IMYM Climate Change Pilot Teachers: Self-Assessment of Networking

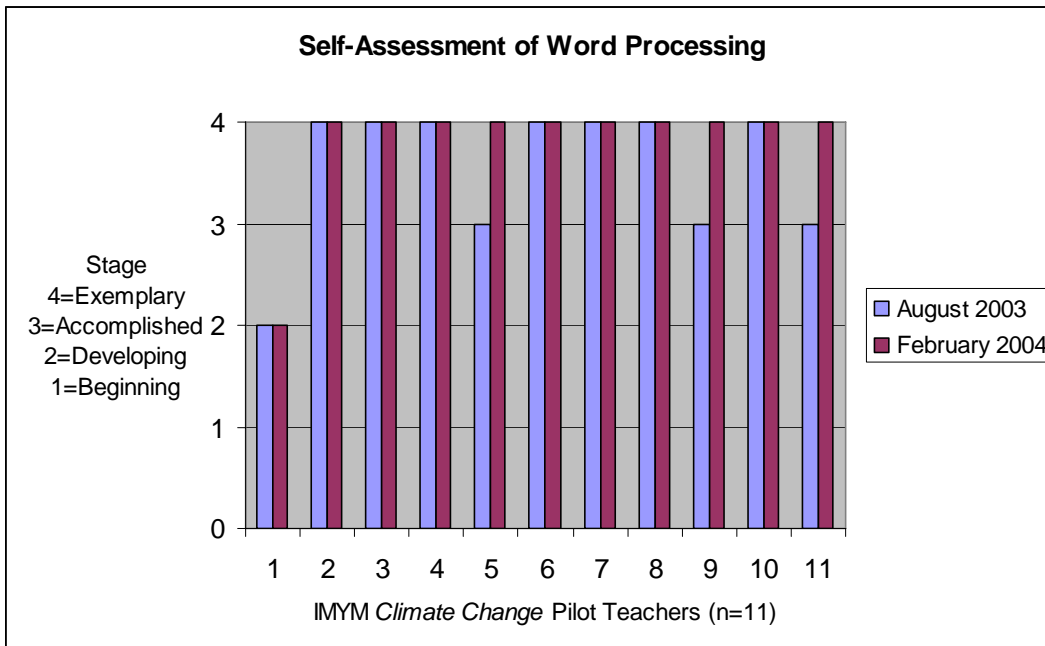


Table 15: IMYM Climate Change Pilot Teachers: Self-Assessment of Word Processing

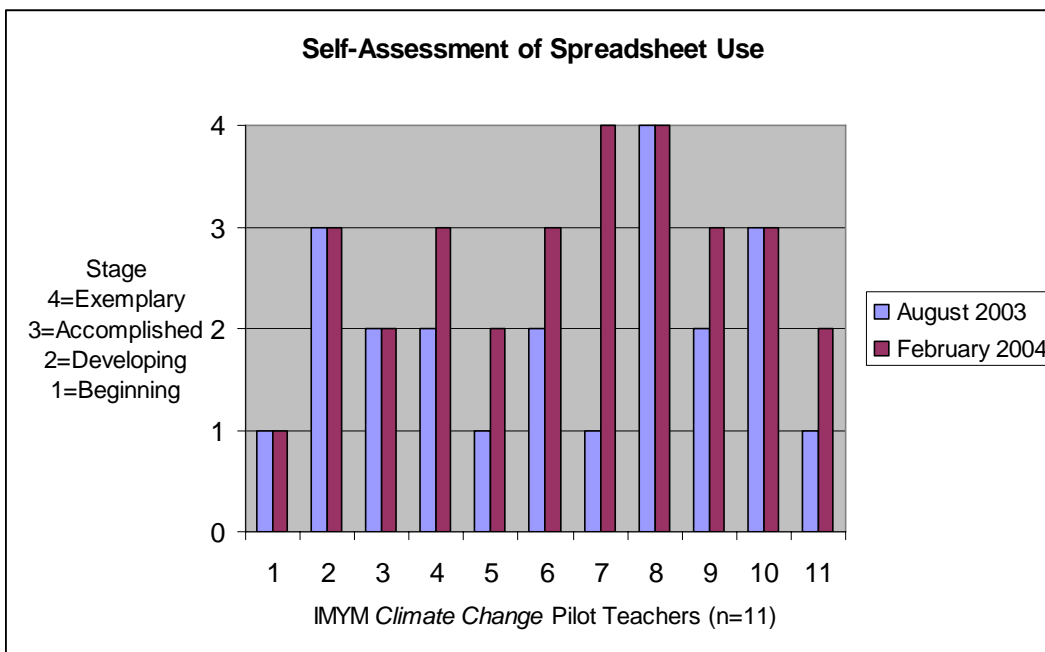


Table 16: IMYM Climate Change Pilot Teachers: Self-Assessment of Spreadsheet Use

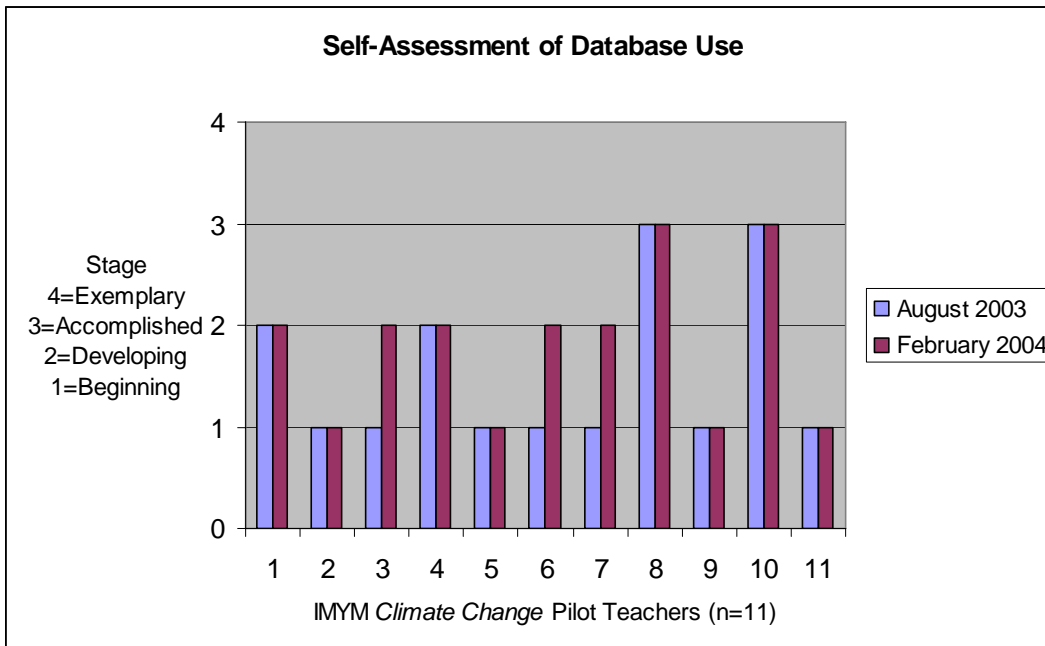


Table 17: IMYM Climate Change Pilot Teachers: Self-Assessment of Database Use

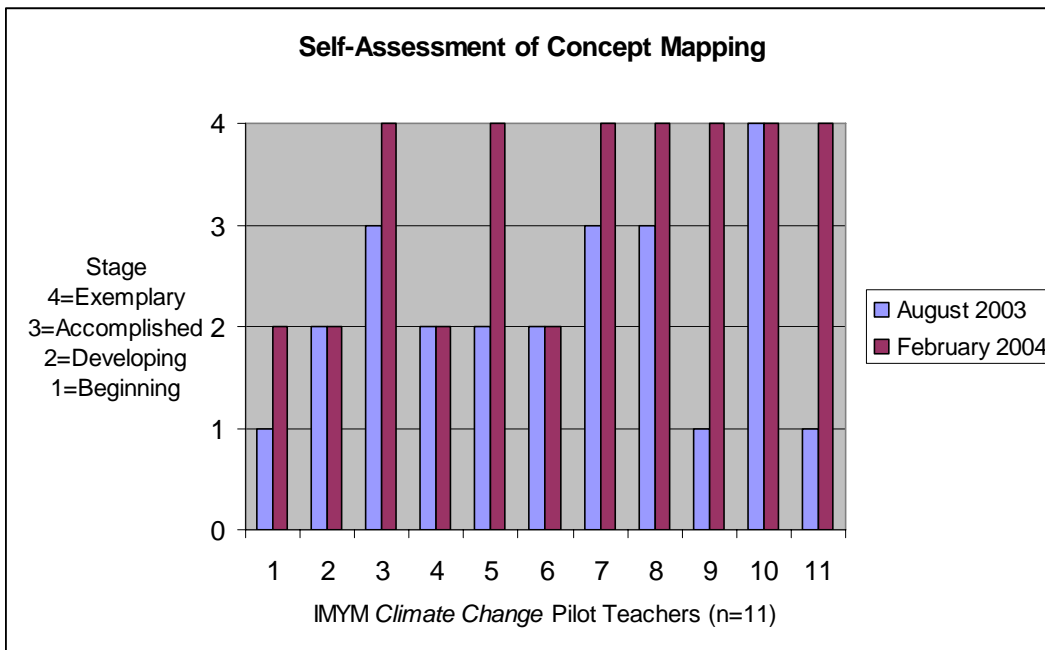


Table 18: IMYM Climate Change Pilot Teachers: Self-Assessment of Concept Mapping

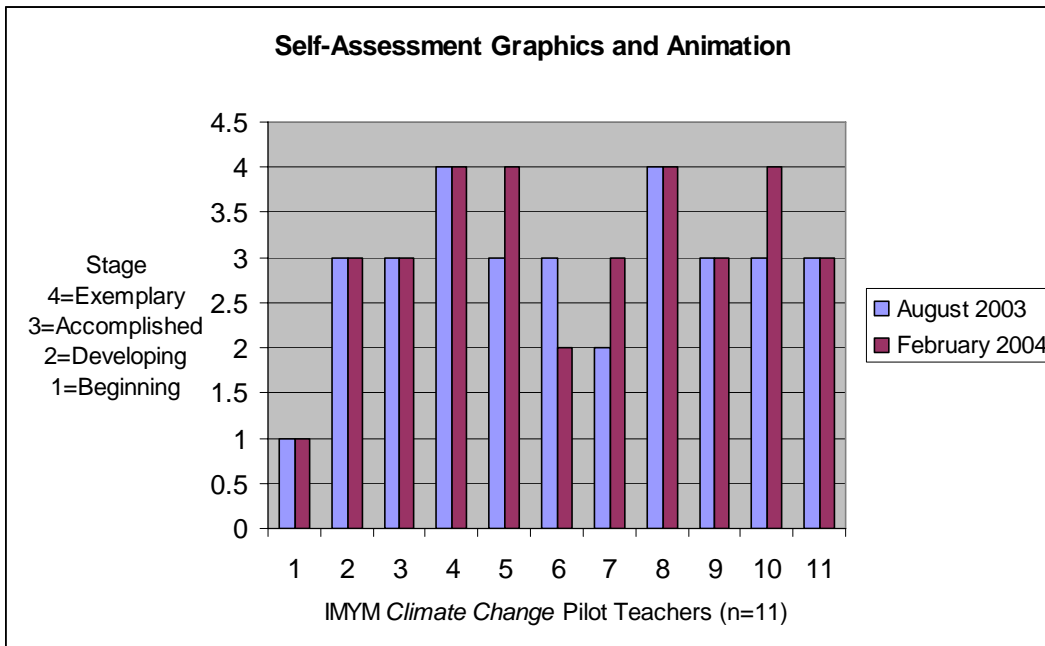


Table 19: IMYM Climate Change Pilot Teachers: Self-Assessment of Graphic and Animation

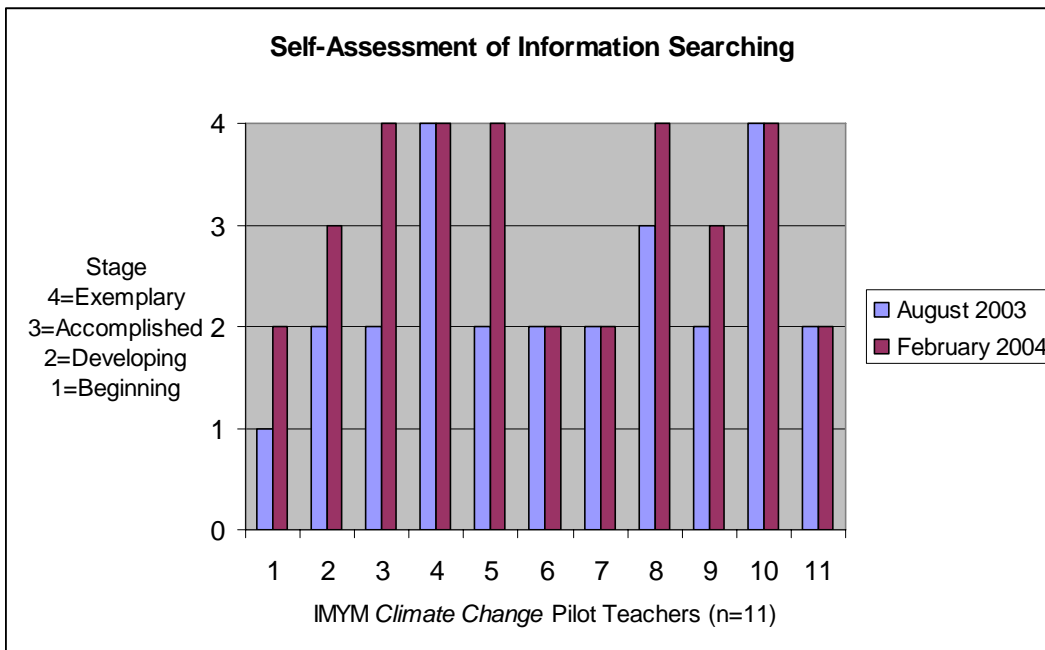


Table 20: IMYM Climate Change Pilot Teachers: Self-Assessment of Information Searching

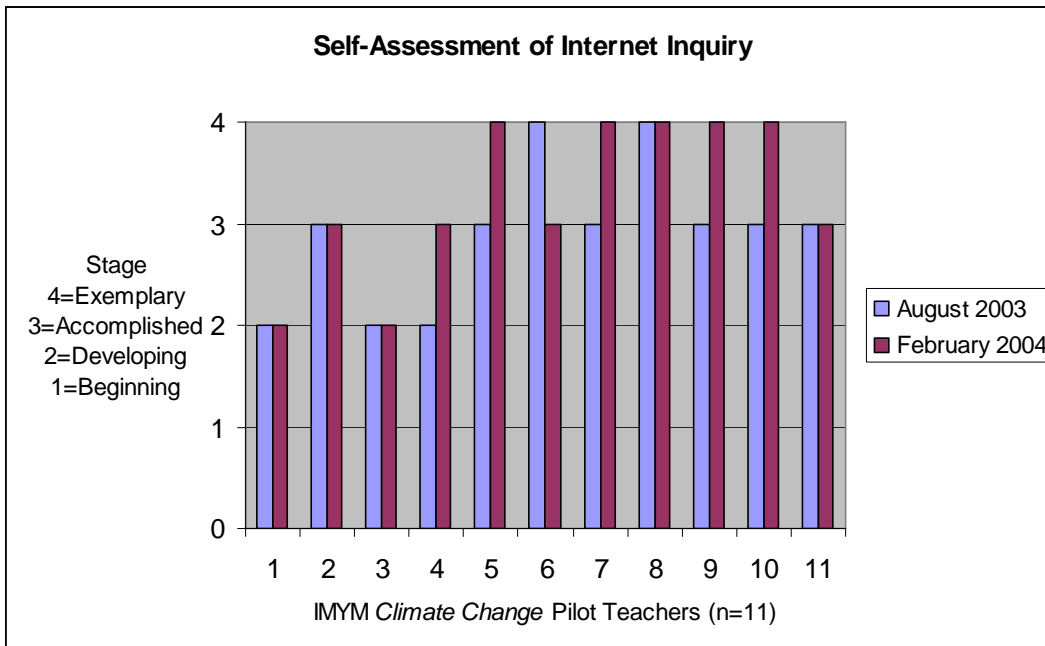


Table 21: IMYM Climate Change Pilot Teachers: Self-Assessment of Internet Inquiry

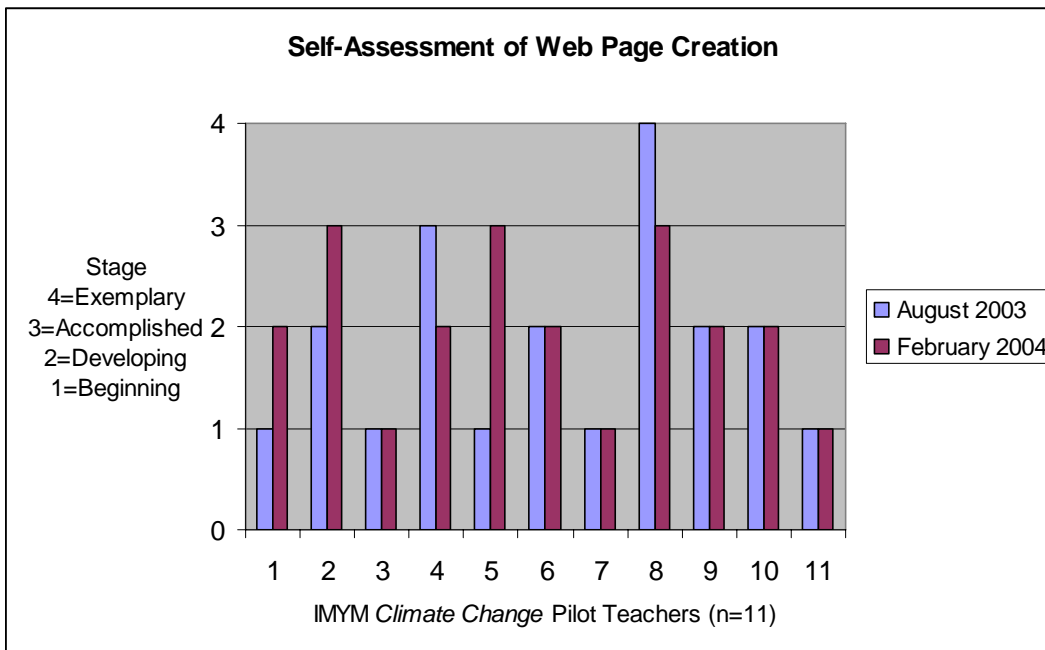


Table 22: IMYM Climate Change Pilot Teachers: Self-Assessment of Web Page Creation

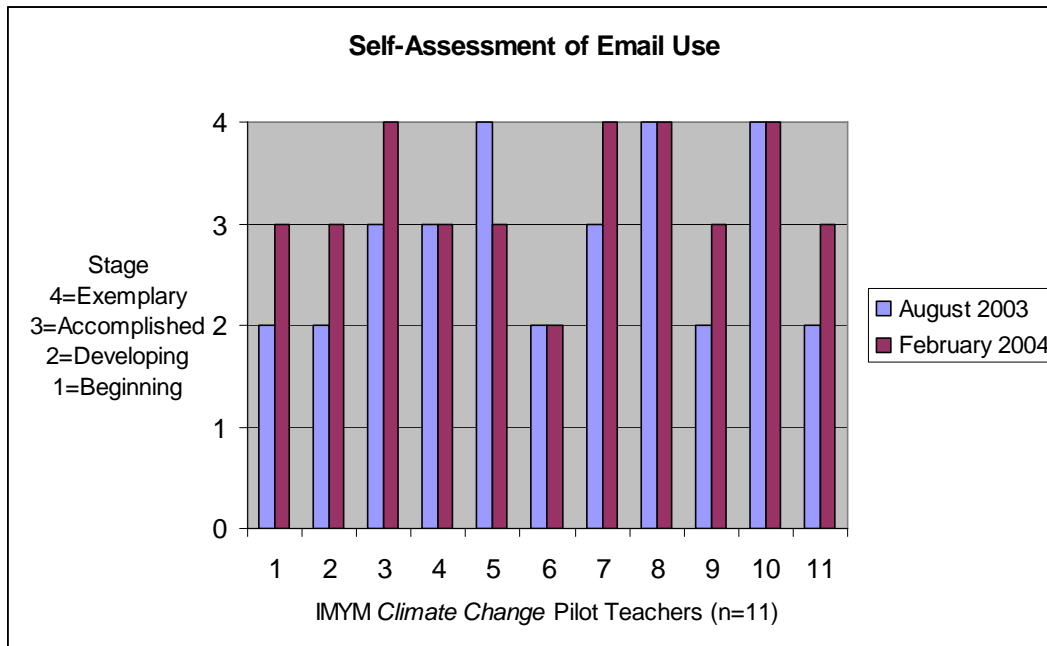


Table 23: IMYM Climate Change Pilot Teachers: Self-Assessment of Email Use

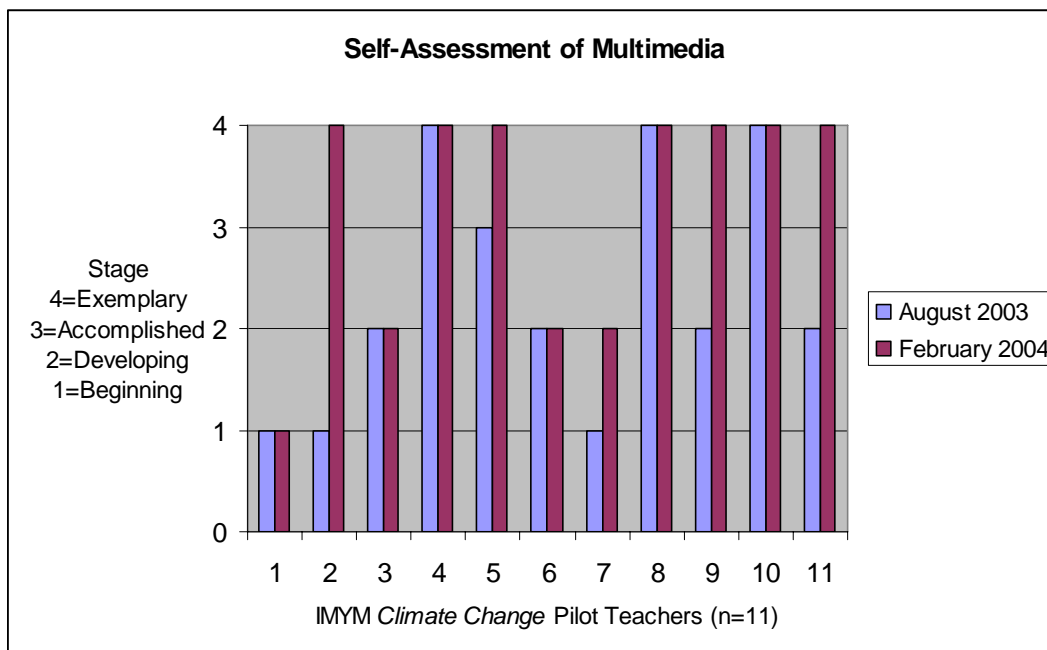


Table 24: IMYM Climate Change Pilot Teachers: Self-Assessment of Multimedia

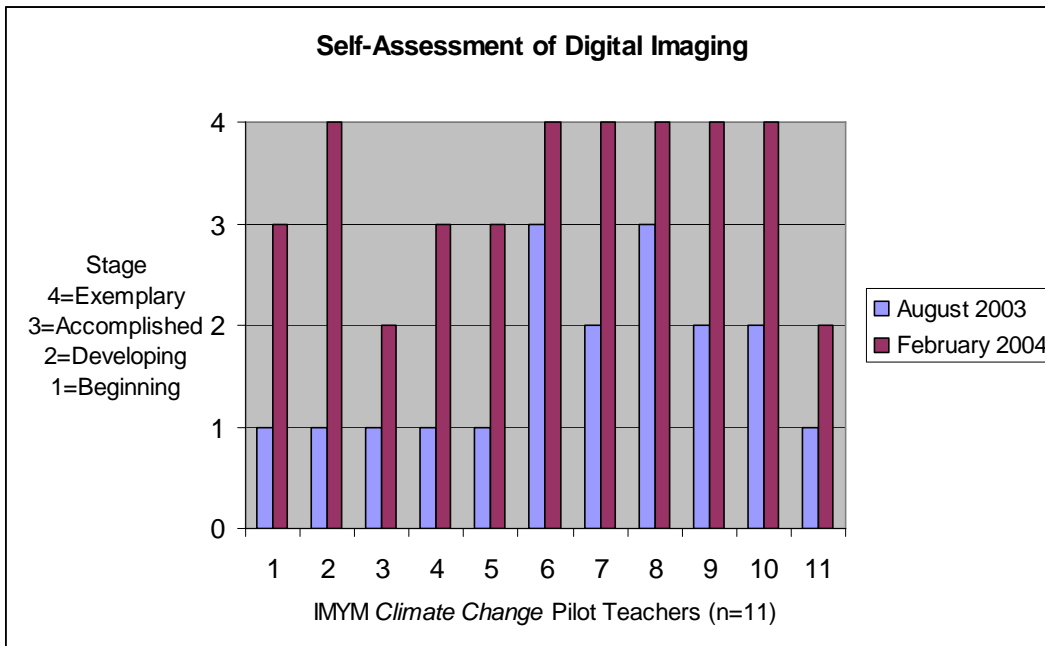


Table 25: IMYM Climate Change Pilot Teachers: Self-Assessment of Digital Imaging

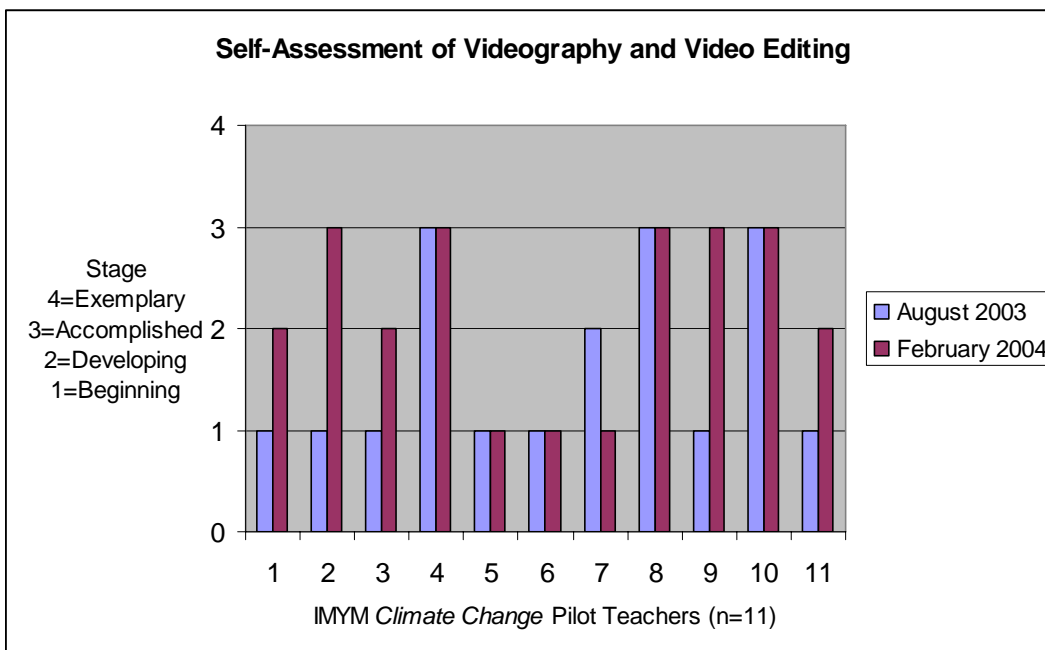


Table 26: IMYM Climate Change Pilot Teachers: Self-Assessment of Videography and Video Editing

4.1.3 Key Findings –Self-Assessment Rubrics

The self-assessment rubrics indicated a general increase in the overall ICT and pedagogical skills of the *Climate Change* pilot teachers. There was considerable gain in areas of focus, such as an increase in skills in digital imaging with the digital camera the pilot teachers received, as well as an increase in their skills in Internet searching.

4.2 Feedback on the Climate Change Interdisciplinary Unit

The *Climate Change* interdisciplinary unit has six components. These components include OLEs (Ongoing Learning Experiences), ICTs (Information and Communication Technology Learning Experiences) and Modules 1-4. The process of formative evaluation was crucial for the pilot teachers to carry out because it will allow the IMYM development team and writer the opportunity to revise content for future IMYM teachers.

4.2.1 OLEs

There are ten OLEs (Ongoing Learning Experiences) in the *Climate Change* interdisciplinary unit

- OLE.1 *Binder Reminder*
- OLE.2 *Daily Edit*
- OLE.3 *Daily Math and Problem Solving*
- OLE.4 *Reading Circle*
- OLE.5 *Share the Learning*
- OLE.6 *Collaborative Learning*
- OLE.7 *Speak Yea! Hear Yea!*
- OLE.8 *Reflection Journal*
- OLE.9 *Newspaper*
- OLE.10 *Electronic Collection*

Each OLE provides ways for students to use ICT to complete daily, weekly, or monthly tasks throughout the school year. For example, OLE.1 *Binder Reminder* requires the students to

organize their work in progress into a binder, while OLE.8: *Reflection Journal* encourages students to develop their meta-cognitive skills. One IMYM *Climate Change* pilot teachers stated

The OLE's were very useful because they helped me to fine tune my Grade 5 program. I use the reflections on a daily and weekly basis now. I find that this is of great importance since students tend to forget what they've done. This is a great asset when we need to reflect on what we've done for portfolios. I have used the reading circles successfully and have adapted the ideas according to my classroom needs (personal communication, IMYM pilot teacher).

In order to collect feedback on each of these ten OLEs, pilot teachers were asked to complete a set of multiple choice questions (see Appendix C). Each of the fifteen OLE quizzes contains the same set of fifteen questions. Results of every OLE quiz is analyzed below in order to determine if the OLE was effective and what revisions are necessary. Raw data is contained in Appendix C.

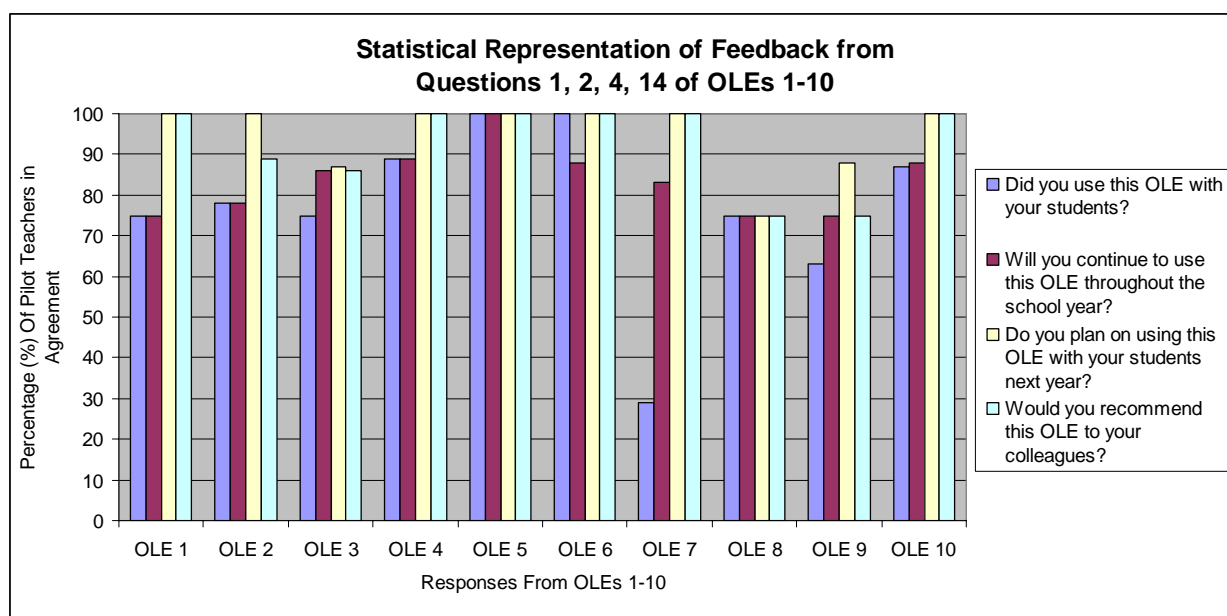


Table 27: Statistical Representation of Feedback from Questions 1, 2, 4, 14 of OLEs 1-10 (see Appendix C)

OLE.1 Binder Reminder

OLE.1 *Binder Reminder* provides strategies for students to organize and maintain various pieces of work within an interdisciplinary binder for the duration of the school year. Eight of the fifteen pilot teachers provided feedback on OLE.1 and eight of the respondents plan to continue using these OLEs weekly during the next school year. Following are the comments of some of the IMYM pilot teachers on OLE.1.

I used the binder in a very different way and we called it a "project binder" It was mainly a hard copy of our work.

I've done some version of this OLE for many years now. I tried to tie the suggestions in our "mega-binder" to what I was already comfortable doing and seemed to find a happy medium. I expect I'll add more technology aspects to this OLE each year.

I plan to use this in our next unit. Probably more so than in this unit as I have a better understanding of how I can implement it.

This is a great help for students especially those who have a tendency to lose things. It was difficult for some to get in the habit of putting things away in the right place. Some are still struggling but are progressing. It also helps them to locate the missing information more easily than just my asking for them.

This is difficult because my students miss so many days of school. I have many students who have missed 1/2 of this school year already. Students do not provide their own binders. I have three binders for each student for the year. They do not have a separate binder for IMYM.

OLE.2 Daily Edit

OLE.2 *Daily Edit* provides strategies for students to continually review and practice spelling, grammar, punctuation, capitalization, spell check, grammar check, electronic thesaurus, word processing, and formatting, and in context of their daily writing. For OLE.2, there were nine respondents providing feedback. Of the nine respondents, 78% stated they used OLE.2 with their students and will continue to use this OLE after the pilot study finishes, 56% of the respondents used OLE.2 daily, while the other 44% used OLE.2 once a week.

In the comment section, an IMYM *Climate Change* pilot teacher commented, “*Daily Edit* helps students to focus on their work. Working with partners help them to share their knowledge” while another pilot teacher commented, “I plan on using this OLE for the rest of the year”. After viewing the results from the other questions, it would seem that OLE.2 was a necessary component of the *Climate Change* interdisciplinary unit. Following are additional comments of the IMYM pilot teachers on OLE.2.

I have assigned daily edit activities to my students on a weekly cycle. I will be continuing this OLE till the end of May.

I plan on using this OLE for the rest of the year. I have yet to do all the activities. I have also taught the students to use a method in order for us to correct our work more efficiently. This works well in French due to the complexity of the language.

Some weeks, I have used this OLE on a daily basis in grammar, but for the most part, I continue to use this strategy as part of my weekly spelling tests. I've done this for many years now and will continue to do so. I'd like to get to the point where I have a few sentences on the computer for the kids to edit each day.

I used a commercially produced book for daily edit and the tests from it.

I had my own daily edit already in place. It consists of 5 edit questions daily. I used this OLE last year and it is a great warm up activity as well as reinforcing editing skills.

Daily edit helps students to apply their spelling strategies to their written work in such a manner as to encourage editing to become automatic and internalized.

I am excited to introduce daily edit on the computer. I want to show my students how to use spell-check and grammar check.

OLE.3 Daily Math and Problem Solving

OLE.3 *Daily Math and Problem Solving* provides strategies for students to solve a weekly math problem and practice daily estimations, mental math and problem solving. For this OLE, there were eight respondents, but only questions one, three, and four were answered by all eight. As with OLE.1, six of the eight respondents used OLE.3 with their students while seven of

the eight stated they would use OLE.3 next year. Following are some of the comments of the IMYM pilot teachers on OLE.3.

Time and our organization didn't allow for completing this LE this time round.

I have always incorporated weekly problem solving questions, and mental math activities in my lesson plans.

We do a mental math activity at the start of every math class, and on Fridays, I assess the skill we've been practicing all week. I give the class a POW (Problem of the Week) early in the week. It is due on Fridays. We will be spending more time doing problems from the Internet in the second half of the year.

I used a different math program and didn't get into using the computer for daily math problems.

I had similar problem solving, warm ups already in place. Although they are similar in principle there is variations to this OLE format. However, as ICT becomes more stable infrastructure this has possibilities for us.

When the students are working on daily math problems, it helps them develop better problem solving skills and stay focused on the task. Working in groups helped them to see that there are different ways of solving problems.

Students are just learning to use the Internet for the daily problem solving. Some of my students do not have parental permission to use the Internet.

OLE.4 Reading Circle

OLE.4 *Reading Circle* provides strategies for students to read and discuss appropriate works of fiction, non-fiction and information texts. Eight of the nine respondents said they would continue to use the OLE throughout the remainder of this school year and would recommend this OLE to their colleagues. Following are some of the comments of the IMYM pilot teachers on OLE.4.

Then the kids broke into their groups where they came up with a title and a summary for each chapter. They saved their work in their group's file, adding to it after each chapter. They all took turns typing the info on the computer, but I found one or two students in each group carried the others. Those with weaker editing skills didn't pick up as much as I had hoped they would from the better

writers. This was my first attempt at studying a novel in this way, so maybe I wasn't as clear with my expectations as I could have been.

I had other resources with the roles for a reading circle that we used.

I used this OLE in a way that everyone in the group had to complete all the work, on their own papers but they had a lot of time to discuss answers as a group. Next time I will follow the OLE a little closer and have each member working on something different and then share with the group. After the novel is done they would have had a chance to do every type of activity.

I'm trying to personally improve this area. I tried some activities but I am still working on a comfort level. I intend to continue growth in the area this year and hope to incorporate more of these OLEs in my routine.

Students really enjoyed Reading Circles. They improved greatly on sharing, listening and staying on task. They were more open and receptive to different points of view and different ideas. Initially, they had difficulty making predictions and connections. These skills also improved. They enjoy reading more challenging books. The amount of books that they read has also increased and they are reading better books (in both languages).

We did this within our guided reading group. Students did not have specific roles but it does help them to talk about what they are reading.

OLE.5 Share the Learning

OLE.5 *Share the Learning* provides strategies for students to share what they learn with classmates, friends and/or parents. Of seven respondents, all will continue to use this OLE for the remainder of this school year, and would recommend this OLE to their colleagues. Following are some of the comments of the IMYM pilot teachers on OLE.5.

As a class, we should have done this more often. Students would share their learning everyday orally, but they had a hard time writing it out. We would also forget or usually run out of time to fill out the sheets. They would not hesitate to get up and show something new to classmates. It was just hard to get written proof of this sharing activity.

Many students have never really reflected upon their learning. This has been a wonderful learning experience.

BLMs were great.

We shared some of our info daily, some weekly, and some as we completed our work (2-3 weeks or more). The kids were excited about this as they felt our class was "special" doing this project. They have let the other Grade 5 classes in our school know that they are willing and able to teach them to use the digital camera, PowerPoint, Excel, etc., whenever they like. Our displays have been changed several times throughout the project, and students and teachers of all Grade levels stop by on a fairly regular basis to see "what's up" on our boards and walls.

It helped the students to reflect on what they had learned in a day as well as a week. It was interesting to hear what each person chose to talk about for our weekly share the learning.

OLE.6 Collaborative Learning

OLE.6 Collaborative Learning provides strategies for students to take on roles, responsibilities and expectations of collaborative work. Of eight respondents, all plan to use this OLE with next year's students, and all would recommend it to colleagues. Following are some of the comments of the IMYM pilot teachers on OLE.6.

I have my students put into various groups throughout the year for projects, stories, science experiments, etc. The students who are better at cooperating with one another seem to learn more from and share more with others. The less cooperative students have difficulty with group work. Still others tend to fool around too much as they see group work and group activities as "play time".

This was a major component in making this unit a success with our multi-graded class.

This really helped students to stay on task and to work as a group. They needed this to help organize their ideas and work loads. It really made them more independent from the teacher's direct interventions. It helps them to become more autonomous. It helped them also to be more creative. It fostered divergent thinking. It also helped them to recognize and appreciate other people's strengths.

I have to modify the amount of reading and ease the students into working cooperatively.

OLE.7 *Speak Yea! Hear Yea!*

OLE.7 *Speak Yea! Hear Yea!* enables students to develop speaking, listening and discussion skills. Of seven respondents, only two respondents had already used this OLE, but the other five planned to use it over the remainder of the school year and all planned to use it with next year's students and would recommend it to their colleagues. Following are some of the comments of the IMYM pilot teachers on OLE.7.

I have not yet used this OLE this year but I do intend on using before the end of the year. I will definitely use earlier in class next year.

I would recommend it to someone teaching another class.

I hope to use this LE this year...but we seem to be in a continual ocean of new things. I really like this LE and think it will be very effective.

I do this indirectly and don't put a name to it.

Although I did not use this OLE in this project, I do hope to use it to some degree later this year. My students do a fair bit of speaking/reporting/discussing in class, so they are getting quite comfortable speaking in front of their peers. However, we have not tried using this format as of yet.

I intend to continue to use this OLE throughout the year. I will use the BLMs more as the year progresses

OLE.8 *Reflection Journal*

OLE.8 *Reflection Journal* provides strategies for students to reflect on their learning by writing in their journal. It is intended to develop students' metacognitive skills. Six of the eight respondents used this OLE, plan to continue using it and would recommend it to their colleagues. Following are some of the comments of the IMYM pilot teachers on OLE.8.

I should have planned better and done these more regularly, each week for sure. We would forget on Friday and try to complete them from memory the next week. Thus did not work very well. Students had a really difficult time trying to figure out what they had learned. They knew that they could do lots of new things in word processing or in mapping or other, but they had a hard time saying what

skills they had learned. Maybe a checklist would have been more helpful for my group.

We will definitely use this next year.

I need to do some major changes in my instruction.

I didn't feel the majority of my students benefited much from writing in their journals. This is largely because many of my students are not strong writers. The "I don't enjoy writing" group wrote as little as they could (and poorly, I might add). Those who had better writing skills to begin with got more out of this exercise. I've used journals off and on throughout my years of teaching, with more of those years being off years. I guess my biggest problem with journals is that I just don't see the growth in writing skills that I expect to see at the Grade 5 level so I choose to have the kids do other forms of writing.

OLE.9 Newspaper

OLE.9 Newspaper provides strategies for students to learn about newspapers and the who, what, when, where, how format of their articles. Of the eight respondents, five already used this OLE, six plan to continue to use it over the remainder of the school year and seven plan to use it with next year's students. Following are some of the comments of the IMYM pilot teachers on OLE.9.

We are too late to use this OLE before the meeting. We will be preparing a mini entry in the Newsletter in the February. We are responsible for writing the whole Newsletter in March. Therefore, we will be using this OLE at that time and till the end of the year.

It helped my students because they are not familiar with newspapers. Many of them never see them.

The class enjoyed working with the newspaper. I need to use this resource to its potential. One could do so many things with a class set of papers.

We used a BLM from one of the ICTs (on paper) for this activity. Unfortunately, we started this late in December and were a bit rushed trying to finish individual articles for our newspaper before the break. I think if we did this activity again, it would work better. The pace was a bit too fast for some of the kids.

Although, I didn't do as directed in this OLE we have current events twice a week. I am going to use the BLM as a variation of the current one used. I hope this frame will assist the students more (that need greater guidance).

OLE.10 Electronic Collection

OLE.10 *Electronic Collection* provides strategies for students to maintain an electronic collection of their work for future reference and use. Of eight respondents, seven used this OLE and plan to continue using it over the remainder of this school year. All respondents plan to use it with next year's students and would reconnect it to a colleague. Following are some of the comments of the IMYM pilot teachers on OLE.10.

They are really enjoying this activity. We are still working on the portfolio. It is still ongoing and will continue to the end of the year. They have written parts and work in the Presentation. Their March Parent-Teacher interview is centred on this and they will present their Electronic Portfolio to their parents at that time (on the computers).

I am not very comfortable with this yet and I know that my students are not ready.

The students are quite good at saving their work and naming it exactly as instructed. Some found out the hard way that they must file their work properly, or it will get lost - and assignments sometimes must be redone. They seem to have a very good understanding of how the file system works on computers, similar to their subject dividers in their binders on paper. Parents were quite impressed by their files/portfolios on our Climate Change Awareness Evening.

I did not get to the full model of this OLE. We have our work saved on their own U drive but have not done the mapping and organizing that is in this OLE. Still working on that.

Students even brought in CD-ROMs so they could take what they had home to present to family members.

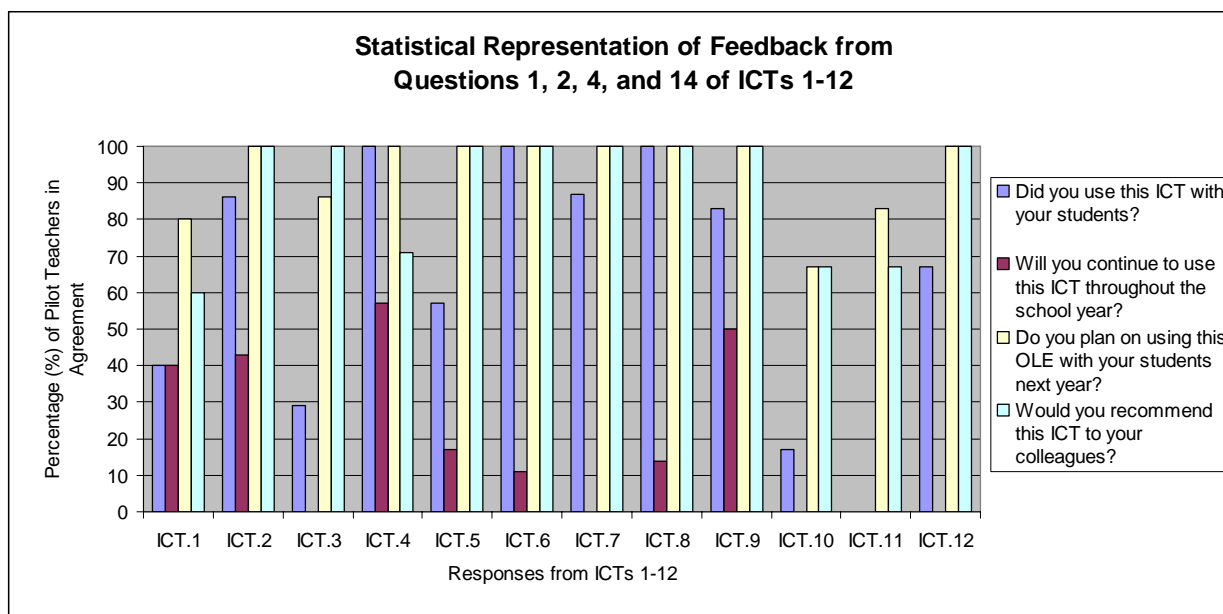
4.2.2 ICTs

There are twelve ICTs (Information and Communication Technology) learning experiences in the *Climate Change* interdisciplinary unit.

- ICT.1 *Toolbox Binder*

- ICT.2 *Write This Down*
- ICT.3 *Riddle Me This*
- ICT.4 *Looks Like This*
- ICT.5 *Roam Your ROM*
- ICT.6 *Inspired*
- ICT.7 *Caught in Action*
- ICT.8 *Make Your Point*
- ICT.9 *Looking for It*
- ICT.10 *Finding It*
- ICT.11 *Making It*
- ICT.12 *Chart Me This*

Teachers choose from among the ICT learning experiences in order to introduce a particular ICT tool to their students in the curricular context of their choice. ICT learning experiences are not repeated, nor is it necessary to do each one.



**Table 28: Statistical Representation of Feedback from Questions 1, 2, 4, and 14
of ICTs 1-12 (see Appendix C)**

ICT.1 Toolbox Binder

ICT.1 *Toolbox Binder* provides strategies for students to learn how to assemble a group ICT binder. Of five respondents, only two used this ICT, however four plan to use it with next year's students. Following are some of the comments of the IMYM pilot teachers on ICT.1.

I found the management of this LE tricky. I was unclear of how collaborative groups shared this binder, as my student groups are frequently changing. I tried this LE at the beginning of my ICT Instruction, and the students were not familiar enough with the ICT skills to do a quality job. I'd do this once many of the ICTs had been addressed.

I often used the whiteboard in my computer lab or the chalkboard in our classroom, especially when using a new program for the students. I only used one of the BLMs from this ICT.

We did do this as a formal component as we worked through various ICTs and students took notes accordingly.

I found the students really needed this ICT to verify if they all the components in order. It reminded them of missing work and then they were able to complete them. I took a while for them to organize their binders correctly. It also took some students a long time to become independent in this area. Some are still working on it. It really reduced the number of lost assignments and kept their work neatly and in one piece.

We just weren't ready.

ICT.2 Write This Down

ICT.2 *Write This Down!* provides strategies for students to review word processing skills and to learn to write word processing "help" files for other students. Of seven respondents, six used this ICT and all planned to use it with next year's students and would recommend it to a colleague. Following are some of the comments of the IMYM pilot teachers on ICT.2.

I have worked on this learning experience with my students over and over again. They came with no skills.

The students have made so much progress in this area that it just overwhelms me. They have picked up on the use of technology and have applied it easily to their work. They are so very confident and unafraid to take risks. They are no longer

dependent on my instructions and are very inventive. They are able to maneuver and to adapt many computer programs and are very skillful on the Internet. They are producing more creative and more elaborate projects. They are so enthusiastic about learning!

We shared much of our learning with one another, showing classmates how we did something or where we found something. We did a lot of step-by-step work as a large group, especially when we were first learning a program.

ICT.3 Riddle Me This!

ICT.3 *Riddle Me This!* provides strategies for students to learn to write, send, receive and reply to emails. Of seven respondents, only two used this ICT, however six plan to use it with next year's students and all would recommend it to their colleagues. Technical and bandwidth problems seemed to make this ICT difficult for some students to do successfully. Following are some of the comments of the IMYM pilot teachers on ICT.3.

The students really enjoyed this activity and they learned much from it. Unfortunately, we had such a hard time with the Internet connections at the school that most of the students this activity at home. We could not stay connected to the Internet for more than a few minutes (1 or 2). The problem was ongoing. Some students did not have the Internet at home; they were the ones using the computers in the school (when they worked). This did not discourage them because they were so fascinated with this activity. A positive was that many students worked independently (at their homes) and completed the assignment. All students learned the basics of emailing and are presently using these skills. It was a fun activity for them. They learned by playing and having fun; this is important.

I do plan to use this in my classroom third term. We had to start slow but I am confident that we will complete this ICT by the end of the year. I had everything arranged but changed my mind. My students are just learning so I had to slow things down. I really feel that they have developed many more skills and will be ready later this year. I did recommend this to one of my colleagues.

Too many Internet problems. I hope this will be fixed in the near future. In the past the students just used my account when doing other projects that required email.

I really liked this ICT. It is time consuming because of the weak keyboarding skills.

ICT.4 Looks Like This

ICT.4 *Looks Like This!* provides strategies for students to learn to use paint and draw software to create title pages. Of seven respondents, all used this ICT and plan to use it with next year's students. Following are some of the comments of the IMYM pilot teachers on ICT.4.

I have incorporated this ICT within all subject areas using Publisher and Paint. There is definitely time for change.

Most of the students were very familiar with Paint at the start of the year. They had to work as a group to come up with one title page per group. Most groups tried to take at least one idea from each of the group members.

Students have made remarkable progress in this area. They have shared their learning with one another. They have gained much confidence in their abilities. They are very creative and imaginative and are still finding shortcuts for different tasks. They really enjoyed the hands-on activities and because of these they have retained more information. They have more pride in their work and are so eager to share.

ICT.5: Roam Your ROM!

ICT.5 *Roam Your ROM!* provides strategies for students to learn to search for information using the CD-ROM resources in the IMYM classroom. Of seven respondents only four used this ICT, however all plan to use it with next year's students and would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on ICT.5

Students and teachers are not allowed to run CD-ROMs on the network at our school.

Any CDs we have are site licensed and loaded onto the file server for all students to access. We need to change this.

I found that the students are very familiar with using CD-ROMs for games and could navigate within the programs very well, but they were not familiar with using CD-ROMs for researching topics to find information. We did not spend a great deal of time on this ICT, and what we did, have to be done with much one-on-one guidance. Some of the stronger students caught on fairly quickly. Those who have difficulty researching on paper experienced the most difficulty.

We use the World Book encyclopedia CD-ROM and will continue with this ICT as the students are not getting enough practice in this area.

Students really got to learn how to maneuver and find information on CD ROMs.

This was another new skill for my students.

ICT.6 Inspired

ICT.6 *Inspired* provide strategies for students to learn to use concept mapping software to organize information in the curricular context of the teacher's choice. Of nine respondents, all used this ICT, but only one would continue to use it during the remainder of this school year. However, all plan to use this ICT with next year's students and would recommend it to their colleagues. Following are some of the comments of the IMYM pilot teachers on ICT.6.

This is an ongoing activity. Students are excited and catch on quickly! I wish I had a workstation with projector to access all day-there are so many opportunities during a day to use Concept Mapping to be able to print and distribute to class immediately.

We only had two to three working computers in our classroom for most of the pilot project. A few of the groups/individual students used Inspiration 7.5 for their work within the classroom, but because we couldn't access these files in our labs (6.0 version), most of the concept maps were completed using the 6.0 version of Inspiration.

This ICT helped break the students into the use of toolbars and what can be done to change the look of something without a great deal of text involved. They enjoyed playing with and discovering the different aspects of the program.

I have not as yet used this as much as I intend to in the future. I like this software piece.

This is a great learning tool for students.

This was wonderful. They caught on in a flash and became independent in a short time. This has helped them to organize their ideas and their work. It also helped them to proceed to PowerPoint and other programs. They have done many small projects using this. They are still enthusiastic when using Inspiration.

My students shared their learning with classmates first and then with a Grade 8 student. This provided many opportunities for writing a letter and introducing

themselves and then a journal entry after they shared their learning with a Grade eight student.

ICT.7 Caught In Action

ICT.7 *Caught In Action* provides strategies for students to learn the skills to use a digital still camera and/or video camera. Of eight respondents, seven have already used this ICT and do not intend to repeat it during this school year. However, all intend to use this ICT with next year's students and would recommend this ICT to their colleagues. Following are some of the comments of the IMYM pilot teachers on ICT.7.

This was the best part of the project for the kids; they always looked forward to using the camera.

Students picked up on the use of the camera very easily and quickly. They found short cuts and were always willing to take pictures.

Students loved this ICT skill. They were then able to use the digital camera to take pictures for their PowerPoint presentations.

Due to time constraints we did not use this LE. Students did use the digital camera for projects, and to make a class guest book.

Using a digital camera has a great impact on outcomes and presentations. Students like looking at pictures, lots of discussion, REMEMBER WHEN.... always come up, especially when students forget about an event. It is a great way to capture their learning. They are disappointed if they were absent when students were able to use the digital camera.

The students loved using the camera and continue to enjoy using it for a variety of uses!

We used the camera throughout this unit. Students took images of different activities within the classroom but also for other activities throughout the school. They have taken great responsibility with this device and enjoy using it.

ICT.8 Make Your Point!

ICT.8 *Make Your Point!* provides strategies for students to learn the skills to create a multimedia presentation. Of seven respondents, all used this ICT, plan to use it with next year's

students, and would recommend it to their colleagues. Following are some of the comments of the IMYM pilot teachers on ICT.8.

Students were given an introductory run-through of the different program features using the LCD projector, and then they played around and tried to figure out how to use PowerPoint. They learned easily, found shortcuts to make it easier and shared their expertise with classmates and with other classes.

I still have eight students who have not learned to do this. Their attendance is so low. My other students are so proud of themselves. This was a great activity. Students could spend days working on one PowerPoint slide and not finish. Preplanning is not in some students vocabulary. Just do, not knowing where they will end up, or no sense of time. Students learn a lot. Data is most important, and then the bells and bows can be added. It is hard to break students away from this thought.

We were able to present to an audience of 150

PowerPoint was a hit with everyone! I didn't use the BLMs, but likely will for presentations later in the year. The kids were so keen, and with the guidance of our computer teacher, we jumped right in. I like the looks of the storyboard BLM and will probably use it as a "rough copy".

My students had great difficulty working together. A lot of time was used up for behavior management

Students were very motivated to use this ICT in their applications

ICT.9 Looking For It

ICT.9 *Looking For It* provides strategies for students to learn how to effectively and efficiently search the Internet. Of six respondents, five used this ICT, all plan to use it with next year's students and would recommend it to their colleagues. Following are some of the comments of the IMYM pilot teachers on ICT.9.

Did not complete this LE due to time constraints.

A person could spend a lot of time just on this ICT. Some students get very excited when a site(s) appears on their topic. But students don't read the information shown and are soon disappointed as the site that they were excited about was not appropriate to their needs. Material sometimes is beyond their reading and

comprehension level. Students have to decide (read) what is appropriate for their needs, assignment. They have to decide which site to view. Good research tool.

The students worked very well when they were given a site to go to. However, they had more difficulty sorting through all the sites to choose from when looking for general information. They also tend to believe everything they read on the Internet. It's hard to get them to look for other sources to support the research. (The first site you look at is not always the best source of information. It may not even be correct.)

Our Internet connectivity was not reliable this year. I hope the division resolves this soon. Although we had such a terrible time connecting to the Internet, students have done amazing progress in this area. Since January, problems with technology lessened and they are using these skills daily. They can locate information easily and can maneuver easily between the Internet and other programs. They can find information easily with key words and have become creative in their searches.

We are continuing this learning each week. This is very new to my students.

ICT.10 Finding It

ICT.10 *Finding It* provides strategies for students to hone their Internet searching skills. However, of six respondents only one used this ICT and four plan to use it with next year's students or would recommend it to their colleagues. Following are some of the comments of the IMYM pilot teachers for ICT.10.

They are so much more independent and successful when working on a task! I plan to use this activity towards the end of the year. However, many students still do not have permission to use the Internet.

Due to time constraints we did not complete this LE.

This is definitely an excellent ICT to use with students. I plan to use this before the school year is over. Not only a scavenger hunt about a subject related site but for our own School Division site - a lot of students, even teachers, bypass it. A excellent way to learn about navigating through a site, what is important, what to look for, etc.

I find the kids still have a very hard time sorting through encyclopedias (book or CD-ROM), non-fiction books, pamphlets, etc., when doing research. I feel they must have these skills well in place before they are able to do a good job of sorting through all the facts, near-facts, and non-facts that are out on the Internet.

Having said that, there are a number of students in my class who are at this level and use the Internet to do research, but they do this on their own, not through my instruction.

Our Internet connectivity is too inefficient for this activity

ICT.11 Making It

ICT.11 *Making It* provides strategies for students to learn create their own scavenger hunt and class web site. Of six respondents, none used this ICT and none planned to use it over the remainder of the school year. Lack of time, skills and Internet connectivity were mentioned as obstacles. However, five plan to use it with next year's students. Following are some of the comments of the IMYM pilot teachers on ICT.11.

We have not yet had time to use this ICT but we will be attempting it before year end...and most definitely with next year's group.

This may be something we can do towards the end of the year. I did not attempt to have them do this.

This is one ICT I need to experiment with. I would like to learn more about Web Page Design. I hope to start this before the end of the year.

The junior high students in our school create their own websites as part of their computer class. Our class already has an existing website which we can update as often as we like. Therefore, this is one of the ICTs I decided to omit.

I plan to use this in another curricular area later this year solely with the Grade 5 and up classes. Too many Internet connectivity problems at the beginning of the year.

ICT.12 Chart Me This!

ICT.12 *Chart Me This!* provides strategies for students to learn to use spreadsheets to record and graph data. Of six respondents, only four used this ICT and none plan to use it during the remainder of this school year. Lack of time and skills were mentioned as obstacles. However, all plan to use it with next year's students and all would recommend it to their colleagues.

Following are some of the comments of the IMYM pilot teachers on ICT.12.

Students need a lot of work in this area. For a lot of students it is a new area / software they never experimented with. Can not assume students have previous knowledge. A lot of pre-teaching needs to be done. Students catch on very quickly to new things when focused and listening. Great things happened with this ICT. Need to do more of it.

I would like to use this ICT later in the year when we do more of our graphing in math. I think the kids would enjoy displaying the data in a "new" way. We did not use this ICT during the Climate Change unit mainly because of time - some things had to be left out.

Half of the class has used spreadsheets previously as I supplement the data management strand with spreadsheets

I did not feel confident in my knowledge of data base and spreadsheets to attempt this on the computer.

We did do research on the computer but we made our graphs on paper.

I plan on learning these programs for next year and hope to use them then. This is a fabulous activity. Most students breeze through it without problems.

4.2.3 Module 1

There are four content modules within the *Climate Change* interdisciplinary unit.

- Module 1 *What is Climate Change?*
- Module 2 *How Does Climate Change Affect Us?*
- Module 3 *What Can We Do?*
- Module 4 *Climate Change Kids' Club in Action*

Module 1 is composed of eight learning experiences (LEs).

- M1.1 *The Big Picture*
- M1.2 *Everybody Talks About the Weather*
- M1.3 *Properties of Air*
- M1.4 *Recording Weather*
- M1.5 *Cloud Formations*
- M1.6 *Let's Look At Climate Change*
- M1.7 *Creation of the Climate Change Kid's Club*
- M1.8 *Data Analysis and Display*

Each Learning Experience has a specific purpose that provides strategies for students to build their understanding of climate change. Similar to the OLEs and ICTs, the Modules provide

instructional strategies as well as necessary student learning resources (e.g., BLMs) to help pilot teachers and their students successfully complete each learning experience.

The analysis of each question from the online feedback forms is found in Appendix D. Listed below is the commentary provided by the pilot teachers on each learning experience in Module 1.

M1.1 *The Big Picture*

M1.1 is a learning experience that provides strategies for students to identify the importance of citizenship, their goals and responsibilities as global citizens, and aspects of sustainable development. Students share their prior knowledge of climate change, and take the *Climate Change Challenge*. Of nine respondents, eight used this LE, seven plan to use it with next year's students and six would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M1.1:

Next year I will:

1) With the whole classroom, create a concept map using Inspiration of the students' prior knowledge of climate change.

I would add to this using a different color every day at the beginning of the class.

2) Do brainstorming activity in collaborative groups for what it means to be a good citizen.

3) Think-pair-share: 10 needs they have in their lives.

Concept Mapping was difficult...Climate Change Challenge website was very difficult and hard to log on.

The Sort and Predict vocabulary was difficult for the kids - even with the help of a dictionary in some cases.

The information was very difficult for my students. Especially BLM for the sort and predict.

My students really dragged on in this module. It took them forever to get organized. They had difficulty putting things in the right place. The Climate Awareness Week aspect sounded pretty vague to them. It took a while to

understand the project. They needed more structure and details or suggestions to get started.

My students liked knowing what was to come. They got excited.

M1.2 Everybody Talks About the Weather

M1.2 is learning experience that provides strategies for students to activate their prior knowledge, complete a learning plan, and create a collaborative multimedia presentation to share their learning of weather, climate, and factors that influence climate. Of ten respondents, all used this LE, seven would use it with next year's students and nine would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M1.2.

The BLMs and TBLMs are great guide lines for students and for evaluation. I am using BLM M1.2 #3 Group Work Reflection all the time.

Next year I will prepare learning centres in order to get students to explore the topic. Bring students to library and find books which could answer the following question: What is climate change? I would then ask them to bring all they can find at home and I would bring in other resources. Once the resources collected we could create learning centres which would bring the students to explore and understand the difference between climate and weather and climate change using books, web sites and other resources. I would provide them with a BLM where they would collect data and record their information. At the end of each centre we would discuss what we learned and continue to add words to our web. I would also ask students if they have any questions about climate change and start writing these questions down on strips of paper which would be part of our inquiry wall. The words from our web would also be posted and we would start to classify them into categories.

One of the learning centres would be the collection of weather data from the Environment Canada website for our area. Students would be required to fill out and present today's weather. We would post the weather on the classroom wall and eventually would use this in math in order to graph the findings. Later we would do other Canadian cities.

I did not feel my students had enough prior knowledge for this activity.

This was a good way to check where students were at early in the unit. It gave the kids a glimpse of places to look for answers to their questions.

I found it difficult to find some of the cities' temps and precipitation records

As we work our science clusters on a 3 year plan weather will not come up again for 2 years. (multi-grade setting)

I really enjoyed this one, but I had some group dynamic issues

They really enjoyed this activity. It was more realistic and tangible to them. It made more sense.

M1.3 Properties of Air

M1.3 is a learning experience that provides strategies for students to find information on and conduct experiments to teach one of the six properties of air. Of ten respondents, nine used this LE and plan to use it with next year's students, and all would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M1.3.

Some of my students found this difficult to do because they were scrambling to get supplies and really weren't sure how to teach their property.

At first, they did not know about the different properties of air. Then they got interested when we discussed it together and talked about setting up experiments. They had great difficulty writing their experiments since they had never done this last year and did not have the skills. They were very cooperative as a group and really worked together well.

My students did not present to the class but did pair up and share what they learned.

Great BLMs and TBLMs and suggested resources. Suggested Internet sites are great. I like that. One does not have to spend endless hours searching for safe student sites.

I used the experiments from the curriculum. I then circulated with the laptop and with the students we created a power point which was presented along side the presentations. The presentation was then printed for the student's binders. A short test was then made and completed by all. Very visual and hands on.

Would switch this to a later date.

The students thought the experiments were fun. They especially enjoyed taking photos of the experiments and inserting them into their PowerPoint presentations. This was a great way to show and tell what they've learned. Each group chose two experiments to demonstrate to the class and explain what was happening.

They used the pictures taken of their demo to put on their slide show with a write up about their experiment.

I gave the students the outlines for the properties of air activities. They had all the steps and the equipment needed to-do the experiments. They had to write up what happened in their experiment and illustrate their results. They shared their findings with the class. I also had a master sheet prepared with results and pictures. We wrote notes in their binder for test purposes

Again the reason for not using it is the 3 year plan in my multi level class. I do like the learning centres approach for this concept.

M1.4 Recording Weather

M1.4 is a learning experience that provides strategies for students to measure, observe, gather, and analyze local weather data. Of the nine respondents, eight used this LE and plan to use it with next year's students. Following are comments of the IMYM pilot teachers on M1.4.

The kids enjoyed this one. I tied it in with the daily weather reporter who read today's weather over the school P/A system in the morning. We did not do our graphs on the computer but on paper... lack of teacher knowledge and lack of time.

My students also enjoyed using the Frontier School Division's website to record daily temperatures.

I definitely will use this LE learning center next year. Next year I would use this learning experience in conjunction with the exploration centres as indicated in M1.2. I believe this needs to be developed first in order to use the language and be familiar with it. I also found an article on Weather in Wapiti #198 September 2003 p.6-13 which we read and used to become familiar with the unit. Language Arts: Collections- Weather, Winds and Kite Strings would be a good choice for next year as well. I would begin using this at the beginning of the unit in L.A.

Too difficult, too early for how I wanted to use this activity. We did collect a month's worth of weather and displayed it. It would have been great for map reading skills. Again, too early.

The students continue to display the daily weather report for all to see.

This component worked very well with our Climate Awareness Presentations as we interrupted the program with a weather report. Went over well.

M1.5 Cloud Formations

M1.5 is a learning experience that provides strategies for students to research the water cycle and three major cloud formations. Of nine respondents, all used this LE and would use it with next year's students. Eight of these teachers would recommend this LE to their colleagues.

Following are comments of the IMYM pilot teachers on M1.5.

I can never get "Cloud in a Bottle" to work. BLM M1.5 #5 is excellent. I have used this for all viewed videos. Great! Cloud watching never happened - we had one big cloud overhead or not any at all. There are great videos from the Department of Education Library on this topic. I do want to go back to this LE later in the spring.

There is a prototype of the Water Cycle at the DREF which I found out later can be used to demonstrate the water cycle. I will use this next year. The 3-point approach is an excellent strategy. We did not create rap songs for this activity but did use this idea for the presentation where the students wrote a song and performed it in regards to climate change and what they had learned.

It was good, learning about the cloud formations but I had difficulty tying this in to climate change.

Some days it is very easy to determine the type(s) of clouds in the sky. Other days we felt it was a bit of a guess. We had several posters of clouds in our class, and we referred to them quite a bit.

We added the information to our PowerPoint presentations. Students found an educational website that encouraged them to use the pictures for educational purposes.

I did not modify the BLM, but I wish I had because the kids were finding out so much info they did not have enough room to record it.

They worked well on this learning experience. They enjoyed surfing the different sites to get information. They loved taking pictures of clouds and scanning and pasting pictures in their projects.

My students practiced their Internet searching skills to research the clouds formations. It was excellent practice for them.

M1.6 Let's Look at Climate Change

M1.6 is a learning experience that provides strategies for students to research climate change and to create comic strips to share their learning and educate others. M1.6 was introduced

to the teachers on Day 3 of the August 2003 workshop. Here the teachers formed collaborative groups of three by finding at least one other person they had not yet worked with. The specific task assigned was to answer the question, “What is climate change?” by using Internet queries and the *Climate Change* posters. The pilot teachers gathered and wrote notes with corresponding URLs that they could then share with the rest of the group. The purpose of this task was to help the pilot teachers generate deeper levels of understanding about the concept of climate change while at the same time, modeling the use of collaborative learning in the inquiry process (in the same way as their students would in their IMYM classroom). Of nine respondents, all used this LE and all used this LE and seven plan to use it with next year’s students. All would recommend this LE to their colleagues. Following are the comments of the IMYM pilot teachers on M1.6.

Kids were excited about getting into the content of climate change.

Students reviewed the climate change posters. Each group was responsible for reporting to the class important facts, findings, etc. I'll certainly do this different next year.

The posters were cut up and glued to large sheets in order to facilitate the use of the information and the breaking down of the information. I did not discuss the newspaper nor did the students create their comic strip at all at this point. I decided to change things at this point due to the large amount of work left to do and the time left till Xmas.

I think this learning experience would be better closer to the start of the project. I used the scenario cards and this went well. The comic strips were a hit and we displayed them for the school.

I put some of the BLMs on overhead sheets, and went over the information as a class. The kids loved creating comic strips, even though some had difficulty coming up with climate change themes.

We used some of this material for our Climate Change T.V. programming presentation.

We did not use all the components of this section. What we used were the Impact section and Climate Change Word Match (paper)

It was difficult for my students to gather information form the big posters. The level of French used is much higher than their reading level.

Next year, I think that I will cut and paste the information from the Internet and make a small Newspaper style format. They'll work on smaller articles. It will be easier to make scavenger hunt with this format. Also, I'll make some mini-quizzes and scrambled word activities, some graph activities, problem solving activities, etc. If I do it in French, I'll have to simplify some texts. Also, it would be easier to have a set of specific questions of interest to maintain their focus on small section. The posters have too much information for them; they are overwhelming.

Students started an Inspiration web about things they can do to help stop climate change.

M1.7 Creation of the Climate Change Kid's Club

M1.7 is a learning experience that provides strategies for students to establish the identity and purpose of their Climate Change Kids' Club. Of eight respondents, all used this LE, plan to use it with next year's students, and would recommend this LE to their colleagues. Following are the comments of the IMYM pilot teachers on M1.7.

I would like to pair up with an older class.

This learning experience was very motivating for the students to work on. I have not yet created the website.

This was a hit. Money was a problem for gathering supplies and my computers were still not here. We managed to sew banners and present them to the student body. Creating logos etc. was exciting for them.

Creating our Kids' Club mascot, logo, etc. and planning for our Awareness Evening was a major highlight of the unit. They really enjoyed being included in and being largely responsible for the planning of their night.

This was the highlight of the whole unit. Students were so motivated with this component. They organized themselves independently and created many visuals and a presentation which was used in our Climate Change Awareness day.

My students loved this one.

We are very late and we will be using this LE in March when we will be making a presentation at the monthly student assembly. We will also present to parents during Student/Parent/Teacher conferences.

We are currently still working on this. We are going to have much more time when Frontier Games are over next week.

M1.8 Data Analysis and Display

M1.8 is a learning experience that provides strategies for students to gather, analyze, and display weather and climate related data. Of eight respondents, only two used this LE, however six plan to use it with next year's students. Following are the comments of the IMYM pilot teachers on M1.8.

Would like to incorporate this learning activity within the next couple weeks in Math, data management, and charting.

I would use M1.8 after the M1.5 instead of at the end of the module.

The kids enjoyed graphing the weather data on the computer and are looking forward to doing more graphing on the computer throughout the year.

Just did not work for us (limited student resources, Internet down)

It ties in so well with data analysis for math.

4.2.4 Module 2

Module 2 is titled, “*How Does Climate Change Affect Us?*” and is divided into seven learning experiences.

- *M2.2 Consequences Of Our Actions*
- *M2.3 What the Data Shows...*
- *M2.4 Sharing the Consequences*
- *M2.5 Spreading the News*
- *M2.6 Weather Phenomena*
- *M2.7 Climate Climaxes*

Each learning experience (LE) provides strategies for students to build on their understanding of how climate change affects them. Similar to the OLEs, ICTs and Module 1, Module 2 provides instructional strategies as well as necessary student learning resources (e.g., BLMs) to help pilot

teachers successfully complete the learning experience. The analysis of each question from the online feedback forms is found in Appendix E. Listed below is the commentary provided by the IMYM pilot teachers on each learning experience in Module 2.

M2.1 What's Changed?

M2.1 is a learning experience that provides strategies for students to collect perceptions of climate change from their own community by interviewing community members. Of eight respondents, six use this LE, plan to use it with next year's students, and would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M2.1.

I think my students needed a BLM to guide them through the interview process. Something that included a scripted introduction to the survey and its purpose, as well as a format that would record answers and ages of the people being interviewed.

The Inuit Observations of Climate Change video has good information. In the last month or so I have noticed there are a lot of documentaries on TV about The North and / or Climate Changes. The posters are good as well. I used the poster web site and hard copy for students to relate to. When technology and resources are limited, students think that hard copy resources are not good any more or out of date and use this as an excuse as to why their task is incomplete.

Need to find a video in French for next year.

We watched the video.

This was a fun activity for the kids. Students were encouraged to interview people from young to old, but we were a little shy on interviews with the before 1920 and after 1980.

Due to lack of time, we did not do all of this LE. We viewed the video and discussed it in class. Students did not interview people but asked their parents and grandparents about the changes that these people had seen throughout the years. Then, in class we discussed their findings. We also related it to the two novels that they had read.

This was an excellent activity to use at the Grade five level. It also got students in my community talking with the elders. There were students sharing what they had learned with the elders at the Band Office Craft Sale.

M2.2 Consequences of Our Actions

M2.2 is a learning experience that provides strategies for students to research the consequences of climate change in the regions across Canada and to identify the social, economic, and environmental impacts. Of seven respondents, four used this LE six plan to use it with next year's students, and four would recommend this LE to their colleagues. Following are the comments of the IMYM pilot teachers on M2.2.

I ordered another set of posters online from the federal government site. (Yukon is still back ordered, just received NWT last week.) Each poster section was cut and laminated on matting. Students worked on Task 1 and 2. It was very interesting monitoring groups.

We only did a bit of M2.3. The posters were quite interesting and most of the kids liked working with them. Some of the kids found much of the information difficult to understand and all of the kids had trouble understanding some of the information (a few of the graphs in particular).

We are in the midst of doing this part and are not yet finished.

We really didn't venture past the boundaries of Berens River and Sach's Harbour

M2.3 What the Data Shows...

M2.3 is a learning experience that provides strategies for students to compare and contrast climatographs, display and analyze second-hand data, and create an advertisement about the causes and consequences of greenhouse gas emissions. Of seven respondents, only three used this LE, four plan to use it with next year's students, and five would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M2.3.

I made overheads of the climatographs. This was new to them, and some found it quite confusing to read.

This LE required Internet connectivity, so for us it was hit and miss...only some parts were used.

Our group has not done this part. I do intend to try it next year.

We did not complete this activity.

M2.4 Sharing the Consequences

M2.4 is learning experience that provides strategies for students to create posters and games that explain the consequences of climate change. Of seven respondents, five used this LE, six plan to use it with next year's students, and all would recommend it to their colleagues.

Following are the comments of the IMYM pilot teachers on M2.4.

We made our own posters to display our findings

We did not do this LE due to lack of time. However, I think the kids could have had a lot of fun with this one. I would like to try to fit this into the unit - at least some of it.

We are still working on this. We will be using these posters and quizzes during March assembly and our March newspaper articles.

Students worked in small groups to create posters. No attempts at the games but they did create word searches and fill in the blanks.

M2.5 Spreading the News

M2.5 is a learning experience that provides strategies for students to apply their new knowledge of the consequences of climate change by writing a news article for their group's newspaper. Of seven respondents, five used this LE, six plan to use it with next year's students, and all would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M2.5.

We published our work in our magazine

We combined this LE with M2.2.

We are still working on this.

We have not done this yet but would like to include this with our Awareness week.

M2.6 Weather Phenomena

M2.6 is a learning experience that provides strategies for students to research key features of a variety of weather phenomena, and to create brochures to represent the information. Of seven respondents, four used this LE, five plan to use it with next year's students, and six would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M2.6.

We ran out of time. Students like to talk about weather phenomena. Which some have experienced in the area. Will definitely do next year.

We tried to make it fit in to what we were doing.

The kids had a lot of fun with this LE, and they learned a lot, too. They had to do a lot of research for their posters of different weather phenomena. Adding art to their work was a hit, of course.

I created my own LE in this area. We did watch videos that I had and we used the 3-point approach to develop an understanding of "Weather Phenomena" Lots of discussion also took place in this area.

My kids enjoyed doing this project and I have brought a few of them for the afternoon on February 23.

I have not used this yet. It resembles a project that I did last year. I will be using it in the near future. It will be a combination of my previous projects and this BLM. Students will prepare a presentation using PowerPoint and Inspiration. They will present it using the LCD projector. They will also provide models of the weather phenomenon of their choice.

My students really enjoyed this. Again, they loved using the Internet to research their topic.

M2.7 Climate Climaxes

M2.7 is a learning experience that provides strategies for students to conduct reading circles using literature materials that relate to climate change. Of seven respondents, five used this LE, six plan to use it with next year's students, and all would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M2.7.

I used parts of this LE. Due to time I didn't conduct full blown reading circles. There are just too many new things going on at one time. I thought it better to try and master the things we had started rather than adding something else new to the mix. We did mini reading circles with shorter texts from our reading series that related to climate change.

I did read The Crystal Drop - when I started I couldn't put it down (Christmas break reading). I did a book talk with my class. The students had a difficult time relating or understanding the events of the story, like it would never happen in real life, events like the Crystal Drop only happens in the movies. Next year I would like to read this novel to the class. I'm still looking for a copy of The Golden Aquarians.

We did not write a poem, instead they wrote to DreamWorks studio to Steven Spielberg to ask him to turn the book "crystal drop" into a movie.

We had to share books for The Crystal Drop, so we read it together in class. It was also the first novel of the year, so I didn't mind keeping closer tabs on them. I like the idea of reading circles, though, and hope to use this for a future novel.

The poems that the class created are being spoken at our local poetry festival the first week of February. We were reading aloud, The Crystal Drop.

Students really enjoyed the books especially The Crystal Drop. For The Golden Aquarians, they had a choice of six differently projects (model of the planet, brochure, Word association, collage, poems, characters, comic trips etc.). They also did a class presentation. For the Crystal Drop, they wrote a Haiku and a story pyramid. They also illustrated the chapters and wrote summaries.

I found this helpful. It also allowed for the students to share their own thoughts and ideas. It also allowed for me to clear up any misconceptions.

4.2.5 Module 3

Module 3 is titled, "What can we do?" and is composed of six learning experiences

- M3.1 *Let's Look At Our Actions*
- M3.2 *How Do You Want Your Future World To Be?*
- M3.3 *The Survey Says...*
- M3.4 *On The Other Hand*
- M3.5 *Caring For The Earth*
- M3.6 *We Can All Make A Difference*

Each learning experience has a specific purpose that provides strategies for students to take individual action against climate change. Similar to the OLEs, ICTs, and Modules 1-2, Module 3

provides instructional strategies as well as necessary student learning resources (e.g., BLMs) to help pilot teachers and their students successfully complete each learning experience. The analysis of each question from the online feedback forms are found in Appendix F. Listed below is the commentary provided by the pilot teachers on each learning experience in Module 3.

M3.1 *Let's Look at our Actions*

M3.1 is a learning experience that provides strategies for students to use the inquiry process to identify possible solutions to address climate change. Of seven respondents, only three used this LE, however five plan to use it with next year's students, and six would recommend it to their colleagues. Following is a comment from an IMYM pilot teacher on M3.1.

Although we did not do this LE, we did discuss some of it. Hopefully, I'll find a little more time in future years to complete this LE properly.

Because of technical difficulties and my illness (absence from school), we ran out of time. We will be continuing throughout the year since the Weather module is supposed to be done year-round.

This has helped for our club. It has given the students many ideas.

M3.2 *How Do You Want Your Future World To Be?*

M3.2 is a learning experience that provides strategies for students to apply their learning about the human actions that cause climate change, by creating articles for the group newspaper. Of seven respondents, only two used this LE. Lack of time was cited as an obstacle. Following are the comments of the IMYM pilot teachers on M3.2.

We simply ran out of time and couldn't do everything. I tried to include some of the activities from this LE along with other LEs. We used a couple of the BLMs from this LE in earlier activities.

M3.3 *The Survey Says...?*

M3.3 is a learning experience that provides strategies for students to survey, gather data, and display their data in an effort to help them analyze people's commitment to changing their

actions and taking responsibility for climate change. Of seven respondents, only four used this LE, however five plan to use it with next year's students, and six would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M3.3.

Again, we ran out of time. We discussed some of the ideas of this LE, but not in great depth. We did create a mascot, logo, slogan, and motto for our Awareness Evening, but they were not computer-generated. We did this as an art project.

It was interesting how some of the students were taking our discussions home and sharing their new found awareness with their family.

The posters are a great resource for this activity.

M3.4 On the Other Hand

M3.4 is a learning experience that provides strategies for students to prepare and conduct town hall meetings, to discuss the climate change issue and to come to a consensus. Of seven respondents, only three used this LE, citing lack of time and poor connectivity as barriers.

Following are the comments of the IMYM pilot teachers on M3.4.

We used a couple of the BLMs as a guide for oral reports, but we didn't use it with this LE. We discussed the different "sides" of some environmental issues, but again, some things had to be left out and this was one of ours.

Frustrated with the Internet connections. I do not see this getting better in the near future. This activity would work well with reliable connectivity.

M3.5 Caring for the Earth

M3.5 is a learning experience that provides strategies for students to use storytelling or puppet plays of children's literature to share important factors in caring for the earth. Of seven respondents, five used this LE and plan to use it with next year's students. Following are the comments of the IMYM pilot teachers on M3.5.

The students wrote skits and acted them out. We video taped the skits and showed the tape at our Awareness Evening.

Plan to do this later on in the year. The students will enjoy this LE.

We ran out of time. We will be completing it later.

Next year I would like my students to present puppet shows to the k-3 classrooms; each classroom one at a time.

M3.6 *We All Can Make a Difference!*

M3.6 is a learning experience that provides strategies for students to collect previous work already completed to create products to educate others about how we all can work together to make an impact on climate change. Of seven respondents, six used this LE, plan to use it with next year's students, and would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M3.6.

Enjoyed this!

We used one of the BLMs, but with an earlier LE. This was a good re-cap of the unit.

The students found the preparing for Climate Awareness Week the Climax of the unit. They were self directed and completed a great job well done.

We are not finished. A lot of stuff has to be restarted as it was lost when the server died.

4.2.6 Module 4

Module 4 is titled, "*Climate Change Kids' Club in Action*" and is composed of two learning experiences

- M4.1 *Climate Change Awareness Week*
- M4.2 *Looking Back...Looking Ahead*

Each learning experience has a specific purpose that provides strategies for students to culminate, share, and celebrate their investigation into climate change. Similar to the OLEs, ICTs, and Modules 1-3, Module 4 provides instructional strategies as well as necessary student

learning resources (e.g., BLMs) to help pilot teachers and their students to successfully complete the learning experiences.

The analysis of each question from the online feedback forms is found in Appendix G. Listed below is the commentary provided by the pilot teachers on each learning experience in Module 4.

M4.1 *Climate Change Awareness Week!*

M4.1 is learning experience that provides strategies for students to complete the planning, and to create and host a *Climate Change Awareness Event*. The LE is the culminating task of the entire interdisciplinary unit. Of six respondents, four used this LE, five plan to use it with next year's students and all would recommend it their colleagues. Following are the comments of the IMYM pilot teachers on M4.1.

I'm disappointed! I did what I could, with the make-up of class and their characteristics. Moving from Grade 4 to Grade 5 is a big adjustment for some students and bigger adjustment for parents. Helping parents adjust from Early Years to Middle Years and Grade 5 content was and still is ongoing. Class disruptions, class activities, school activities, timetabling, time class out of classroom effects progress and accomplishments. "Do what you can with what you have within a set time." "Life is too short! Embrace what you can when you can."

This was a great module.

I was a bit nervous about the whole "Awareness Evening" thing, but it really went well. I would definitely do it again.

This event went over well with the local community.

Hopefully, we will do this module in late March.

This learning experience really helped to keep you organized.

M4.2 *Looking Back...and Ahead*

M4.1 is a learning experience that provides strategies for students to reflect on their learning, and set goals to continue to take action against climate change. Of six respondents, only three used this LE. However, five plan to use it with next year's students and would recommend it to their colleagues. Following are the comments of the IMYM pilot teachers on M4.2.

Looking back, looking ahead! Next year will be different. Gives a lot to think about - changes to be made.

We never were able to access the Climate Change Challenge during school hours. Only a few kids tried the practice quiz at home. I kept trying the site during the day until we got heavy into planning for our Awareness Evening. About that same time, the kids forgot about the CCC or they gave up on this activity, so we just let it die...maybe next year.

The group this year is extremely weak academically and very slow when doing assignments (many basic skills are still missing). The majority of my students are below average in reading comprehension in both languages. Many were placed in Grade 5 with the expectation that they would receive as much resource time as they had last year. Unfortunately, they received very little help from resource. It takes them three times the amount of time to finish something that groups from previous years had taken. It has been difficult working on this project. However, they have made much progress in technology and their organizational skills have greatly improved because of this project.

Students really enjoyed seeing how much they had learned and seeing how much of a difference is being made in our classroom, our school, and our homes.

4.2.7 Key Findings-Online Feedback Forms

The detailed analysis of each feedback question for the OLEs and ICTs are situated in Appendix C and Modules 1-4 are in Appendix D, E, F and G respectfully. It was decided at the follow-up meeting in February 23, 2004, with the majority of the IMYM pilot teachers present, which OLEs and ICTs should be kept and which ones should be eliminated. The IMYM pilot teachers decided to keep the majority of OLEs and ICTs with the exception of ICT.10 *Finding It* and ICT.11 *Making It*. It was felt by the majority of the IMYM pilot teachers that the technical

skills to create a website did not yet exist with Grade 5 students and most students already had acceptable understanding of Web Quests.

Pilot teachers also decided to move the Big Picture out of Module 1 and to make it into separate component of the unit. The number of LEs in each module was reduced and the culminating task was changed from a *Climate Change Awareness Week* to a *Climate Change Awareness Event*.

4.3 Learning Journals

This section of the report is dedicated to the written word of the IMYM pilot teachers. At the follow-up meeting (February, 2004), the attending pilot teachers were asked to write their final thoughts and reflections on how their implementation of the IMYM model had changed themselves, their relationships with colleagues, and their classroom/students. For the majority of the IMYM pilot teachers, there was significant change in thinking regarding their personal and teaching styles. Due to the sensitive nature of some of the reflections, the names of the IMYM pilot teachers have been withheld.

4.3.1 Thoughts on Myself

For this section, teachers were asked the following three questions. Here is a list of some of their reflections.

Question #1: What content and skills am I learning?

I continue to learn more about Grade 5 content and the IMYM model everyday. I am learning to step outside the box and experiment with new ideas and strategies. I try not to be intimidated by technology but to use it as a tool to help me and my students

I have learned that I have acquired new skills using the IMYM model

Over the course of the IMYM pilot I have learned a lot about the concept of climate change. I find this topic interesting and something that can be followed and discussed on a daily basis. I have also expanded my knowledge in the technology area. I still have much to learn but will continue to work at improving and expanding my skills.

I have definitely discovered my abilities as well as my limitations. I have to decide what it is that I want to accomplish and set time limits. I can not spend a lot of my own time at work or I get worn out. To keep motivated and positive for my students I need to be rested and content outside of the school day. I realized how easy it is to get involved in technology and to love it. I feel much more comfortable with it and have even offered to teach other staff how to use technology in the classroom. This pilot has been a very positive growth experience for me. I do feel that I grew from the experience but because I didn't finish I don't feel I was of any help to others in the pilot. I very much appreciate those that were more capable of helping out the rest of us!

I have been learning a great deal about climate change in itself. Through my own interest level I have been encouraging the students to become global citizens and learners. I have been learning new Grade level material (i.e. weather and how it all relates to the IMYM topic of climate change. The "content" is huge and breaking it down into workable areas within the children's learning has been challenging.

Question #2: What am I learning about myself as a teacher?

I have grown much as a teacher this year. For the first time in my 13 year career I actually love my job (or at least most of the time). I feel like I have the potential to be successful in this position and am eager to implement the IMYM model. Along with this excitement and motivation, I need to continually remind myself to do what I can and not let that overwhelming feeling take over. I need to assess what is working, and get rid of what is not, rather than just getting caught up in the rush of the days and weeks. Take more control, as well as rolling with the punches more. Finding Balance. I also need to take care of me first, in order to have more to give my students and my family. That self-care piece is often missing, which alters my effectiveness as a teacher/mother/wife (not necessarily in that order.)

As I look through these comments, I realize that I am often very hard on myself. I do not easily notice the positive aspects of the things that I do. I usually notice what did not go well in an attempt to improve this area. As a learner, I am finding out that there is still a lot to learn. I enjoy new challenges and new ideas. I like to look at possibilities and creativity.

Doing this unit reaffirms that I am flexible. It is interesting that in all the positions I have had that this is a necessary requirement. I am a risk taker and enjoy

challenges. I'm a problem solver and will work at resolving issues. I research ways to improve student learning and to better my instruction.

I learned that I can guide and let the learning go on. In the end we discuss and readjust if needed. I have let go of the control and I have transferred that to my students. They have become partners in the decision making and they are engaged learners.

I know I'll be using computers FOR learning in my classroom from now on and not just to type out the final copy of a report or project so that it looks nice. I've used themes in the primary grades and have integrated all subjects into that theme, but not to this extent, and certainly not for this length of time. I will not be so hesitant to attempt integration on a larger scale in the future. I like to think that I am changing with the times and not becoming a dinosaur of sorts, and integrating more technology into my teaching seems like a natural thing to do.

Skills that I have learned are how to better focus a chatty group of students, How to assess these same individuals fairly so that they are not always falling under the category of "collaborative" but also individuals. I have increased my own technology skills and can now easily find, save, and share files that before I thought were cemented into a program. For example, within the Canon program, I was having difficulty transferring images to other multimedia programs. I was able to realize two things, one being the program has its own slideshow within, and also how to export large amounts of images all at once rather than saving them one by one. I have also learned about the program called Pinnacle and how I can begin using a video editing program with in my room. In the past I have used "Lego animation" which taught me the basics of editing but this program is more advanced. It has also encouraged me to upgrade my technology at home. PowerPoint skills are now stronger than before as are Inspiration. I still like to use HyperStudio but this is not popular in our division.

My big disappointment was webpage design. I was really looking forward to this but was not allowed to have it installed on our computers in the room due to copyright. I'm still working on this and want to have a webpage up and running by June. I have most of our stuff on the school webpage. Another skill I have learned is the budgeting and cost of certain things going into a project such as this. If you want things published on paper then there had better be money for paper and cartridges etc. Fieldtrips are another expense but very valuable. I am learning as a teacher that I must spend my free time becoming familiar with the content. It is very difficult to "wing it" in a computer lab with 24 faces ready to learn PowerPoint. Time management is always difficult especially when you have young children at home. A great deal of my prep time was between 10 and midnight. Getting to school early to set up was also another challenge that I addressed throughout the project. I also learned that I like to move fast and there were times it was not possible. Wasted time in the lab really held some groups

back and from time expectations. I learned that I really need rubrics and assessment tools to keep myself from moving too far off of the beaten track.

Question #3: How is my role as a teacher changing?

My role as a teacher is changing in the way that I have had to give up some "control" and let students do some of the leading. There is always room for more growth. Some areas I have continued to apply my skills, but I have improved in my knowledge and use of spreadsheets, Internet use, networking, word processing. I need to continue to work on my use of digital imaging, video, and spreadsheets to feel I have really mastered them.

I have started to give students more responsibility for their learning and I have let go some of the formalities in order to give them more space. The students are much more successful. I have also guided a student teacher who found that the program was very demanding.

I tend to encourage my students to take risks, to challenge the conventional ways of looking at and of doing things. I find that as a teacher, I do not like to become stagnant and unmoving in my learning and teaching environment. I look forward to implementing new strategies for my classroom. I encourage the seeking out of new and innovative ideas.

My role is to foster independence and provide students with many opportunities to learn the skills they need to work cooperatively with others. I have learned to focus on student strengths and not their weaknesses.

I have learned to let the students be the teachers when it comes to the technology piece as some of them have discovered things that I don't know about. They are also able to communicate to fellow students in a more effective way in some cases about how to do something new.

My role as a teacher in the IMYM model has changed from being the giver of information to the facilitator in the students learning process. I have become in some aspects the monitor of the students learning and observer. There was so much to do with the students to get ready for this unit, and it all had to be done early in the year. This was quite a change for me because I usually teach them computer skills throughout the year, and this year it was "September heavy". Skills for working in groups also had to be emphasized early in the year, and for some, patience and tolerance has had to be encouraged on a regular basis. One of the best parts of having completed the unit in the first half of the year for me is that the kids have so many computer skills that they otherwise wouldn't have, and they can use them throughout the year.

I am happy with the progress I have made this year as a teacher. Because I have such a difficult group of students I have found myself developing stronger classroom management skills. I see the kids coming a long way from where they were in September with respect to their behaviour and how they get along with others that I know my hard work has paid off with the help of some great educational assistants. Things that would bother me in the past with respect to how a classroom ran didn't bother me this year. For example, having students working on several different things at the same time and having no specific "task" (if that makes any sense), plenty of movement amongst the students and well as noisy room. Although the noise level has increased as I circulate, I can see that learning is taking place and I have no need to be concerned.

4.3.2 Thoughts on My Relationship with My Colleagues

Question #1: In what ways am I collaborating with other colleagues?

I encourage others to take risks and to be open, flexible and adaptive. A person has to develop these skills in order to keep learning through out different phases of their lives. I'm a go-getter and I like to plant ideas in others so as to encourage them to keep current. I am definitely a life long learner and I intend to continue. I need to be challenged and I like to challenge my students, my peers and my family.

I am very much an interpersonal worker. Collaborating with my colleagues is a motivator for me, and helps to keep me on track/not so overwhelmed. I feel very fortunate to have had the opportunity to work with the CC Pilot teachers and have learned much from them. I have a good support network developing in my school (or will once our Grade 6 teacher returns from maternity leave.), and am looking to establish a support network within our division. Teaching is such an isolated job. You are in an ocean of people, and don't seem to have a moment to yourself - but at the same time are disconnected from other adults in your building/profession. Finding like-minded colleagues has been such a factor of growth, and has helped me "stick with" things when I could have easily thrown in the towel. I love the IMYM Online Learning Community, and would love to see our division access its potential. It is exciting to be involved with the IMYM model, and I love sharing its message and my experiences with others.

I have shared with them BLMs, ideas, TBLMs, given little tid bits about what worked and didn't, doesn't. How am I mentoring my colleagues? I give them technical support and suggestions, ideas, share the learning.

I believe in the collaborative learning model. I can not stress enough to my staff that we are all needed to make things work. This approach however is a challenge in a small school situation when some staff doesn't readily like to share. This then

forces me to look at new ideas, directions, etc. to get all parties involved because if I don't it appears that I would do all the talking...very team approach oriented.

Cooperation. I have shared many of the ideas for technology use in classrooms. My students had the opportunity to teach others. It worked better than expected and students felt good about themselves. It has opened up some lines of communication and sharing of ideas.

I quickly discovered that everybody at work is very busy; however when I needed help someone would come ...eventually. My principal was very accommodating and would contact the division computer tech. whenever I needed her. She will be coming to help me set up a classroom web site. There are a lot of knowledgeable people on staff.

Question #2: How am I mentoring my colleagues?

I have worked side by side with my fellow Grade 5 teacher who is very experienced with the IMYM Prairie Tour interdisciplinary unit. She has been a great resource and support. She reminds me that this is my first year and after 5 years of teaching using the IMYM model she is still learning and finds it overwhelming. We will continue to work through IMYM together as we are beginning Prairie Tour next month.

I have enjoyed reading what other colleagues are doing and trying to implement some of their ideas. I find that this is a very rich experience. I needed to be reading that I was not the only one with difficulties and learned from others in the process. I have since been giving mini-workshops to my middle years colleagues on reading circles, editing, and other ideas from the model. There was a lot of interest in what I was doing and many teachers asked questions in order to gain knowledge of what worked for me. I've shared my successes and my difficulties and have advised to adapt and not adopt because we always need to start with the students in front of us and their abilities.

There have been dramatic changes among the staff this year. They are so much more open to trying out new things. They are using the computer labs for more things than just playing games. They are actually starting to integrate technology and curriculum. They are also more eager to ask for help from others. It is refreshing to see different grade levels attempting integration and actually doing mini-projects. It is a step forward. Staff members are more open to new ideas and new ways of teaching. It is also great to have different staff members consult and organize multi-grade projects. This was not attempted previously. Students are more involved in preparing presentations for assemblies. Teachers are handing the reins to students. They are more like facilitators now.

They remain pretty much independent of others activities. I have offered to give workshops throughout the year but they are not interested (computer shy). I have

given a brief demo on digital cameras at a school in-service. Not really a sharing school.

4.3.3 Thoughts on My Classroom

Question #1: How is my classroom changing physically and functionally?

I have introduced the strategy of learning centres using the aid of my resource teacher when she is available. Students are now used to this routine and know what is expected. My students' desks are set up in pods so they are ready for group work and learning centres. Students are enjoying learning centres and working with their peers. They are eager to learn new computer skills and test out what they have been taught. I now have 5 computers located in my classroom that are used regularly by the students.

Group work, integrating technology, learning centres, flexible grouping, differentiating instruction, multiple intelligences are all crucial components of my classroom on a daily (or almost) basis.

It changes on need, opportunity, and activity. My class is getting used to the movement back and forth from groups, to traditional setting.

I strive to create a group of independent thinking learners and allow for student leadership. By having students interacting and peer tutoring they are learning so much more. We are probably the noisiest classroom in the building and interaction is a big focus for us. Students have taken great responsibility and maintain the classroom environment and take responsibility for it as their own. Great when I'm not there.

Question #2: What is the impact of IMYM on my classroom practice?

There is a lot to think about for next year.

The IMYM model is a very collaborative and hands on model. My classroom has become a very collaborative and hands on place. The walls are full of words, questions and visuals which reflect our learning. Students are coming and going since we use the computer lab, the library as well as the classroom to work in. It has given me a chance to work with the students who are having difficulties and putting strategies in place to help them. My classroom has become a learning lab. Teachers, students, parents, administrators and the community were all involved in the sharing and celebrating of our ideas and knowledge based on good sound research and exploration.

Learning centers, learning centers, learning centers! Classroom set up is also very important. It is nice to have two computer workstations. It is easier to keep students focused. In learning stations, students need room to experiment and learn.

Question #3: How are my students responding?

Whenever students have extra time they are asking if they can do a PowerPoint presentation or some kind of computer project. It's great to see their enthusiasm.

Some students cope better than others. Students like regular routine. They like the structure.

My students have made so much progress this year. Yes they are still very weak academically. But not everything in life centres on the academic content. They have greatly improved in problem solving skills, collaborative skills and organization skills. They will benefit from these skills more in life than learning content material they wrote. They, as a group, were not really into reading but they have improved in this area. They are reading more and are choosing better reading material. They have really opened up and they are able to give their opinions on things. They are better thinkers now. They also were more adept at inference and can see cause and effect better. They are much more organized and cooperative than in September. They are eager to learn and accept others more easily. They share with others more easily and this will help them in the workforce later. Their use and understanding of technology has improved greatly. They are still a weak group academically but they have acquired the necessary skills that will lead them to success.

It is so nice to see students starting to guide their own learning and taking responsibility for their work.

I like to change my classroom - and often. I think it's good for the kids to sit near different kids throughout the year. Depending on what's happening in class at the time, we sit in rows, partners, groups, etc. However, with a large number of students in my classroom, we can only make so many physical changes. Students look forward to changing where they sit from time-to-time, and I think it makes them more aware of others' needs in our class. My class loved doing the IMYM project and their parents were all very supportive. They use their computer skills nearly every day for one thing or another.

My students took some time to become comfortable with the use of the camera and the computer. They had a difficult time with the cooperative approach. When I focused more on teacher-directed instruction and slowly incorporated the group work it worked a lot better. They needed the down time to get them on track every

now and again. Over time they became more aware of the concept, but it took some time and a lot of review. It was definitely a challenge for them.

4.3.4 Key Findings-Journal Entries

Summarizing the reflective online journal entries, several key findings can be extrapolated. Although this can not be generalized to every pilot teacher involved, the IMYM

Climate Change pilot study

- Helped some pilot teachers to alter their teaching style
- changed some of the pilot teachers' perceptions regarding their role as a teacher
- increased the job satisfaction of some of the pilot teachers
- helped some of the pilot teacher acquire new teaching skills
- provided pilot teachers the opportunity to participate in professional learning
- increased the technical knowledge and skills of some of the pilot teachers
- increased the pilot teachers and students' knowledge about climate change
- increased the classroom management skills of some of the pilot teachers

4.3.5 Key Findings from Follow-Up

The follow-up professional learning experience session on February 23, 2004, provided the necessary time for the IMYM pilot teachers to reflect on their experiences, share with colleagues, and analyze the pilot study to make suggestions for improvement. Four main themes were considered.

- IMYM model
- *Climate Change* Interdisciplinary Unit
- ICT integration
- IMYM Online Learning Community.

After discussion and brainstorming, the pilot teachers listed the following successes and challenges of each of these four themes.

Successes of the IMYM Model	Challenges of the IMYM Model
<ul style="list-style-type: none"> • skills developed through OLEs and ICTs • availability of technology • motivation • upgrade in technology • awareness celebrations • student interest • relevant concept – current and ongoing • having the resources and then adapting them for students and classroom 	<ul style="list-style-type: none"> • technology glitches • finding current resources • money • student levels of ability • interruptions • length – too long (have options) • prior knowledge needed • pre-teaching of content (sort & predict) • time of year to start (do after Christmas) • overwhelming / getting behind • feeling free to do what worked for you • difficulty of some concepts

Table 29: The IMYM Model

Successes of ICT Integration	Challenges of ICT Integration
<ul style="list-style-type: none"> • more use of the computer • students as peer tutors • student excitement over new ICT discoveries • feeling of accomplishment • staff using technology • better use of computer lab • sharing of ideas • “throws light on weaker students” ...gives value • increased collaboration • increased organization • student (peer) accountability • cameras for visualization • using email to send materials • PowerPoint, <i>Inspiration</i>, electronic portfolios, videos, Excel spreadsheets 	<ul style="list-style-type: none"> • technical difficulties • different ICT skills levels • availability of computers • individual computer time • getting students to enter data or content on projects (adding “information”) • time constraints • group dynamics • Internet connectivity • losing files (electronically)

Table 300: ICT Integration

Successes of the IMYM Online Learning Community	Challenges of the IMYM Online Learning Community
<ul style="list-style-type: none"> • nice to see where everyone else was at and doing • were able to pace ourselves • sharing ideas and classroom pictures • implementing others’ ideas • helped to focus on week’s activities • nice to have “peer support” • easy to access 	<ul style="list-style-type: none"> • difficult to maneuver • chat room needs to be able to minimize participation • filling all the sections out (repetition) • too many different places to go – “time” • unable to download • lack of technical support (from within the school) • difficulty chatting with others (schedule) • time consuming

Table 311: IMYM Online Learning Community

5.0 Conclusion

The IMYM *Climate Change* pilot study occurred throughout the 2003-2004 school year with fifteen original pilot teachers. The IMYM pilot teachers were selected from various communities across both rural and urban Manitoba. Two face-to-face professional learning sessions were provided in August, 2003, and February, 2004. The goal of the professional learning sessions was to familiarize the pilot teachers with the IMYM model and the *Climate Change* interdisciplinary unit. Another aspect to the professional learning sessions was enabling and supporting teacher collaboration, the majority of which occurred within the IMYM Online Learning Community.

Based on the qualitative and quantitative data collected from this study, the *Climate Change* pilot study was successful. With only minor revisions required for future years, interested teachers in Manitoba can look forward to participating within the IMYM Online Learning Community and to implementing the *Climate Change* interdisciplinary unit. The key findings of this pilot study demonstrate that ICT was effectively and efficiently integrated into curriculum and classroom practice with numerous instances of its positive impacts on both teaching styles and learning.

References

- Bitner, N., & Bitner, J. (2002). Integrating Technology into the Classroom: Eight Keys to Success. *Journal of Technology and Teacher Education*, 10(1), 95-100.
- Bliss, T. J., & Bliss, L. L. (2003). Attitudinal responses to teacher professional development for the effective integration of educational technology. *Journal of In-Service Education*, 29(1), 81-99.
- Brown, A. L., & Campione, J. C. (1994). *Guided discovery in a community of learners*. Cambridge, Massachusetts: MIT Press.
- Burbank, M. D., & Kauchak, D. (2003). An alternative model for professional development: Investigations into effective collaboration. *Teaching and Teacher Education*, 19, 499-514.
- Clark, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education*, 18, 947-967.
- Committee on Developments in the Science of Learning (Ed.). (2000 as cited in Newhouse, December 2002). *How People Learn: Brain, Mind, Experience, and School*. Washington, D.C.: National Academy Press.
- Craft, A. (2000). *Continuing Professional Development: A Practical Guide for Teachers and Schools* (2nd Ed.). London: Routledge/Falmer.
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915-945.
- Geelan, D.R. (1997). Epistemological anarchy and the many forms of constructivism. *Science & Education*, 6(1-2): 15-28.
- Government of Canada (2004). *How will climate change affect us?* Retrieved May 13, 2004 from: <http://www.climatechange.gc.ca/english/affect/>
- Grantastic Designs. *5 basic rules of web page design and layout*. Retrieved May 13, 2004 from: <http://www.grantasticdesigns.com/5rules.html>
- Howard, B. C., McGee, S., Schwartz, N., & Purcell, S. (2000). The experience of constructivism: Transforming teacher epistemology. *Journal of Research on Computing in Education*, 32(4), 455-466.
- Interdisciplinary Middle Years Multimedia (IMYM). *About the Climate Change Pilot*. Retrieved March 21, 2004 from: http://percival.merlin.mb.ca:8900/SCRIPT/imym_climate_change/scripts/serve_home
- *Climate Change Concept Maps*. Retrieved March 16, 2004 from: http://www.edu.gov.mb.ca/ks4/tech/imym/teacher/cc_conceptmaps.html
 - *Frequently Asked Question (FAQ)*. Retrieved March 16, 2004 from: <http://www.edu.gov.mb.ca/ks4/tech/imym/faqs/imym-model.html>
 - *Glossary*. Retrieved March 12, 2004 from: <http://www.edu.gov.mb.ca/ks4/tech/imym/faqs/glossary.html>
 - *Hardware Model*. Retrieved March 10, 2004 from: <http://www.edu.gov.mb.ca/ks4/tech/imym/pilot/cchardware.html>
 - *Pilot Overview*. Retrieved April 04, 2004 from: <http://www.edu.gov.mb.ca/ks4/tech/imym/pilot/ovrview.html>
 - *Research Results*. Evaluation Report for the Grade 5 IMYM Pilot. Retrieved April 10, 2004 from: <http://www.edu.gov.mb.ca/ks4/tech/imym/results/evaluat.html>

- *Software Model*. Retrieved March 10, 2004 from:
<http://www.edu.gov.mb.ca/ks4/tech/imym/pilot/ccsoftware.html>
- Jonassen, D. H. (1996). *Computers in the classroom: Mindtools for critical thinking*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- (2000). *Computers as mindtools for schools: Engaging critical thinking*. In (2nd ed. ed.). Upper Saddle River, N.J.: Merrill-Prentice Hall.
- Manitoba Education, Citizenship and Youth. *Curriculum*. Retrieved March 31, 2004 from
http://www.edu.gov.mb.ca/ks4/cur/english_pr.html
- Martinello, M. L., & Cook, G. E. (2000). *Interdisciplinary inquiry in teaching and learning*. Upper Saddle River, New Jersey: Prentice Hall.
- McGrath, B. (April 1998). Partners in learning: Twelve ways technology changes the teacher-student relationship. *The Journal Online*, 25(9).
- Newhouse, P. C. (December 2002). *Literature review: The impact of ICT on learning and teaching* (Document): Specialist Educational Services. Department of Education and Training, Government of Western Australia. Retrieved June 01, 2004 from:
<http://www.eddept.wa.edu.au/cm/eval/pd/reading/reading1.htm>
- Nisan-Nelson, P. D. (2001). Technology integration: a case of professional development. *Journal of Technology and Teacher Education*, 9(1), 83-103.
- OFSTEAD. (May 2004). *ICT in schools: The impact of government initiatives five years on*. (Report). Retrieved June 02, 2004 from:
<http://www.ofsted.gov.uk/publications/index.cfm?fuseaction=pubs.summary&id=3652>
- Panitz, T. (1996). A definition of collaborative vs. cooperative learning. Retrieved May 10, 2004 from: <http://www.city.londonmet.ac.uk/deliberations/collab.learning/panitz2.html>
- Peterman, F. P. (1993). Staff development and the process of changing: a teacher's emerging constructivist beliefs about learning and teaching. In K. Tobin (Ed.), *The practice of constructivism in science education* (pp. 227-245). Washington, D.C.: AAAS Press.
- Ping L, C. & Yong T. L. (2003). Information and communication technologies (ICT) in an elementary school: Students' engagement in higher order thinking. *Journal of Educational Multimedia and Hypermedia* 12(4), 425-451. Retrieved May 29, 2004 from: <http://80-dl.aace.org/login.ezproxy.library.ualberta.ca/14210>
- Plante, J and Beattie D. (2004). Connectivity and ICT integration in Canadian elementary and secondary schools: First results from the Information and Communications Technologies in Schools Survey, 2003-2004. Retrieved May 15, 2004 from:
<http://www.statcan.ca/cgi-bin/downpub/listpub.cgi?catno=81-595-MIE2004017>
- Roberts, J. M., & Porter, D. (1999). *Integration of information and communications technologies (ICTs) through teacher professional development: Issues and trends in Canada*. Toronto: Council of Ministers of Education, Canada.
- Scardamalia, M. and Bereiter, C. (1994). Computer support for knowledge-building communities. *The Journal of the Learning Sciences*. 3(3), 265-283.
- Schlager, M. S., & Fusco, J. (2003). Teacher professional development, technology, and communities of practice: Are we putting the cart before the horse? *The Information Society*, 19, 203-220.
- Stallings, L., & Koellner-Clark, K. (2003). Re-creating graduate teacher education classrooms: Multiple technology formats and collaborating instructors. *Journal of Technology and Teacher Education*, 11(4), 501-514.

Telus Learning Connection (Telus2Learn). *Assessment in a Collaborative Classroom*. Retrieved May 02, 2004 from: <http://www.2learn.ca/projects/together/classroom.html>

Yamagata-Lynch, L. C. (2003). How a technology professional development program fits into teachers' work life. *Teaching and Teacher Education*, 19, 591-607.

Appendix A: Self-Assessment of Pedagogical Skill in Integrating ICT with Curriculum and Classroom Practice

Level	Beginning	Developing	Accomplished	Exemplary
Pedagogy Skill				
I. Using <u>Educational Software</u>	<input type="checkbox"/> I do not use educational software, such as drill and practice, simulations, and tutorials as part of my instruction. However, I am aware of some titles that may help my students meet their learning goals.	<input type="checkbox"/> I use some educational software as an instructional supplement, or for children with special needs.	<input type="checkbox"/> I use educational software that has been evaluated as a learning resource to match outcomes in Manitoba Foundation for Implementation documents. I use these resources to provide experiences otherwise unavailable to my students and to address diverse learning styles.	<input type="checkbox"/> I seek out new educational software for evaluation and adoption. I access sources of software reviews and keep current on developments in educational technologies through professional reading and conference attendance. I share my findings with my colleagues.
II. Using <u>information and communication technology to improve student writing</u>	<input type="checkbox"/> I do not use any technologies that would allow me to help my students improve their writing skills. However, I ask that the final draft of some student writing assignments be word processed.	<input type="checkbox"/> I encourage my students to use <u>concept mapping</u> to activate their prior knowledge as they write. I expect my students to compose or edit using the computer. I ask that the final draft of most student writing assignments be word processed.	<input type="checkbox"/> I help my students use technology in all phases of the writing process from brainstorming and outlining to writing and editing. This may include concept mapping software, spelling and grammar checkers, electronic dictionary and thesaurus, desktop publishing tools, and the use of hand held devices and portable computers.	<input type="checkbox"/> I store collections of my students' writing electronically. I use technology to help students share their writing with a wide reading audience. I look for specific technology tools to help my students improve their writing skills. I share successful strategies with colleagues through print and electronic publishing and through conference presentations and workshops.

Level	Beginning	Developing	Accomplished	Exemplary
Pedagogy Skill				
III. Teaching information literacy skills using resource- based learning	<input type="checkbox"/> I am not familiar with the term information literacy, and I am not sure why such skills are important.	<input type="checkbox"/> As a part of my instructional strategies, I have students engage in resource-based learning projects where information literacy skills are developed. My students use and cite electronic resources in the resource-based learning process.	<input type="checkbox"/> I collaborate with a teacher-librarian or with other classroom teachers to teach information literacy skills. I design resource-based learning projects so that students ask essential questions , use higher-level thinking skills, use and cite electronic information sources, use computer productivity software, and are authentically assessed.	<input type="checkbox"/> I am actively involved in curriculum implementation teams in my school or division and advocate for and use interdisciplinary units, web quests , and learning experiences that develop information literacy skills and resource-based learning. I share successful units with colleagues through print and electronic publishing and through conference presentations and workshops.
IV. Teaching information literacy skills using primary sources	<input type="checkbox"/> When asking students to do research, I expect them to only use secondary resources such as books, magazines, or reference materials.	<input type="checkbox"/> As part of my instructional strategies I include student projects that require the collection and use of original data and information. I generally can predict the outcome of such experiments or surveys.	<input type="checkbox"/> I expect my students to participate in information literacy projects that require the collection of original data to answer a real-world question. They use a variety of tools to gather data, such as online surveys, interviews, digital cameras, digitized sources of historical records, computerized probes and sensors, or GPS devices. I teach my students to use electronic tools such as tables, spreadsheets, or databases to record, organize, analyze and communicate the results.	<input type="checkbox"/> I am actively involved in curriculum implementation teams in my school or division and advocate for and use interdisciplinary units and learning experiences that require information literacy skills and the use of primary sources of data. I share successful strategies with other teachers through print, electronic publishing, conference presentations, and workshops.

Level	Beginning	Developing	Accomplished	Exemplary
Pedagogy Skill				
V. Differentiated Instruction	<p><input type="checkbox"/> I rely on a few effective methods of delivering content to my students. I do not use technology that requires that I change my instructional methodology.</p>	<p><input type="checkbox"/> I have tried learning experiences that have a technology component, however, I primarily use teacher-directed, whole group instruction. I occasionally give my students a choice of assignments.</p>	<p><input type="checkbox"/> I use a variety of instructional delivery methods and student grouping strategies routinely throughout the year. I design learning experiences and approaches that best fit curricular learning outcomes, student learning styles and needs, and the technology available to me. I use small groups working collaboratively in learning centres to take advantage of student-to-equipment ratios of greater than one-to-one.</p>	<p><input type="checkbox"/> I continually try new approaches suggested by research or observation to discover the most effective means of using technology to engage my students and meet curricular outcomes. I work with a team of like-minded teachers either face-to-face or online to create, modify, and improve my practices in instructional delivery.</p>
VI. Assessing student performance	<p><input type="checkbox"/> I assess my students using primarily summative and objective written tests. I assess some student performances or products using formative and subjective criteria. I am aware that ICT can be used to assess student achievement.</p>	<p><input type="checkbox"/> I gather evidence of student learning and collect print copies of electronic work (such as word-processed documents, graphics, and presentations) to demonstrate student achievement in student portfolios and parent conferences.</p>	<p><input type="checkbox"/> I use a wide range of assessment strategies to evaluate student products and performances. I create assessment tools such as checklists and rubrics that help students assess themselves and their peers and allow me to objectively determine the quality of student work. I ask students to keep both a physical and electronic portfolio of their achievements. I have a computerized means of aggregating performance data for my class that I use to modify my instructional strategies.</p>	<p><input type="checkbox"/> I have developed strategies to assess both interdisciplinary work and collaborative work. I continuously try new strategies suggested by research or observation to discover the most effective means of using technology to help assess student learning. I work with a team of like-minded teachers, in person or virtually, to create, modify, and improve my assessment practices.</p>

Level	Beginning	Developing	Accomplished	Exemplary
Pedagogy Skill				
VII. Using technology for professional research and communication	<input type="checkbox"/> I do not use information and communication technologies for professional research or communication.	<input type="checkbox"/> I use online tools to find learning experiences, learning resources, and promising practices for my classroom. I correspond electronically with other educators.	<input type="checkbox"/> I access specialized databases such as ERIC, CBCA, and EBSCO to research educational topics. I read electronic newsletters and journals.	<input type="checkbox"/> I participate in electronic discussion groups or chat rooms related to my area of expertise. I use electronic tools when giving workshops or speaking at conferences. I organize professional learning opportunities for other teachers and feel comfortable teaching colleagues how to use technology to enhance instruction.
VIII. Researching and reflecting on the use of technology in education	<input type="checkbox"/> I am uncertain whether the use of information and communication technology would make a difference in my students' learning or in classroom climate.	<input type="checkbox"/> I gather, and share with colleagues, anecdotal information and observations about how students use technology to learn in my classroom.	<input type="checkbox"/> I analyze and self-reflect on how the technology and methodology I use affects my students' learning and the climate of my classroom. I use the results of others' research on ICT integration to inform my own classroom practice.	<input type="checkbox"/> I have designed action research as part of my own professional learning. I report electronically, in person, and in print, the findings of my research, to other professionals.
IX. Engaging in online professional learning	<input type="checkbox"/> I am aware that professional learning is available online.	<input type="checkbox"/> I have participated in online professional learning but it did not involve online discussions and posting of student samples.	<input type="checkbox"/> I have taken at least one online professional learning course in which I engaged in online discussions. I shared online samples of my work and/or digital photos of my classroom with the other teachers in my online learning community.	<input type="checkbox"/> I engage in a variety of online professional learning experiences in addition to online courses, including web casts, online conferences, and web logs.

Level	Beginning	Developing	Accomplished	Exemplary
Pedagogy Skill				
X. Setting up my classroom	<p>□ My classroom is set up primarily for independent learning. There are no computers in my classroom. Most of my use of technology with students is scheduled in a computer lab.</p>	<p>□ My classroom is set up to accommodate occasional collaborative learning. I have at least one computer in my classroom but it is not connected to the Internet.</p>	<p>□ My classroom is often set up to accommodate collaborative learning. I create learning centres that often have computers or other technology in them. At least one classroom computer is connected to the Internet.</p>	<p>□ My classroom is set up with learning centres for both collaborative and independent learning. My students use classroom computers throughout the day whenever they need to do Internet research or create an electronic product.</p>

*Adapted from Rubrics to Guide Professional Technology Development by Doug Johnson, Learning and Leading with Technology, Volume 28 Number 4, December/January 2000-2001

Appendix B: Self-Assessment of ICT Literacy

Level	Beginning	Developing	Accomplished	Exemplary
ICT Skill				
I. Computer operation	<input type="checkbox"/> I do not yet use a computer.	<input type="checkbox"/> I understand how to use a computer to run specific, pre-loaded software.	<input type="checkbox"/> I can set-up my computer and peripheral devices, load software, print, and use some of the operating system tools such as the Find command. I customize the look and sounds of my computer. I run two or more programs simultaneously, and can switch among several windows as required.	<input type="checkbox"/> I make preference settings to customize software applications. I configure specialized peripherals such as a digital camera. I feel confident enough to teach students computer operations.
II. File management	<input type="checkbox"/> I do not yet save any files I create using the computer.	<input type="checkbox"/> I understand how to save files I've created but I do not know how to choose where they are saved. I do not know how to copy files between disks.	<input type="checkbox"/> I have a filing system for organizing my computer files, and can locate files quickly and reliably. I back-up my files on a regular basis.	<input type="checkbox"/> I have a system for archiving files that I do not need on a regular basis. I can burn files onto a CD-ROM. I have taught my students how to manage their files on my classroom computers and on the school network.
III. Networking	<input type="checkbox"/> I do not yet have any knowledge of computer network operation.	<input type="checkbox"/> I understand how to use a computer network to store files and to access a printer.	<input type="checkbox"/> I am able to troubleshoot and correct problems such as a shared printer dropping off a peer-to-peer network. I can add or remove computers and shared devices on a peer-to-peer network.	<input type="checkbox"/> I am able to set up a peer-to-peer network in my classroom, complete with a shared printer. I am able to administer the network including passwords and permissions for students on the network.

Level	Beginning	Developing	Accomplished	Exemplary
ICT Skill				
IV. Word processing	<input type="checkbox"/> I do not yet use a word processor.	<input type="checkbox"/> I understand how to use a word processor to create simple documents that I know I will modify and use again, however I generally find it easier to hand write most of my written work.	<input type="checkbox"/> I use a word processor for nearly all my written professional work: memos, tests, worksheets, and home communication. I can edit, spell check, and change the format of a document.	<input type="checkbox"/> I use advanced features of word processing such as track changes and hyperlinks. I use a word processor not only for my own work, but have taught students to use it for all stages of the writing process.
V. Spreadsheet	<input type="checkbox"/> I do not yet use a spreadsheet.	<input type="checkbox"/> I understand how to use a spreadsheet and can navigate within one. I can create a simple spreadsheet that adds a column of numbers.	<input type="checkbox"/> I use spreadsheets for several purposes such as keeping track of student grades. These spreadsheets have labels, formulas, and cell references. I can change the format of my spreadsheets by changing column width and text style. I use my spreadsheets to make graphs and charts.	<input type="checkbox"/> I create spreadsheets with multiple worksheets and link them together. I create macros to use in my spreadsheets. I use the database functions of my spreadsheet. I use a spreadsheet not only for my work, but have taught students to use spreadsheets to help them improve their own data-keeping and analysis skills.
VI. Database	<input type="checkbox"/> I do not yet use a database.	<input type="checkbox"/> I understand how to use a database and can locate information within one that has been pre-made. I can add or delete data in a database. I can sort and print the information in layouts that are useful to me.	<input type="checkbox"/> I use databases for several purposes. I can create a database from scratch - defining fields and creating layouts in order to support inquiry. I can use database information to perform queries.	<input type="checkbox"/> I use formulas with my databases to create summations of numerical data. I use databases not only for my work, but have taught students to use databases to help them improve their own data-keeping and analysis skills.
VII. Concept Mapping	<input type="checkbox"/> I do not yet use concept mapping software.	<input type="checkbox"/> I understand how to use concept mapping software for creating simple concept maps and outlines.	<input type="checkbox"/> I use concept mapping software as a note-taking and organizational tool. I customize the symbols, links, and layout of my concept maps. I create concept maps for my students to use.	<input type="checkbox"/> I use concept mapping software as a presentation tool, complete with Internet links. I also export my concept maps into multimedia presentations or web pages. I have taught my students how to use concept mapping software.

Level	Beginning	Developing	Accomplished	Exemplary
ICT Skill				
VIII. Graphics and Animation	<input type="checkbox"/> I do not yet use graphics in my electronic work.	<input type="checkbox"/> I understand how to use paint and draw software to create simple graphics. I insert both pre-made clipart and simple original graphics into my electronic work.	<input type="checkbox"/> I edit graphics using most of the drawing tools, and can group and ungroup objects. I copy and paste graphics from one application for use in another. I create simple animations.	<input type="checkbox"/> I create digital animations to help my students visualize changes in a process over time. I use graphics and animation not only for my own demonstrations, but have taught students to use graphics to improve their own communications.
IX. CD-ROM inquiry	<input type="checkbox"/> I do not yet seek information from pre-made electronic sources (e.g. CD-ROM encyclopedias).	<input type="checkbox"/> I understand how to use electronic library catalogues to find resources and can conduct simple searches with electronic databases and encyclopedias.	<input type="checkbox"/> I use a variety of search strategies with a number of electronic information sources. I use advanced search functions such as "and" and "or" to help target the search and find just the right information in the most efficient manner.	<input type="checkbox"/> I incorporate logical search strategies into my work with students, showing them the power of such searches with electronic sources. I insist my students respect copyright and cite their sources.
X. Internet inquiry	<input type="checkbox"/> I do not yet use the Internet.	<input type="checkbox"/> I understand how to use a web browser to access and navigate the Internet to find a specific URL. I bookmark my favourite websites.	<input type="checkbox"/> I make efficient use of a variety of search engines, as well as lists of Internet resources, to explore educational applications of the Internet. I evaluate the source of information and its URL to assess its authority, accuracy, objectivity, currency, and coverage.	<input type="checkbox"/> I make effective use of a variety of search engines to create my own hot-lists of Internet resources for student use. I show my students how to access Internet resources and how to evaluate the source of information and its URL to assess its validity. I insist my students respect copyright and cite their sources.

Level	Beginning	Developing	Accomplished	Exemplary
ICT Skill				
XI. Web page Creation	<input type="checkbox"/> I do not yet create web pages.	<input type="checkbox"/> I understand how to create simple single web pages with graphics, Internet links, and mail-to links.	<input type="checkbox"/> I have created a multi-page classroom website with a simple navigation scheme. I use my classroom website to communicate with students and/or parents.	<input type="checkbox"/> I have created a multi-page classroom website that links to student work. I have taught my students how to make their own simple websites and electronic collections of their work on our Intranet or the Internet.
XII. Email	<input type="checkbox"/> I do not yet use electronic mail.	<input type="checkbox"/> I understand how to communicate with a wide variety of people using electronic mail. I send occasional messages and requests for information using email.	<input type="checkbox"/> I check my email account on a regular basis. I use email to access professional information from listservs.	<input type="checkbox"/> I involve my students in using email to communicate globally with other students and various kinds of experts. I use email to communicate reflectively with individual students and to distribute/collect assignments.
XIII. Multimedia Presentations	<input type="checkbox"/> I do not yet create my own multimedia presentations.	<input type="checkbox"/> I understand how to create simple linear multimedia presentations integrating text and graphics.	<input type="checkbox"/> I create non-linear multimedia presentations that include features such as action buttons, animations, Internet links, audio, and video.	<input type="checkbox"/> I create multimedia presentations, not only for my own classroom presentations, but have taught my students to create their own multimedia presentations.
XIV. Digital Imaging	<input type="checkbox"/> I do not yet use a digital camera.	<input type="checkbox"/> I understand how to take photos with a digital camera. I can connect a digital camera to a computer to transfer my own digital images.	<input type="checkbox"/> I can alter digital images by cropping, rotating, and resizing. I import my own original digital images into word processed documents, concept maps, multimedia presentations, and/or webpages.	<input type="checkbox"/> I integrate my own digital images into my classroom presentations and/or on my classroom website. I have taught my students how to take digital images and use them in their own word processed documents, concept maps, multimedia presentations and/or webpages.

Level	Beginning	Developing	Accomplished	Exemplary
ICT Skill				
XV. Videography/ video editing	<input type="checkbox"/> I do not yet use a video camera.	<input type="checkbox"/> I understand how to take video with a video camera. I can connect a video camera to a VCR and/or television in such a way that I can transfer video and monitor the image at the same time.	<input type="checkbox"/> I use video-editing software to clip and sequence video. I prepare digital video clips for use in other applications.	<input type="checkbox"/> I create digital video clips, not only for classroom presentations, but have taught my students to film and edit their own digital video presentations.
XVI. Geographical Information Systems (GIS)	<input type="checkbox"/> I do not yet use GIS software.	<input type="checkbox"/> I understand how to use GIS software to interpret basic data already included with the software.	<input type="checkbox"/> I interpret and analyze data included with the GIS software, as well as data from external sources such as e-stat.	<input type="checkbox"/> I use GIS software to interpret and analyze customized data, including imported data from GPS devices. I have taught my students how to use GIS software and GPS devices.
XVII. Electronic Data Collection	<input type="checkbox"/> I do not yet use electronic data collection devices such as probeware or GPS .	<input type="checkbox"/> I understand how to use at least one type of electronic data collection device to gather experimental data.	<input type="checkbox"/> I use several different electronic data collection devices. I connect these devices to my computer to gather and analyze experimental data.	<input type="checkbox"/> I design experiments that use electronic data collection devices to gather and analyze data. I have taught my students how to use these devices in classroom and field conditions.

Appendix C: OLE & ICT Feedback

There are ten Ongoing Learning Experiences (OLEs) and twelve Information and Communication Technology (ICTs) learning experiences.

- OLE.1 *Binder Reminder*
- OLE.2 *Daily Edit*
- OLE.3 *Daily Math and Problem Solving*
- OLE.4 *Reading Circle*
- OLE.5 *Share the Learning*
- OLE.6 *Collaborative Learning*
- OLE.7 *Speak Yea! Hear Yea!*
- OLE.8 *Reflection Journal*
- OLE.9 *Newspaper*
- OLE.10 *Electronic Collection*

- ICT.1 *Toolbox Binder*
- ICT.2 *Write This Down*
- ICT.3 *Riddle Me This*
- ICT.4 *Looks Like This*
- ICT.5 *Roam Your ROM*
- ICT.6 *Inspired*
- ICT.7 *Caught in Action*
- ICT.8 *Make Your Point*
- ICT.9 *Looking for It*
- ICT.10 *Finding It*
- ICT.11 *Making It*
- ICT.12 *Chart Me This*

There were a total of fourteen multiple choice questions for the OLEs and ICTs.

Question 15 provided a free-write for the pilot teachers' feedback. The following fourteen questions of the online feedback form for the OLEs and ICTs are identical with the exception of question three.

- Question 1: Did you use this OLE/ICT with your students?
- Question 2: Will you continue to use this OLE/ICT throughout the year?
- Question 3 for OLEs: How often would you use this OLE?

- Question 3 for ICTs: Did you have enough technology available to conduct this ICT learning experience in your classroom?
- Question 4: Do you plan to use this OLE/ICT with your students next year?
- Question 5: How well do you feel this OLE/ICT allowed your students to achieve the listed curricular learning outcomes/curricular topics?
- Question 6: In what way did the use of ICT help your students during this OLE/ICT?
- Question 7: How well did the learning resources help in conducting this OLE/ICT?
- Question 8: How well did the activating, acquiring and applying strategies work in this OLE/ICT experience?
- Question 9: How did the assessment strategies work in this OLE/ICT?
- Question 10: How well did this OLE/ICTs' learning centre work to support your students' independence and collaborative learning?
- Question 11: Did you use any of the BLMs or TBLMs supplied with this OLE/ICT?
- Question 12: Did you modify any of the BLMs for your students' use?
- Question 13: How did your students use the BLMs?
- Question 14: Would you recommend this OLE/ICT to a colleague?

The results are displayed as rounded percentages.

Question #1	Yes (%)	No (%)
Did you use this OLE/ICT with your students?		
OLE.1: <i>Binder Reminder</i> (n=8)	75	25
OLE.2: <i>Daily Edit</i> (n=9)	78	22
OLE.3: <i>Daily Math and Problem Solving</i> (n=8)	75	25
OLE.4: <i>Reading Circle</i> (n=9)	89	11
OLE.5: <i>Share the Learning</i> (n=7)	100	0
OLE.6: <i>Collaboration Learning</i> (n=8)	100	0
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=7)	29	71
OLE.8: <i>Reflection Journal</i> (n=8)	75	25
OLE. 9: <i>Newspaper</i> (n=8)	63	37
OLE.10: <i>Electronic Collection</i> (n=8)	87	13
ICT.1: <i>Toolbox Reminder</i> (n=5)	40	60
ICT.2: <i>Write That Down! (Word Processing)</i> (n=7)	86	14
ICT.3: <i>Riddle Me This! (Email)</i> (n=7)	29	71
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=7)	100	0
ICT.5: <i>Roam Your Rom (CDs)</i> (n=7)	57	43
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	100	0
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=8)	87	13
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	100	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=6)	83	17
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=6)	17	83
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=6)	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	67	33

Question #2	Yes (%)	No (%)
<i>Will you continue to use this OLE/ICT throughout the school year?</i>		
OLE.1: <i>Binder Reminder (n=8)</i>	75	25
OLE.2: <i>Daily Edit (n=9)</i>	78	22
OLE.3: <i>Daily Math and Problem Solving (n=7)</i>	86	14
OLE.4: <i>Reading Circle (n=9)</i>	89	11
OLE.5: <i>Share the Learning (n=7)</i>	100	0
OLE.6: <i>Collaboration Learning (n=8)</i>	88	12
OLE.7: <i>Speak Yea! Hear Yea! (n=6)</i>	83	17
OLE.8: <i>Reflection Journal (n=8)</i>	75	25
OLE. 9: <i>Newspaper (n=8)</i>	75	25
OLE.10: <i>Electronic Collection (n=8)</i>	88	12
ICT.1: <i>Toolbox Reminder (n=5)</i>	40	60
ICT.2: <i>Write That Down! (Word Processing) (n=7)</i>	43	57
ICT.3: <i>Riddle Me This! (Email) (n=7)</i>	0	100
ICT.4: <i>Looks Like This! (Paint/Draw) (n=7)</i>	57	43
ICT.5: <i>Roam Your Rom (CDs) (n=6)</i>	17	83
ICT.6: <i>Inspired (Concept Mapping) (n=9)</i>	11	89
ICT.7: <i>Caught in Action (Digital Camera/Video) (n=8)</i>	0	100
ICT.8: <i>Make Your Point (Multimedia) (n=7)</i>	14	86
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1) (n=6)</i>	50	50
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2) (n=5)</i>	0	100
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3) (n=6)</i>	0	100
ICT.12: <i>Chart Me This! (Spreadsheet) (n=6)</i>	0	100

<i>OLE-Question #3 How often would you use this OLE?</i>	Not at All (%)	Once Per Year (%)	Once Per Semester (%)	Once Per Month (%)	Once Per Week (%)	Daily (%)
<i>OLE.1: Binder Reminder (n=8)</i>	25	0	0	0	63	12
<i>OLE.2: Daily Edit (n=9)</i>	0	0	0	0	44	56
<i>OLE.3: Daily Math and Problem Solving (n=8)</i>	12	0	0	0	38	50
<i>OLE.4: Reading Circle (n=9)</i>	0	11	34	11	22	22
<i>OLE.5: Share the Learning (n=7)</i>	0	0	14	14	58	14
<i>OLE.6: Collaboration Learning (n=8)</i>	0	0	12	13	50	25
<i>OLE.7: Speak Yea! Hear Yea! (n=6)</i>	33	0	33	17	17	0
<i>OLE.8: Reflection Journal (n=8)</i>	13	0	13	38	25	13
<i>OLE. 9: Newspaper (n=8)</i>	25	25	0	25	25	0
<i>OLE.10: Electronic Collection (n=8)</i>	13	0	0	13	25	50

ICT-Question #3: <i>Did you have the technology available to conduct this ICT learning outcome in your classroom?</i>	Yes (%)	No (%)
ICT.1: <i>Toolbox Reminder</i> (n=5)	100	0
ICT.2: <i>Write That Down! (Word Processing)</i> (n=7)	100	0
ICT.3: <i>Riddle Me This! (Email)</i> (n=7)	71	29
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=7)	86	14
ICT.5: <i>Roam Your Rom (CDs)</i> (n=6)	67	33
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	89	11
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=8)	100	0
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	100	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=6)	83	17
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=6)	83	17
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=6)	83	17
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	100	0

Question #4 <i>Do you plan to use this OLE/ICT with your students next year?</i>	Yes (%)	No (%)
OLE.1: <i>Binder Reminder</i> (n=8)	100	0
OLE.2: <i>Daily Edit</i> (n=9)	100	0
OLE.3: <i>Daily Math and Problem Solving</i> (n=8)	87	13
OLE.4: <i>Reading Circle</i> (n=9)	100	0
OLE.5: <i>Share the Learning</i> (n=7)	100	0
OLE.6: <i>Collaboration Learning</i> (n=8)	100	0
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=7)	100	0
OLE.8: <i>Reflection Journal</i> (n=8)	75	25
OLE.9: <i>Newspaper</i> (n=8)	88	12
OLE.10: <i>Electronic Collection</i> (n=8)	100	0
ICT.1: <i>Toolbox Reminder</i> (n=5)	80	20
ICT.2: <i>Write That Down! (Word Processing)</i> (n=7)	100	0
ICT.3: <i>Riddle Me This! (Email)</i> (n=7)	86	14
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=7)	100	0
ICT.5: <i>Roam Your Rom (CDs)</i> (n=6)	100	0
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	100	0
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=8)	100	0
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	100	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=6)	100	0
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=6)	67	33
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=6)	83	17
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	100	0

Question #5 How well do you feel this OLE/ICT allowed your students to achieve the listed curricular learning outcomes/curricular topics?	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this OLE (%)
OLE.1: <i>Binder Reminder</i> (n=8)	0	13	50	13	25
OLE.2: <i>Daily Edit</i> (n=9)	0	0	33	56	11
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	0	29	29	29	14
OLE.4: <i>Reading Circle</i> (n=9)	0	22	44	22	11
OLE.5: <i>Share the Learning</i> (n=7)	0	14	29	57	0
OLE.6: <i>Collaboration Learning</i> (n=8)	0	13	50	37	0
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=6)	0	17	17	0	67
OLE.8: <i>Reflection Journal</i> (n=8)	0	25	38	13	25
OLE. 9: <i>Newspaper</i> (n=8)	0	13	50	13	25
OLE.10: <i>Electronic Collection</i> (n=8)	0	0	25	63	13
ICT.1: <i>Toolbox Reminder</i> (n=5)	0	0	40	20	40
ICT.2: <i>Write That Down! (Word</i> <i>Processing)</i> (n=6)	0	17	17	67	0
ICT.3: <i>Riddle Me This! (Email)</i> (n=6)	0	0	17	33	50
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=6)	0	17	50	33	0
ICT.5: <i>Roam Your Rom (CDs)</i> (n=6)	0	33	33	17	17
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	0	22	11	67	0
ICT.7: <i>Caught in Action (Digital</i> <i>Camera/Video)</i> (n=8)	0	22	11	44	0
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	0	0	14	86	0
ICT.9: <i>Looking for It: Learning to Search</i> <i>the Internet (Internet #1)</i> (n=5)	0	20	20	60	0
ICT.10: <i>Finding It: Internet Scavenger</i> <i>Hunt (Internet #2)</i> (n=5)	0	0	0	20	80
ICT.11: <i>Making It: Creating a Good Web</i> <i>Page (Internet #3)</i> (n=6)	0	0	0	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	0	17	17	33	33

OLE-Question #6 <i>In what way did the use of ICT help your students during this OLE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this OLE (%)
OLE.1: <i>Binder Reminder (n=8)</i>	13	13	13	38	25
OLE.2: <i>Daily Edit (n=9)</i>	11	44	22	0	22
OLE.3: <i>Daily Math and Problem Solving (n=7)</i>	29	29	29	0	14
OLE.4: <i>Reading Circle (n=9)</i>	22	22	11	22	22
OLE.5: <i>Share the Learning (n=7)</i>	0	29	29	43	0
OLE.6: <i>Collaboration Learning (n=8)</i>	0	25	63	13	0
OLE.7: <i>Speak Yea! Hear Yea! (n=6)</i>	0	17	17	0	67
OLE.8: <i>Reflection Journal (n=8)</i>	25	13	25	13	25
OLE. 9: <i>Newspaper (n=8)</i>	0	25	25	13	38
OLE.10: <i>Electronic Collection (n=8)</i>	0	0	13	75	13
ICT.1: <i>Toolbox Reminder (n=5)</i>	0	0	20	40	40
ICT.2: <i>Write That Down! (Word Processing) (n=6)</i>	0	17	17	67	0
ICT.3: <i>Riddle Me This! (Email) (n=6)</i>	0	0	0	33	67
ICT.4: <i>Looks Like This! (Paint/Draw) (n=7)</i>	0	14	57	29	0
ICT.5: <i>Roam Your Rom (CDs) (n=6)</i>	0	33	33	17	17
ICT.6: <i>Inspired (Concept Mapping) (n=9)</i>	0	11	22	67	0
ICT.7: <i>Caught in Action (Digital Camera/Video) (n=7)</i>	0	0	43	57	0
ICT.8: <i>Make Your Point (Multimedia) (n=7)</i>	0	14	0	86	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1) (n=6)</i>	0	0	0	67	33
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2) (n=5)</i>	0	0	0	20	80
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3) (n=5)</i>	0	0	0	0	100
ICT.12: <i>Chart Me This! (Spreadsheet) (n=6)</i>	0	0	0	67	33

Question #7 How well did the learning resources help in conducting this OLE/ICT?	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this OLE (%)
OLE.1: <i>Binder Reminder</i> (n=8)	0	38	38	0	25
OLE.2: <i>Daily Edit</i> (n=9)	22	44	0	22	11
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	29	29	29	0	14
OLE.4: <i>Reading Circle</i> (n=9)	0	44	33	22	0
OLE.5: <i>Share the Learning</i> (n=7)	0	14	29	57	0
OLE.6: <i>Collaboration Learning</i> (n=8)	0	13	75	13	0
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=6)	0	17	17	0	67
OLE.8: <i>Reflection Journal</i> (n=8)	25	25	25	0	25
OLE. 9: <i>Newspaper</i> (n=8)	0	25	25	13	38
OLE.10: <i>Electronic Collection</i> (n=8)	0	25	38	25	13
ICT.1: <i>Toolbox Reminder</i> (n=4)	0	25	0	25	50
ICT.2: <i>Write That Down! (Word Processing)</i> (n=6)	17	33	50	0	0
ICT.3: <i>Riddle Me This! (Email)</i> (n=6)	0	0	0	33	67
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=7)	14	29	29	29	0
ICT.5: <i>Roam Your Rom (CDs)</i> (n=5)	0	20	40	20	20
ICT.6: <i>Inspired (Concept Mapping)</i> (n=8)	0	13	13	75	0
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=6)	0	17	67	17	0
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	0	57	29	14	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=5)	0	40	20	40	0
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=5)	0	0	0	20	80
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=5)	0	0	0	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	0	33	33	0	33

Question #8 How did the activating, acquiring, and applying strategies work in this OLE/ICT experience?	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this OLE (%)
OLE.1: Binder Reminder (n=8)	0	13	50	13	25
OLE.2: Daily Edit (n=9)	0	22	22	33	22
OLE.3: Daily Math and Problem Solving (n=7)	14	29	29	0	14
OLE.4: Reading Circle (n=9)	0	56	22	22	0
OLE.5: Share the Learning (n=7)	0	29	14	57	0
OLE.6: Collaboration Learning (n=8)	0	50	38	13	0
OLE.7: Speak Yea! Hear Yea! (n=6)	0	0	33	0	67
OLE.8: Reflection Journal (n=8)	0	38	25	13	25
OLE. 9: Newspaper (n=8)	0	25	25	13	38
OLE.10: Electronic Collection (n=8)	0	25	25	38	13
ICT.1: Toolbox Reminder (n=4)	0	0	25	25	50
ICT.2: Write That Down! (Word Processing) (n=6)	0	50	33	17	0
ICT.3: Riddle Me This! (Email) (n=6)	0	17	17	0	67
ICT.4: Looks Like This! (Paint/Draw) (n=6)	0	33	67	0	0
ICT.5: Roam Your Rom (CDs) (n=5)	0	40	40	0	20
ICT.6: Inspired (Concept Mapping) (n=8)	0	0	50	50	0
ICT.7: Caught in Action (Digital Camera/Video) (n=6)	17	17	50	17	0
ICT.8: Make Your Point (Multimedia) (n=7)	0	57	27	14	0
ICT.9: Looking for It: Learning to Search the Internet (Internet #1) (n=5)	0	40	40	20	0
ICT.10: Finding It: Internet Scavenger Hunt (Internet #2) (n=5)	0	0	20	0	80
ICT.11: Making It: Creating a Good Web Page (Internet #3) (n=5)	0	0	0	0	100
ICT.12: Chart Me This! (Spreadsheet) (n=6)	0	17	33	17	33

Question #9 How did the assessment strategies work in this OLE/ICT?	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this OLE (%)
OLE.1: <i>Binder Reminder</i> (n=8)	13	13	25	13	38
OLE.2: <i>Daily Edit</i> (n=9)	0	22	33	22	22
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	29	29	29	0	14
OLE.4: <i>Reading Circle</i> (n=9)	11	33	11	33	11
OLE.5: <i>Share the Learning</i> (n=7)	14	0	43	29	0
OLE.6: <i>Collaboration Learning</i> (n=7)	0	29	57	14	0
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=6)	0	17	17	0	67
OLE.8: <i>Reflection Journal</i> (n=8)	13	50	0	13	25
OLE. 9: <i>Newspaper</i> (n=8)	0	38	13	13	38
OLE.10: <i>Electronic Collection</i> (n=8)	0	25	25	25	25
ICT.1: <i>Toolbox Reminder</i> (n=4)	0	0	25	25	50
ICT.2: <i>Write That Down! (Word Processing)</i> (n=6)	33	17	33	17	0
ICT.3: <i>Riddle Me This! (Email)</i> (n=6)	0	17	17	0	67
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=6)	0	17	50	33	0
ICT.5: <i>Roam Your Rom (CDs)</i> (n=5)	20	40	20	0	20
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	11	22	33	33	0
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=6)	17	50	17	17	0
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	0	57	14	29	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=5)	20	20	60	0	0
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=5)	0	0	20	0	80
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=5)	0	0	0	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	0	33	17	17	33

Question #10 How well did this OLE/ICTs learning centre work to support your students' independence and collaboration learning?	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this OLE (%)
OLE.1: Binder Reminder (n=8)	0	25	13	38	25
OLE.2: Daily Edit (n=9)	0	11	33	44	11
OLE.3: Daily Math and Problem Solving (n=7)	29	0	43	14	14
OLE.4: Reading Circle (n=9)	11	44	11	33	0
OLE.5: Share the Learning (n=6)	0	0	50	50	0
OLE.6: Collaboration Learning (n=8)	0	25	38	25	13
OLE.7: Speak Yea! Hear Yea! (n=6)	0	17	17	0	67
OLE.8: Reflection Journal (n=8)	0	50	0	25	25
OLE.9: Newspaper (n=8)	0	25	25	13	38
OLE.10: Electronic Collection (n=8)	0	13	25	50	13
ICT.1: Toolbox Reminder (n=3)	0	0	67	0	33
ICT.2: Write That Down! (Word Processing) (n=6)	0	33	50	17	0
ICT.3: Riddle Me This! (Email) (n=6)	17	0	0	17	67
ICT.4: Looks Like This! (Paint/Draw) (n=7)	14	14	29	43	0
ICT.5: Roam Your Rom (CDs) (n=6)	0	50	17	17	17
ICT.6: Inspired (Concept Mapping) (n=9)	0	22	22	56	0
ICT.7: Caught in Action (Digital Camera/Video) (n=7)	0	43	14	43	0
ICT.8: Make Your Point (Multimedia) (n=7)	14	0	29	57	0
ICT.9: Looking for It: Learning to Search the Internet (Internet #1) (n=4)	0	0	75	25	0
ICT.10: Finding It: Internet Scavenger Hunt (Internet #2) (n=5)	0	0	0	20	80
ICT.11: Making It: Creating a Good Web Page (Internet #3) (n=5)	0	0	0	0	100
ICT.12: Chart Me This! (Spreadsheet) (n=6)	0	17	33	17	33

Question #11 Did you use any of the BLMs or TBLMs supplied with this OLE/ICT?	Yes (%)	No (%)
OLE.1: <i>Binder Reminder</i> (n=8)	38	63
OLE.2: <i>Daily Edit</i> (n=9)	33	67
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	14	86
OLE.4: <i>Reading Circle</i> (n=9)	56	44
OLE.5: <i>Share the Learning</i> (n=7)	57	43
OLE.6: <i>Collaboration Learning</i> (n=8)	50	50
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=6)	17	83
OLE.8: <i>Reflection Journal</i> (n=8)	38	63
OLE.9: <i>Newspaper</i> (n=8)	13	88
OLE.10: <i>Electronic Collection</i> (n=8)	25	75
ICT.1: <i>Toolbox Reminder</i> (n=5)	40	60
ICT.2: <i>Write That Down! (Word Processing)</i> (n=6)	33	67
ICT.3: <i>Riddle Me This! (Email)</i> (n=5)	20	80
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=5)	33	67
ICT.5: <i>Roam Your Rom (CDs)</i> (n=6)	17	83
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	33	78
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=7)	14	86
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	43	57
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=5)	60	40
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=4)	25	75
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=5)	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	17	83

Question #12 Did you modify any of the BLMs for your students' use?	Yes (%)	No (%)
OLE.1: <i>Binder Reminder</i> (n=8)	50	50
OLE.2: <i>Daily Edit</i> (n=9)	22	78
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	14	86
OLE.4: <i>Reading Circle</i> (n=9)	44	56
OLE.5: <i>Share the Learning</i> (n=7)	57	43
OLE.6: <i>Collaboration Learning</i> (n=8)	38	63
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=6)	0	100
OLE.8: <i>Reflection Journal</i> (n=8)	25	75
OLE.9: <i>Newspaper</i> (n=8)	13	88
OLE.10: <i>Electronic Collection</i> (n=8)	25	75
ICT.1: <i>Toolbox Reminder</i> (n=5)	20	80
ICT.2: <i>Write That Down! (Word Processing)</i> (n=6)	33	67
ICT.3: <i>Riddle Me This! (Email)</i> (n=6)	17	83
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=6)	14	86
ICT.5: <i>Roam Your Rom (CDs)</i> (n=6)	33	67
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	22	78
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=7)	14	86
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	43	57
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=5)	40	60
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=5)	20	80
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=5)	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	17	83

Question #13 How did your students use the BLMs?	On Paper (%)	On Computer (%)	Did Not Use Any BLMs (%)
OLE.1: <i>Binder Reminder</i> (n=8)	38	0	63
OLE.2: <i>Daily Edit</i> (n=9)	22	0	78
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	43	0	57
OLE.4: <i>Reading Circle</i> (n=9)	56	11	33
OLE.5: <i>Share the Learning</i> (n=7)	86	0	14
OLE.6: <i>Collaboration Learning</i> (n=8)	50	13	38
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=6)	17	0	83
OLE.8: <i>Reflection Journal</i> (n=8)	50	0	50
OLE. 9: <i>Newspaper</i> (n=8)	13	0	88
OLE.10: <i>Electronic Collection</i> (n=8)	25	0	75
ICT.1: <i>Toolbox Reminder</i> (n=5)	60	0	40
ICT.2: <i>Write That Down! (Word Processing)</i> (n=5)	20	40	40
ICT.3: <i>Riddle Me This! (Email)</i> (n=6)	17	17	67
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=6)	17	17	67
ICT.5: <i>Roam Your Rom (CDs)</i> (n=5)	40	0	60
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	22	11	67
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=7)	0	14	86
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	57	0	43
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=5)	40	20	40
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=5)	0	20	80
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=5)	0	0	100
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	17	0	83

Question #14 Would your recommend this OLE/ICT to a colleague?	Yes (%)	No (%)
OLE.1: <i>Binder Reminder</i> (n=8)	100	0
OLE.2: <i>Daily Edit</i> (n=9)	89	11
OLE.3: <i>Daily Math and Problem Solving</i> (n=7)	86	14
OLE.4: <i>Reading Circle</i> (n=9)	100	0
OLE.5: <i>Share the Learning</i> (n=7)	100	0
OLE.6: <i>Collaboration Learning</i> (n=8)	100	0
OLE.7: <i>Speak Yea! Hear Yea!</i> (n=7)	100	0
OLE.8: <i>Reflection Journal</i> (n=8)	75	25
OLE.9: <i>Newspaper</i> (n=8)	75	25
OLE.10: <i>Electronic Collection</i> (n=8)	100	0
ICT.1: <i>Toolbox Binder</i> (n=5)	60	40
ICT.2: <i>Write That Down! (Word Processing)</i> (n=7)	100	0
ICT.3: <i>Riddle Me This! (Email)</i> (n=7)	100	0
ICT.4: <i>Looks Like This! (Paint/Draw)</i> (n=7)	71	29
ICT.5: <i>Roam Your Rom (CDs)</i> (n=5)	100	0
ICT.6: <i>Inspired (Concept Mapping)</i> (n=9)	100	0
ICT.7: <i>Caught in Action (Digital Camera/Video)</i> (n=7)	100	0
ICT.8: <i>Make Your Point (Multimedia)</i> (n=7)	100	0
ICT.9: <i>Looking for It: Learning to Search the Internet (Internet #1)</i> (n=6)	100	0
ICT.10: <i>Finding It: Internet Scavenger Hunt (Internet #2)</i> (n=6)	67	33
ICT.11: <i>Making It: Creating a Good Web Page (Internet #3)</i> (n=6)	67	33
ICT.12: <i>Chart Me This! (Spreadsheet)</i> (n=6)	100	0

Appendix D: Module 1 Feedback

There were eight learning experiences in Module 1.

- M1.1 *The Big Picture*
- M1.2 *Everybody Talks About the Weather*
- M1.3 *Properties of Air*
- M1.4 *Recording Weather*
- M1.5 *Cloud Formations*
- M1.6 *Let's Look At Climate Change*
- M1.7 *Creation of the Climate Change Kid's Club*
- M1.8 *Data Analysis and Display*

There were eleven questions in Module 1's online feedback form. Question 12 allowed pilot teachers an opportunity to share their comments.

- Question 1: Did you use this Module Learning Experience (LE) with your students?
- Question 2: Do you plan to use this Module LE with your students next year?
- Question 3: How well did this Module LE connect to the *Climate Change Awareness Week* culminating task?
- Question 4: How well did the learning resources help in conducting this Module LE?
- Question 5: How did activating, acquiring, and applying strategies work in this Module?
- Question 6: How did the assessment strategies work in this Module LE?
- Question 7: How well did this Module's LE learning centre work to support your students' independence and collaborative learning?
- Question 8: Did you use any of the BLMs or TBLMs with this Module LE?
- Question 9: Did you modify any of the BLMs for your student use?
- Question 10: How did your students use the BLMs?
- Question 11: Would you recommend this Module LE to a colleague?

The results are displayed as rounded percentages.

Question #1 <i>Did you use this Module Learning Experience (LE) with your students?</i>	Yes (%)	No (%)
M1.1: The Big Picture (n=9)	89	11
M1.2: Everybody Talks About the Weather (n=10)	100	0
M1.3: Properties of Air (n=10)	90	10
M1.4: Recording Weather (n=9)	89	11
M1.5: Cloud Formations (n=9)	100	0
M1.6: Let's Look at Climate Change (n=9)	100	0
M1.7: Creation of the Climate Change Kids' Club (n=8)	100	0
M1.8: Data Analysis and Display (n=8)	25	75

Question #2 <i>Did you plan to use this Module LE with your students next year?</i>	Yes (%)	No (%)
M1.1: The Big Picture (n=9)	78	22
M1.2: Everybody Talks About Weather (n=10)	70	30
M1.3: Properties of Air (n=10)	90	10
M1.4: Recording Weather (n=9)	89	11
M1.5: Cloud Formations (n=9)	100	0
M1.6: Let's Look at Climate Change (n=9)	78	22
M1.7: Creation of the Climate Change Kids' Club (n=8)	100	0
M1.8: Data Analysis and Display (n=8)	75	25

Question #3 <i>How well did this Module LE connect to the Climate Change Awareness Week culminating task?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M1.1: The Big Picture (n=8)	0	38	25	25	13
M1.2: Everybody Talks About Weather (n=10)	10	40	40	10	0
M1.3: Properties of Air (n=10)	0	30	40	20	10
M1.4: Recording Weather (n=9)	11	22	33	33	0
M1.5: Cloud Formations (n=9)	11	44	33	11	0
M1.6: Let's Look at Climate Change (n=9)	22	0	33	44	0
M1.7: Creation of the Climate Change Kids' Club (n=8)	0	0	0	75	25
M1.8: Data Analysis and Display (n=8)	0	0	13	13	75

Question #4 <i>How well did the learning resources help in conducting this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M1.1: The Big Picture (n=8)	13	25	38	25	13
M1.2: Everybody Talks About Weather (n=10)	0	40	30	30	0
M1.3: Properties of Air (n=10)	0	0	60	40	0
M1.4: Recording Weather (n=9)	0	11	78	11	0
M1.5: Cloud Formations (n=9)	0	0	67	33	0
M1.6: Let's Look at Climate Change (n=9)	0	11	56	22	0
M1.7: Creation of the Climate Change Kids' Club (n=8)	0	13	0	63	25
M1.8: Data Analysis and Display (n=8)	0	0	13	13	75

Question #5 <i>How did the activating, acquiring and applying strategies work in this Module?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M1.1: The Big Picture (n=8)	0	13	38	38	13
M1.2: Everybody Talks About Weather (n=10)	10	10	70	10	0
M1.3: Properties of Air (n=10)	0	10	60	20	10
M1.4: Recording Weather (n=9)	0	22	44	33	0
M1.5: Cloud Formations (n=9)	0	11	78	11	0
M1.6: Let's Look at Climate Change (n=9)	0	33	44	22	0
M1.7: Creation of the Climate Change Kids' Club (n=8)	0	0	38	38	25
M1.8: Data Analysis and Display (n=8)	0	13	0	13	75

Question #6 <i>How did the assessment strategies work in this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M1.1: <i>The Big Picture</i> (n=8)	13	38	25	13	13
M1.2: <i>Everybody Talks About Weather</i> (n=10)	10	50	20	20	0
M1.3: <i>Properties of Air</i> (n=10)	10	10	50	30	0
M1.4: <i>Recording Weather</i> (n=9)	0	33	56	11	0
M1.5: <i>Cloud Formations</i> (n=9)	11	56	33	0	0
M1.6: <i>Let's Look at Climate Change</i> (n=8)	13	13	63	13	0
M1.7: <i>Creation of the Climate Change Kids' Club</i> (n=8)	0	13	25	38	25
M1.8: <i>Data Analysis and Display</i> (n=8)	0	13	0	13	75

Question #7 <i>How well did this Module LEs learning centre work to support your student's independence and collaborative learning?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M1.1: <i>The Big Picture</i> (n=8)	13	38	38	0	13
M1.2: <i>Everybody Talks About Weather</i> (n=10)	20	30	40	10	0
M1.3: <i>Properties of Air</i> (n=10)	10	0	10	70	10
M1.4: <i>Recording Weather</i> (n=9)	0	11	33	56	0
M1.5: <i>Cloud Formations</i> (n=9)	0	11	44	44	0
M1.6: <i>Let's Look at Climate Change</i> (n=9)	0	22	44	33	0
M1.7: <i>Creation of the Climate Change Kids' Club</i> (n=8)	0	0	25	50	25
M1.8: <i>Data Analysis and Display</i> (n=8)	0	0	13	13	75

Question #8 <i>Did you use any of the BLMs or TBLMs with this Module LE?</i>	Yes (%)	No (%)
M1.1: The Big Picture (n=8)	75	25
M1.2: Everybody Talks About Weather (n=10)	80	20
M1.3: Properties of Air (n=10)	90	10
M1.4: Recording Weather (n=8)	63	38
M1.5: Cloud Formations (n=9)	78	22
M1.6: Let's Look at Climate Change (n=9)	78	22
M1.7: Creation of the Climate Change Kids' Club (n=8)	50	50
M1.8: Data Analysis and Display (n=8)	13	88

Question #9 <i>Did you modify any of the BLMs for your student use?</i>	Yes (%)	No (%)
M1.1: The Big Picture (n=8)	0	100
M1.2: Everybody Talks About Weather (n=8)	38	63
M1.3: Properties of Air (n=10)	50	50
M1.4: Recording Weather (n=10)	40	60
M1.5: Cloud Formations (n=9)	44	56
M1.6: Let's Look at Climate Change (n=9)	33	67
M1.7: Creation of the Climate Change Kids' Club (n=9)	22	78
M1.8: Data Analysis and Display (n=8)	13	88

Question #10 <i>How did your students use the BLMs?</i>	On Paper	On Computer	Did Not Use Any BLMs (%)
M1.1: The Big Picture (n=8)	13	13	75
M1.2: Everybody Talks About Weather (n=8)	63	13	25
M1.3: Properties of Air (n=10)	80	10	10
M1.4: Recording Weather (n=10)	90	0	10
M1.5: Cloud Formations (n=9)	89	0	11
M1.6: Let's Look at Climate Change (n=9)	78	11	11
M1.7: Creation of the Climate Change Kids' Club (n=8)	38	0	63
M1.8: Data Analysis and Display (n=8)	13	13	75

Question #11 <i>Would you recommend this Module LE to a colleague?</i>	Yes (%)	No (%)
M1.1: <i>The Big Picture</i> (n=8)	75	25
M1.2: <i>Everybody Talks About Weather</i> (n=10)	90	10
M1.3: <i>Properties of Air</i> (n=10)	100	0
M1.4: <i>Recording Weather</i> (n=8)	88	13
M1.5: <i>Cloud Formations</i> (n=9)	89	11
M1.6: <i>Let's Look at Climate Change</i> (n=8)	100	0
M1.7: <i>Creation of the Climate Change Kids' Club</i> (n=8)	100	0
M1.8: <i>Data Analysis and Display</i> (n=8)	63	38

Appendix E: Module 2 Feedback

There were seven learning experiences in Module 2.

- M2.1 *What's Changed?*
- M2.2 *Consequences Of Our Actions*
- M2.3 *What the Data Shows...*
- M2.4 *Sharing the Consequences*
- M2.5 *Spreading the News*
- M2.6 *Weather Phenomena*
- M2.7 *Climate Climaxes*

There were eleven questions in Module 2's online feedback form. Question 12 allowed pilot teachers an opportunity to share their comments.

- Question 1: Did you use this Module Learning Experience (LE) with your students?
- Question 2: Do you plan to use this Module LE with your students next year?
- Question 3: How well did this Module LE connect to the *Climate Change Awareness Week* culminating task?
- Question 4: How well did the learning resources help in conducting this Module LE?
- Question 5: How did activating, acquiring, and applying strategies work in this Module?
- Question 6: How did the assessment strategies work in this Module LE?
- Question 7: How well did this Module's LE learning centre work to support your students' independence and collaborative learning?
- Question 8: Did you use any of the BLMs or TBLMs with this Module LE?
- Question 9: Did you modify any of the BLMs for your student use?
- Question 10: How did your students use the BLMs?
- Question 11: Would you recommend this Module LE to a colleague?

The results are displayed as rounded percentages.

Question #1 <i>Did you use this Module Learning Experience (LE) with your students?</i>	Yes (%)	No (%)
M2.1: What's Changed? (n=8)	75	25
M2.2: Consequences of Our Actions (n=7)	57	43
M2.3: What the Data Shows (n=7)	43	57
M2.4: Sharing the Consequences (n=7)	71	29
M2.5: Spreading the News (n=7)	71	29
M2.6: Weather Phenomena (n=7)	57	43
M2.7: Climate Climaxes (n=7)	71	29

Question #2 <i>Do you plan to use this Module LE with your students next year?</i>	Yes (%)	No (%)
M2.1: What's Changed? (n=8)	75	25
M2.2: Consequences of Our Actions (n=7)	86	14
M2.3: What the Data Shows (n=7)	57	43
M2.4: Sharing the Consequences (n=7)	86	14
M2.5: Spreading the News (n=7)	86	14
M2.6: Weather Phenomena (n=7)	71	29
M2.7: Climate Climaxes (n=7)	86	14

Question #3 <i>How well did this Module LE connect to the Climate Change Awareness Week culminating task?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M2.1: What's Changed? (n=8)	0	13	13	50	25
M2.2: Consequences of Our Actions (n=7)	14	14	14	14	43
M2.3: What the Data Shows (n=7)	0	0	14	29	57
M2.4: Sharing the Consequences (n=7)	0	0	29	43	29
M2.5: Spreading the News (n=7)	0	0	57	14	29
M2.6: Weather Phenomena (n=7)	0	14	29	29	29
M2.7: Climate Climaxes (n=7)	0	14	29	43	14

Question #4 <i>How well did the learning resources help in conducting this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M2.1: What's Changed? (n=8)	13	25	25	13	25
M2.2: Consequences of Our Actions (n=7)	0	14	0	43	43
M2.3: What the Data Shows (n=7)	0	0	14	29	57
M2.4: Sharing the Consequences (n=7)	0	0	57	14	29
M2.5: Spreading the News (n=7)	0	0	57	14	29
M2.6: Weather Phenomena (n=7)	0	14	29	14	43
M2.7: Climate Climaxes (n=7)	0	29	29	29	14

Question #5 <i>How did the activating, acquiring and applying strategies work in this Module?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M2.1: What's Changed? (n=8)	0	13	25	25	38
M2.2: Consequences of Our Actions (n=7)	0	14	29	14	43
M2.3: What the Data Shows (n=7)	0	0	29	14	57
M2.4: Sharing the Consequences (n=7)	0	29	29	14	29
M2.5: Spreading the News (n=7)	0	29	29	14	29
M2.6: Weather Phenomena (n=7)	0	0	43	14	43
M2.7: Climate Climaxes (n=7)	0	0	57	29	14

Question #6 <i>How did the assessment strategies work in this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M2.1: What's Changed? (n=8)	0	13	25	13	50
M2.2: Consequences of Our Actions (n=7)	14	29	0	14	43
M2.3: What the Data Shows (n=7)	14	0	14	14	57
M2.4: Sharing the Consequences (n=7)	14	0	43	14	29
M2.5: Spreading the News (n=7)	0	14	29	29	29
M2.6: Weather Phenomena (n=7)	0	14	29	29	43
M2.7: Climate Climaxes (n=7)	0	29	29	29	14

Question #7 <i>How well did this Module LEs learning centre work to support your student's independence and collaborative learning?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M2.1: What's Changed? (n=8)	0	0	38	25	38
M2.2: Consequences of Our Actions (n=7)	0	14	29	14	43
M2.3: What the Data Shows (n=7)	0	0	29	14	57
M2.4: Sharing the Consequences (n=7)	0	0	29	43	29
M2.5: Spreading the News (n=7)	0	0	57	14	29
M2.6: Weather Phenomena (n=7)	0	0	43	14	43
M2.7: Climate Climaxes (n=7)	0	14	29	43	14

Question #8 <i>Did you use any of the BLMs or TBLMs with this Module LE?</i>	Yes (%)	No (%)
M2.1: What's Changed? (n=8)	25	75
M2.2: Consequences of Our Actions (n=7)	29	71
M2.3: What the Data Shows (n=7)	29	71
M2.4: Sharing the Consequences (n=7)	57	43
M2.5: Spreading the News (n=7)	0	100
M2.6: Weather Phenomena (n=7)	57	43
M2.7: Climate Climaxes (n=7)	57	43

Question #9 <i>Did you modify any of the BLMs for your student use?</i>	Yes (%)	No (%)
M2.1: What's Changed? (n=8)	13	88
M2.2: Consequences of Our Actions (n=7)	14	86
M2.3: What the Data Shows (n=7)	0	100
M2.4: Sharing the Consequences (n=7)	0	100
M2.5: Spreading the News (n=7)	0	100
M2.6: Weather Phenomena (n=7)	43	57
M2.7: Climate Climaxes (n=7)	43	57

Question #10 <i>How did your students use the BLMs?</i>	On Paper	On Computer	Did Not Use Any BLMs (%)
M2.1: <i>What's Changed?</i> (n=8)	25	0	75
M2.2: <i>Consequences of Our Actions</i> (n=7)	29	0	71
M2.3: <i>What the Data Shows</i> (n=7)	14	14	71
M2.4: <i>Sharing the Consequences</i> (n=7)	57	0	43
M2.5: <i>Spreading the News</i> (n=7)	71	0	29
M2.6: <i>Weather Phenomena</i> (n=7)	57	14	29
M2.7: <i>Climate Climaxes</i> (n=7)	29	29	43

Question #11 <i>Would you recommend this Module LE to a colleague?</i>	Yes (%)	No (%)
M2.1: <i>What's Changed?</i> (n=8)	75	25
M2.2: <i>Consequences of Our Actions</i> (n=7)	57	43
M2.3: <i>What the Data Shows</i> (n=7)	71	29
M2.4: <i>Sharing the Consequences</i> (n=7)	100	0
M2.5: <i>Spreading the News</i> (n=7)	100	0
M2.6: <i>Weather Phenomena</i> (n=7)	86	14
M2.7: <i>Climate Climaxes</i> (n=7)	100	0

Appendix F: Module 3 Feedback

There were six learning experiences in Module 3.

- M3.1 *Let's Look At Our Actions*
- M3.2 *How Do You Want Your Future World To Be?*
- M3.3 *The Survey Says...*
- M3.4 *On The Other Hand*
- M3.5 *Caring For The Earth*
- M3.6 *We Can All Make A Difference*

There were eleven questions in the online feedback form for Module 3. Question 12 allowed pilot teachers an opportunity to share their comments.

- Question 1: Did you use this Module Learning Experience (LE) with your students?
- Question 2: Do you plan to use this Module LE with your students next year?
- Question 3: How well did this Module LE connect to the *Climate Change Awareness Week* culminating task?
- Question 4: How well did the learning resources help in conducting this Module LE?
- Question 5: How did activating, acquiring, and applying strategies work in this Module?
- Question 6: How did the assessment strategies work in this Module LE?
- Question 7: How well did this Module's LE learning centre work to support your students' independence and collaborative learning?
- Question 8: Did you use any of the BLMs or TBLMs with this Module LE?
- Question 9: Did you modify any of the BLMs for your student use?
- Question 10: How did your students use the BLMs?
- Question 11: Would you recommend this Module LE to a colleague?

The results are displayed as rounded percentages.

Question #1	Yes (%)	No (%)
<i>Did you use this Module Learning Experience (LE) with your students?</i>		
M3.1: Let's Look At Our Actions (n=7)	43	57
M3.2: How Do You Want Your Future World To Be? (n=7)	29	71
M3.3: The Survey Says... (n=7)	57	43
M3.4: On The Other Hand (n=7)	43	57
M3.5: Caring For The Earth (n=7)	71	29
M3.6: We All Can Make A Difference (n=7)	86	14

Question #2	Yes (%)	No (%)
<i>Do you plan to use this Module LE with your students next year?</i>		
M3.1: Let's Look At Our Actions (n=7)	71	29
M3.2: How Do You Want Your Future World To Be? (n=7)	14	86
M3.3: The Survey Says... (n=7)	71	29
M3.4: On The Other Hand (n=7)	43	57
M3.5: Caring For The Earth (n=7)	71	29
M3.6: We All Can Make A Difference (n=7)	86	14

Question #3	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
<i>How well did this Module LE connect to the Climate Change Awareness Week culminating task?</i>					
M3.1: Let's Look At Our Actions (n=7)	0	14	0	29	57
M3.2: How Do You Want Your Future World To Be? (n=7)	0	0	14	14	71
M3.3: The Survey Says... (n=7)	0	14	29	14	43
M3.4: On The Other Hand (n=7)	0	0	0	0	100
M3.5: Caring For The Earth (n=6)	0	0	0	50	50
M3.6: We All Can Make A Difference (n=7)	0	0	0	71	29

Question #4 <i>How well did the learning resources help in conducting this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M3.1: Let's Look At Our Actions (n=7)	0	0	14	29	57
M3.2: How Do You Want Your Future World To Be? (n=7)	0	0	14	14	71
M3.3: The Survey Says... (n=7)	0	14	29	14	43
M3.4: On The Other Hand (n=6)	0	0	0	0	100
M3.5: Caring For The Earth (n=7)	0	14	29	14	43
M3.6: We All Can Make A Difference (n=7)	0	0	0	71	29

Question #5 <i>How did the activating, acquiring and applying strategies work in this Module?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M3.1: Let's Look At Our Actions (n=7)	0	0	29	14	57
M3.2: How Do You Want Your Future World To Be? (n=7)	0	0	14	14	71
M3.3: The Survey Says... (n=7)	0	14	29	14	43
M3.4: On The Other Hand (n=7)	0	0	0	0	100
M3.5: Caring For The Earth (n=7)	0	14	29	14	43
M3.6: We All Can Make A Difference (n=7)	0	14	29	29	29

Question #6 <i>How did the assessment strategies work in this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M3.1: Let's Look At Our Actions (n=7)	14	0	14	14	57
M3.2: How Do You Want Your Future World To Be? (n=7)	0	0	14	14	71
M3.3: The Survey Says... (n=7)	14	14	14	14	43
M3.4: On The Other Hand (n=7)	0	0	0	0	100
M3.5: Caring For The Earth (n=7)	0	0	29	29	43
M3.6: We All Can Make A Difference (n=7)	0	14	43	14	29

Question #7 <i>How well did this Module LEs learning centre work to support your student's independence and collaborative learning?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M3.1: Let's Look At Our Actions (n=7)	0	14	14	14	57
M3.2: How Do You Want Your Future World To Be? (n=7)	0	0	14	14	71
M3.3: The Survey Says... (n=7)	0	14	29	14	43
M3.4: On The Other Hand (n=7)	0	0	0	0	100
M3.5: Caring For The Earth (n=7)	0	0	29	29	43
M3.6: We All Can Make A Difference (n=8)	0	0	38	38	25

Question #8 <i>Did you use any of the BLMs or TBLMs with this Module LE?</i>	Yes (%)	No (%)
M3.1: Let's Look At Our Actions (n=7)	29	71
M3.2: How Do You Want Your Future World To Be? (n=6)	33	67
M3.3: The Survey Says... (n=7)	29	71
M3.4: On The Other Hand (n=6)	17	83
M3.5: Caring For The Earth (n=7)	29	71
M3.6: We All Can Make A Difference (n=7)	57	43

Question #9 <i>Did you modify any of the BLMs for your student use?</i>	Yes (%)	No (%)
M3.1: Let's Look At Our Actions (n=7)	0	100
M3.2: How Do You Want Your Future World To Be? (n=7)	14	86
M3.3: The Survey Says... (n=7)	0	100
M3.4: On The Other Hand (n=7)	0	100
M3.5: Caring For The Earth (n=7)	0	100
M3.6: We All Can Make A Difference (n=7)	0	100

Question #10 <i>How did your students use the BLMs?</i>	On Paper	On Computer	Did Not Use Any BLMs (%)
M3.1: <i>Let's Look At Our Actions</i> (n=6)	33	0	67
M3.2: <i>How Do You Want Your Future World To Be?</i> (n=7)	29	14	57
M3.3: <i>The Survey Says...</i> (n=7)	29	0	71
M3.4: <i>On The Other Hand</i> (n=7)	14	0	86
M3.5: <i>Caring For The Earth</i> (n=7)	29	0	71
M3.6: <i>We All Can Make A Difference</i> (n=7)	86	14	0

Question #11 <i>Would you recommend this Module LE to a colleague?</i>	Yes (%)	No (%)
M3.1: <i>Let's Look At Our Actions</i> (n=7)	86	14
M3.2: <i>How Do You Want Your Future World To Be?</i> (n=7)	71	29
M3.3: <i>The Survey Says...</i> (n=7)	86	14
M3.4: <i>On The Other Hand</i> (n=7)	57	43
M3.5: <i>Caring For The Earth</i> (n=7)	86	14
M3.6: <i>We All Can Make A Difference</i> (n=7)	86	14

Appendix G: Module 4 Feedback

There were two learning experiences in Module 4.

- M4.1 *Climate Change Awareness Week*
- M4.2 *Looking Back...Looking Ahead*

There were eleven questions in the online feedback form for Module 4. Question 12 allowed pilot teachers an opportunity to share their comments.

- Question 1: Did you use this Module Learning Experience (LE) with your students?
- Question 2: Do you plan to use this Module LE with your students next year?
- Question 3: How well did this Module LE connect to the *Climate Change Awareness Week* culminating task?
- Question 4: How well did the learning resources help in conducting this Module LE?
- Question 5: How did activating, acquiring, and applying strategies work in this Module?
- Question 6: How did the assessment strategies work in this Module LE?
- Question 7: How well did this Module's LE learning centre work to support your students' independence and collaborative learning?
- Question 8: Did you use any of the BLMs or TBLMs with this Module LE?
- Question 9: Did you modify any of the BLMs for your student use?
- Question 10: How did your students use the BLMs?
- Question 11: Would you recommend this Module LE to a colleague?

The results are displayed as rounded percentages.

Question #1 <i>Did you use this Module Learning Experience (LE) with your students?</i>	Yes (%)	No (%)
M4.1: Climate Change Awareness Week (n=6)	67	33
M4.2: Looking Back...Looking Forward (n=6)	50	50

Question #2 <i>Do you plan to use this Module LE with your students next year?</i>	Yes (%)	No (%)
M4.1: Climate Change Awareness Week (n=6)	83	17
M4.2: Looking Back...Looking Forward (n=6)	83	17

Question #3 <i>How well did this Module LE connect to the Climate Change Awareness Week culminating task?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M4.1: Climate Change Awareness Week (n=6)	0	0	0	67	33
M4.2: Looking Back...Looking Forward (n=6)	0	0	17	33	50

Question #4 <i>How well did the learning resources help in conducting this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M4.1: Climate Change Awareness Week (n=6)	0	0	0	67	33
M4.2: Looking Back...Looking Forward (n=6)	0	0	17	33	50

Question #5 <i>How did the activating, acquiring and applying strategies work in this Module?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M4.1: Climate Change Awareness Week (n=6)	0	0	17	50	33
M4.2: Looking Back...Looking Forward (n=6)	0	0	33	17	50

Question #6 <i>How did the assessment strategies work in this Module LE?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M4.1: Climate Change Awareness Week (n=6)	0	17	0	50	33
M4.2: Looking Back...Looking Forward (n=6)	0	0	33	17	50

Question #7 <i>How well did this Module LEs learning centre work to support your student's independence and collaborative learning?</i>	Not At All (%)	Slightly (%)	Significantly (%)	Greatly (%)	Did Not Use this LE (%)
M4.1: Climate Change Awareness Week (n=6)	0	0	0	67	33
M4.2: Looking Back...Looking Forward (n=6)	0	0	33	17	50

Question #8 <i>Did you use any of the BLMs or TBLMs with this Module LE?</i>	Yes (%)	No (%)
M4.1: Climate Change Awareness Week (n=6)	50	50
M4.2: Looking Back...Looking Forward (n=6)	50	50

Question #9 <i>Did you modify any of the BLMs for your student use?</i>	Yes (%)	No (%)
M4.1: Climate Change Awareness Week (n=6)	0	100
M4.2: Looking Back...Looking Forward (n=6)	0	100

Question #10 <i>How did your students use the BLMs?</i>	On Paper	On Computer	Did Not Use Any BLMs (%)
M4.1: Climate Change Awareness Week (n=6)	33	17	50
M4.2: Looking Back...Looking Forward (n=6)	50	0	50

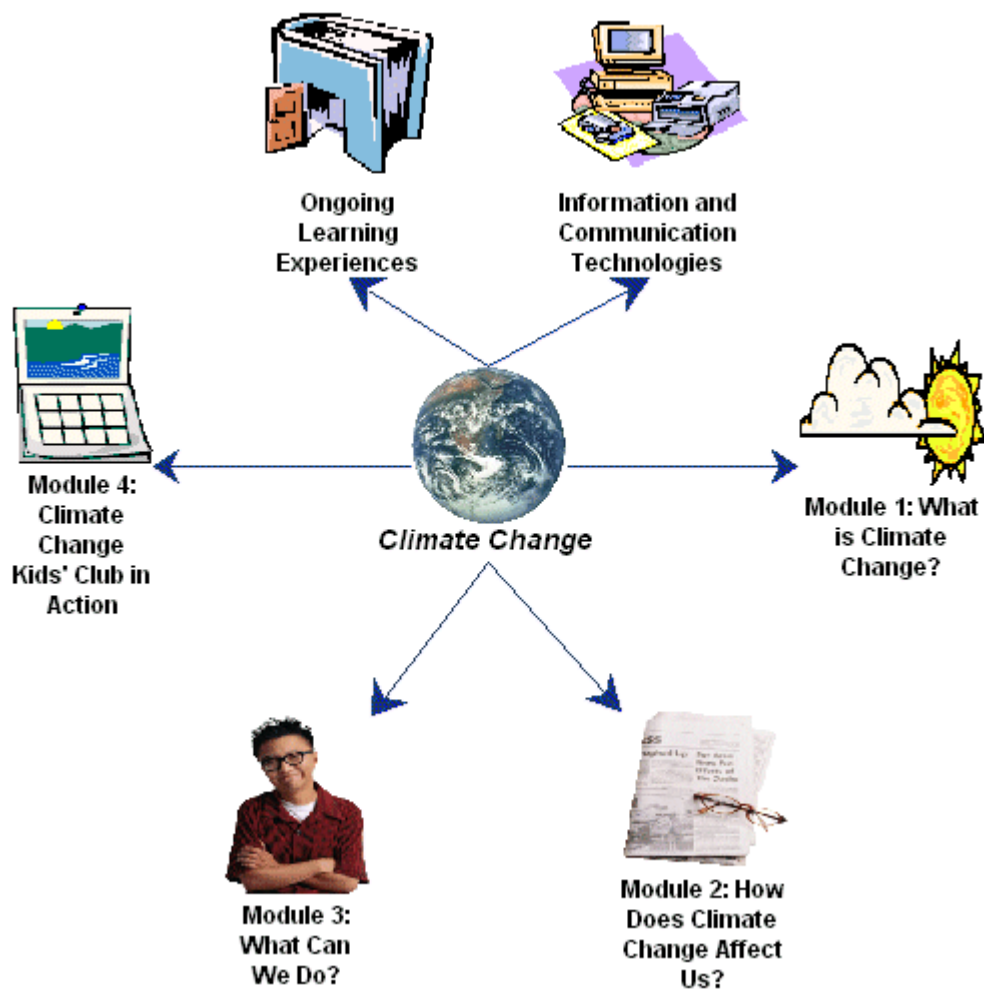
Question #11 <i>Would you recommend this Module LE to a colleague?</i>	Yes (%)	No (%)
M4.1: Climate Change Awareness Week (n=6)	100	0
M4.2: Looking Back...Looking Forward (n=6)	83	17

Appendix H: Climate Change Concept Maps and Overview Charts

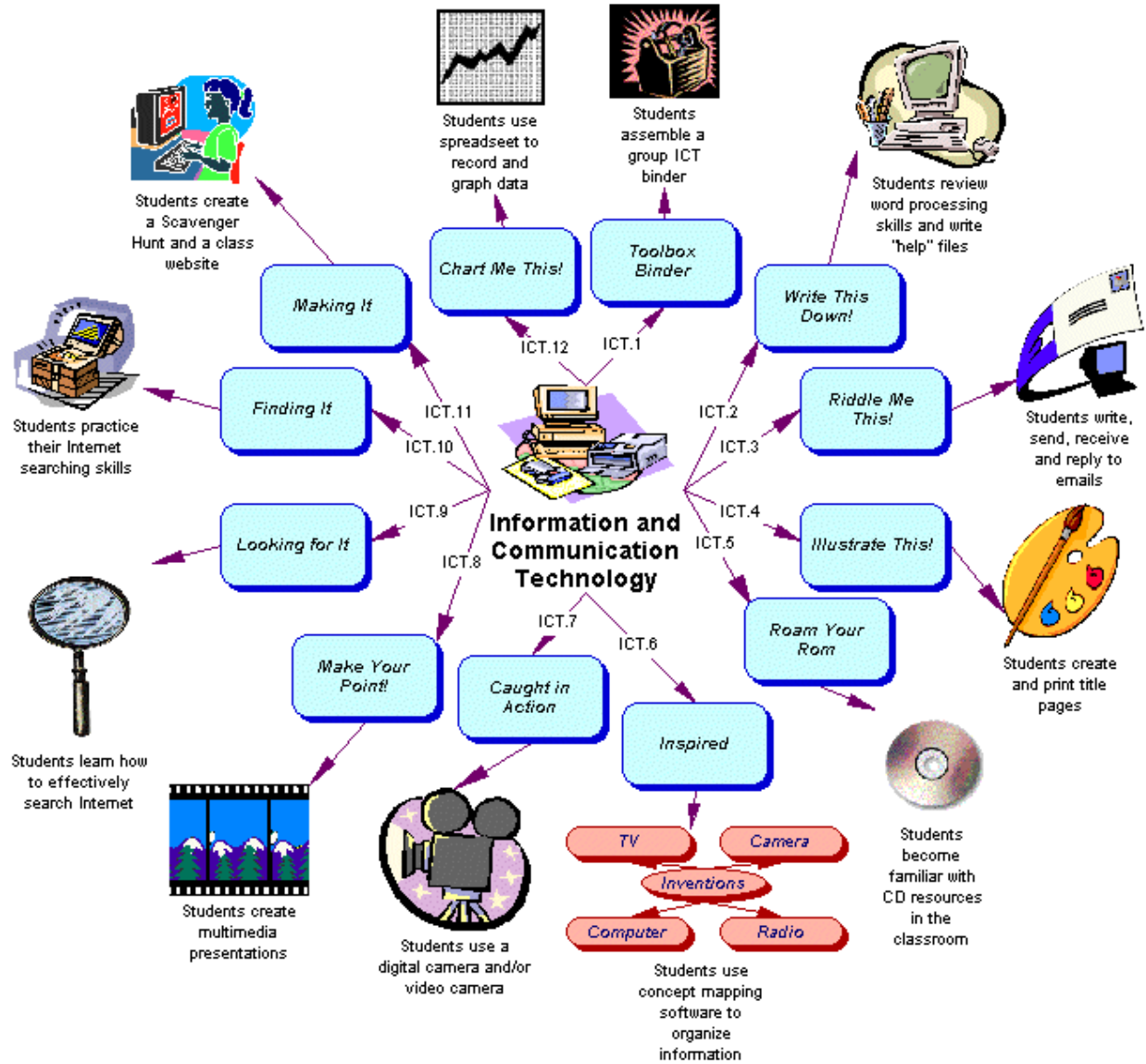
Overview

Overview: The Big Picture			
<p><i>The Big Picture</i> provides students with an overview of the <i>Climate Change</i> interdisciplinary unit. They become aware of the importance of citizenship, and how our social, economic, and environmental needs interact. Students create their own Climate Change Kids' Club to organize their efforts as global citizens, and to help them become activists as they work to make a positive impact on climate change. They begin the interdisciplinary unit with the end in mind, as they continuously plan and prepare for the culminating task of the Climate Change Awareness Campaign.</p> <p>Following are descriptions of the two learning experiences that make up <i>The Big Picture</i>.</p>			
Learning Experience Title	Estimated Time	Learning Experience Overview	Learning Centres
BP.1 <i>Building Connections – Introduction to the Climate Change Unit</i>	200 minutes	In this learning experience students are introduced to the workings of the interdisciplinary unit, the creation of the <i>Climate Change Kids' Club</i> , and the implementation of the <i>Climate Change Awareness Campaign</i> . Students make predictions for the unit and share their prior knowledge of climate change. Students discuss the importance of citizenship and what it means to be a global citizen. They take an initial look at how issues can be seen from social, economic and environmental perspectives. They begin to build connections between citizenship, sustainable development, and climate change.	BLM BP.1#2: <i>Climate Change Challenge</i> BLM BP.1#3: <i>Reflection Journal</i> BLM BP.1#5: <i>Climate Change In The News</i> <i>(Note: These centres can be used continually throughout the unit.)</i>
BP.2 <i>Creation of the Climate Change Kids' Club</i>	120 minutes	Students develop a collaborative approach to taking action at the school or community level regarding climate change. They discuss the importance of citizenship, and the role that being a good citizen plays in tackling the issue of climate change. Students collaborate to create the identity of their <i>Climate Change Kids' Club</i> , and to activate their interest and enthusiasm in taking on the role of activist to make changes and to educate others.	BLM BP.2#1: <i>Creation of the Climate Change Kids' Club</i>

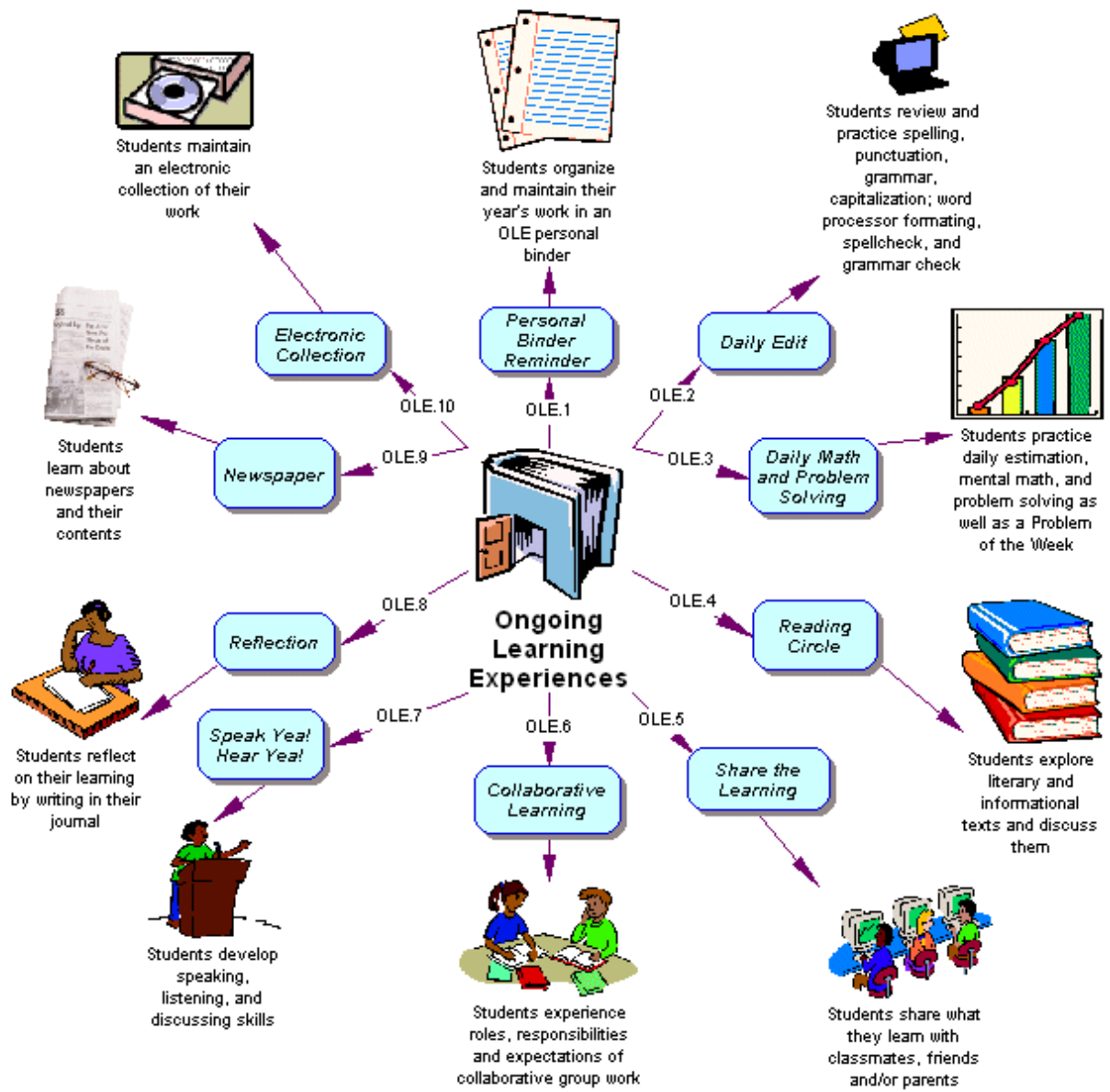
Table 32: Overview



ICTs



OLEs



Module 1

Module 1: What is Climate Change?

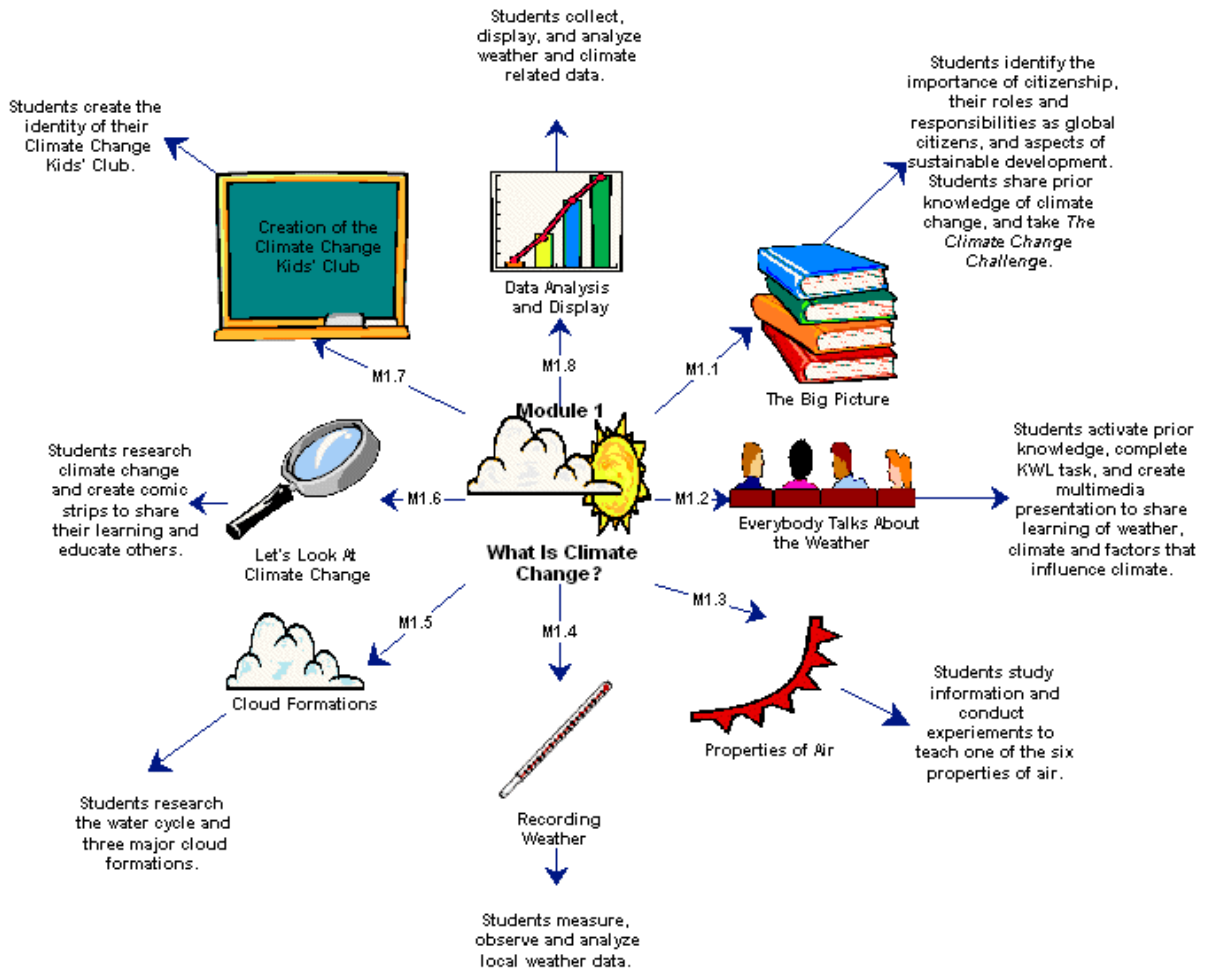
In this first module of the *Climate Change* interdisciplinary unit, students develop their knowledge of weather and climate, and begin to look at what climate change is all about. Students familiarize themselves with various aspects of weather and climate. They identify what climate change is, and causes of climate change across the regions of Canada. They continue the interdisciplinary unit with the end in mind, as they continuously plan and prepare for the culminating task of the *Climate Change* Awareness Campaign.

Following are descriptions of the four learning experiences that make up *What is Climate Change?*

Learning Experience Title	Estimated Time	Learning Experience Overview	Aboriginal Perspectives	Learning Centres
M1.1 <i>Everybody Talks About the Weather</i>	800 minutes	In this learning experience, students take an active role in their study of weather. They conduct experiments to teach the properties of air. Students work to distinguish between weather and climate, and to identify the factors that influence climate. They also use the inquiry process to learn more about the water cycle, cloud formations, and fronts. Students collect, record, and analyze daily weather conditions using first and second hand sources. They use this data to take on the role of meteorologist, and create daily weather reports to be shared in the school. Students demonstrate their learning through the creation of multimedia slides, rap songs, timelines, spreadsheets and graphs.		BLM M1.1#9: <i>Warm and Cold Fronts</i> BLM M1.1#12: <i>How's the Weather</i> <i>(Note: This centre can be used throughout the unit.)</i> BLM M1.1#15: <i>The Water Cycle</i> BLM M1.1#17: <i>Cloud Formations</i> BLM M1.1#20: <i>Weather and Climate</i> BLM M1.1#22: <i>Temperature and Precipitation</i>

<p>M1.2</p> <p><i>Working With Data</i></p>	<p>200 minutes</p>	<p>In this learning experience students collect weather and climate related data and display it in a variety of ways. They analyze the data and share their conclusions.</p>	<p>-guest speakers, including elders, to share how weather affects people in their work -identify traditional knowledge used in predicting weather -class discussion on aboriginal perspectives</p>	<p>BLM M1.2#1: <i>Comparing Canadian Cities</i></p>
<p>M1.3</p> <p><i>Why is Our Climate Changing?</i></p>	<p>420 minutes</p>	<p>In this learning experience, students develop their understandings of what climate change is, and identify the factors affecting global climate. Students brainstorm for what they know about climate change and research climate change to find its causes. Students write email letters to obtain further climate change information from environmental, social and economic groups. Students create comic strips that will share their learning and help in educating other students about climate change.</p>	<p>-discuss how climate has historically changed -Winter counts</p>	<p>BLM M1.3#4: <i>Climate Change Comics</i></p> <p>BLM M1.3#5: <i>Climate Change Newspaper</i> (Note: This centre can be used throughout the unit.)</p>
<p>M1.4</p> <p><i>Climate Climaxes</i></p>	<p>60 minutes each session</p>	<p>Students conduct reading circles using literature materials that relate to climate change to enhance their interest, learning and understanding of climate change, and to examine their own personal response to the texts.</p>	<p>-include texts that share Aboriginal perspectives/ written by Aboriginal authors where available</p>	<p>BLM M1.4#1: <i>Climate Change Reading Circle</i> (Note: This centre can be used throughout the unit)</p>

Table 33: Module 1



Module 2

Module 2: How Does Climate Change Affect Us?

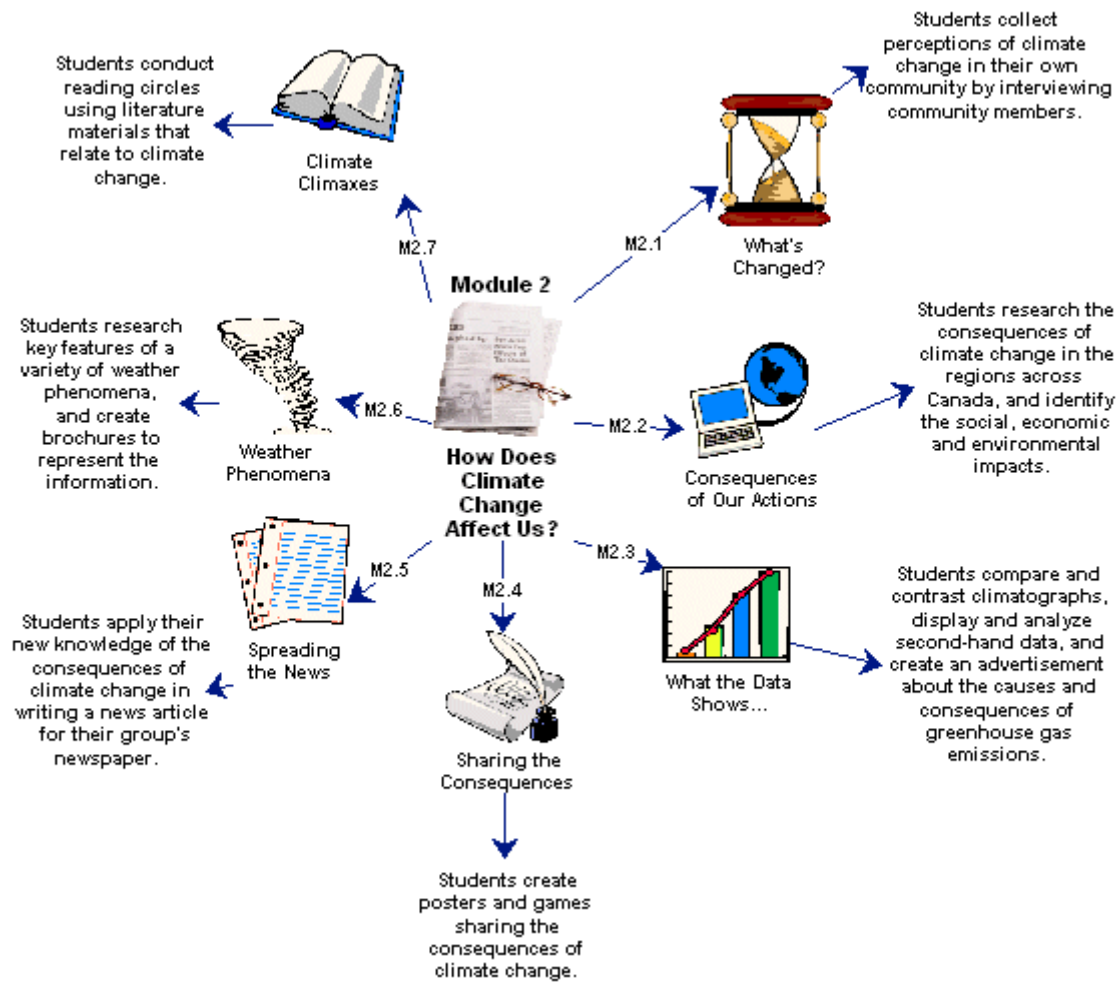
Module 2 of the *Climate Change* interdisciplinary unit takes students through learning experiences that focus on the consequences of climate change, and the social, economic and environmental impacts those consequences have. Students prepare projects to educate others about the consequences of climate change to be shared during the Climate Change Awareness Campaign.

Following are descriptions of the three learning experiences that make up *How Does Climate Change Affect Us?*

Learning Experience Title	Estimated Time	Learning Experience Overview	Aboriginal Perspectives	Learning Centres
M2.1 <i>Consequences of Climate Change</i>	480 minutes	In this learning experience, students use the Jigsaw strategy to research the consequences of climate change in the regions across Canada, and identify social, economic and environmental impacts. They research key features of a variety of weather phenomena, including thunderstorms, blizzards, chinooks, floods, tornadoes and sundogs, representing their information in a brochure. To educate others on the consequences of climate change across Canada, students create posters, games, and expository texts.	-research to identify consequences of climate change using Aboriginal Perspective resources: <i>No Word for Robin?</i> audio interviews, Nature of Things 5-part Arctic mission series (if available), <i>Sila Alangotok: Inuit Observations on Climate Change</i> video -class discussion of aboriginal perspectives using <i>Aboriginal-Based Criteria for Determining the Significance of Environmental Effects</i> website	BLM M2.1#3: <i>Surface Temperature Analysis</i> BLM M2.1#5: <i>Sharing the Consequences</i> BLM M2.1#7; <i>Spreading the News</i> BLM M2.1#11: <i>Weather Phenomena</i>

<p>M2.2</p> <p><i>What's Changed?</i></p>	<p>180 minutes</p>	<p>In this learning experience students collect perceptions of local climate change from community members. Students survey community members of various generations on their perceptions of climate change. They develop interview questions to further investigate how people at the local level feel they have experienced climate change, and how they have seen the climate change in their own community. Students graph the data collected through the survey, and write paragraphs sharing their findings and conclusions. They arrange their information along a timeline of when the people they interview were born.</p>	<p><i>-Sila Alangotok: Inuit Observations On Climate Change</i> video</p> <p><i>-survey elders in community to gather perspectives on climate change</i></p> <p><i>-class discussion of aboriginal perspectives</i></p>	<p>BLM M2.2#1: <i>Climate Change in Our Community</i></p>
<p>M2.3</p> <p><i>What the Data Shows...</i></p>	<p>180 minutes</p>	<p>In this learning experience students analyze and display data from second-hand sources to see how it correlates with climate change. Students apply their findings by creating an advertisement that shares the causes and consequences of greenhouse gas emissions.</p>		<p>BLM M2.3#1: <i>CO₂ Concentrations</i></p> <p>BLM M2.3#6: <i>The Facts on Greenhouse Gas Emissions</i></p>

Table 34: Module 2



Module 3

Module 3: What Can We Do?

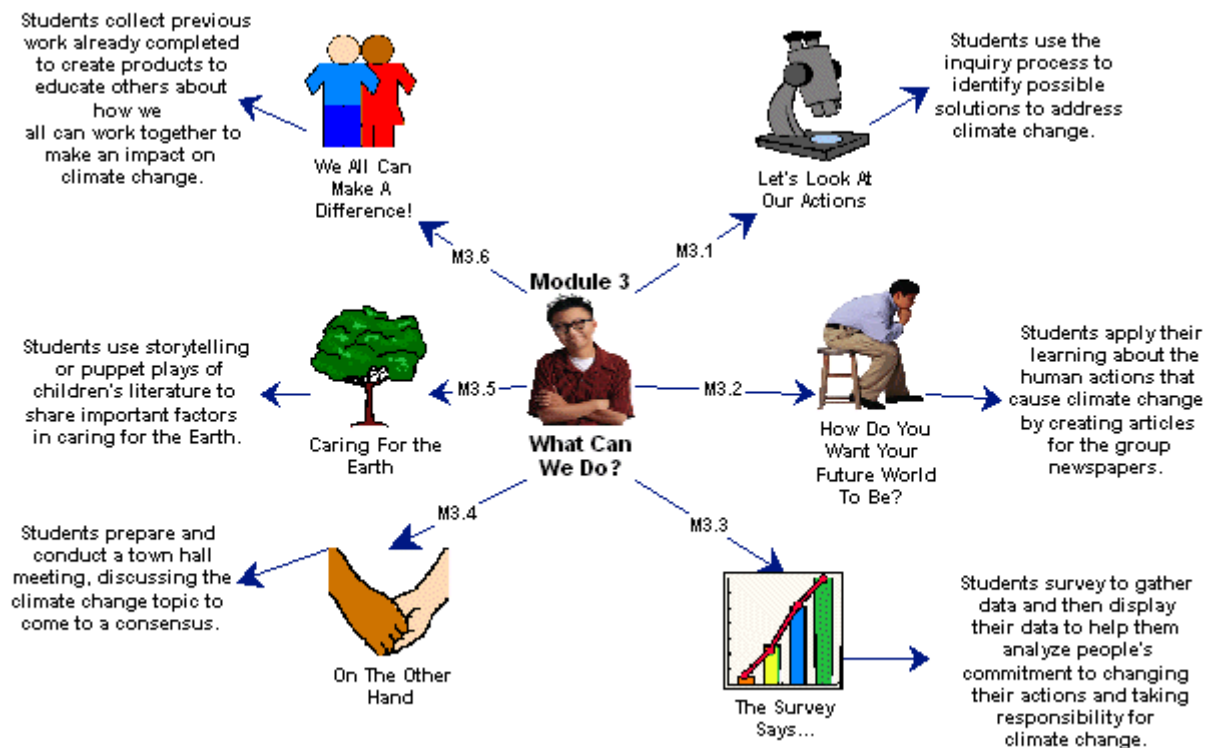
This module focuses on the actions students can take to make a difference in slowing the rate of climate change. Through the learning experiences in this module of the *Climate Change* interdisciplinary unit, students prepare to take action and to educate others about climate change. They continue to plan and prepare for the Climate Change Awareness Campaign throughout the module.

Following are descriptions of the three learning experiences that make up *What Can We Do?*

Learning Experience Title	Estimated Time	Learning Experience Overview	Aboriginal Perspectives	Learning Centres
M3.1 <i>Changing Our Ways</i>	480 minutes	In this learning experience, students use the inquiry process to identify solutions that might slow climate change, as well as actions they can take to change the human behaviours that make the greatest impact on our climate. They evaluate their personal greenhouse gas emissions, and identify ways to reduce them. Students take part in, and promote the One Tonne Challenge. Students collect data on local idling behaviours, and create Anti-Idling materials to promote changes in the community's idling habits.		BLM M3.1#5: <i>One-Tonne Challenge Learning Centre</i> BLM M3.1#8: <i>Anti-Idling Learning Centre</i>
M3.2 <i>The Survey Says...</i>	540 minutes	In this learning experience, students survey to gather data and then display their data to help them analyze people's commitment to changing their actions and taking responsibility for climate change. They create and interpret graphs to share their conclusions in the group climate change newspapers. Students work to identify people's connection with the Earth, and how as responsible citizens we must all do our part. Students create products to educate others about taking action on climate change, and to encourage people to make personal changes.	-elders speak to class sharing people's connection with the environment and practices that have shown caring for the Earth -legends -storytelling -class discussion of aboriginal perspectives	BLM M3.2#3: <i>It's Up To You! Learning Centre</i> BLM M3.2#4: <i>Caring for the Earth Learning Centre</i> BLM M3.2#5: <i>We All Can Make A Difference Learning Centre</i>

M3.3 <i>Climate Change Round Table</i>	240 minutes	In this learning experience students generate topics related to climate change that could be seen from different perspectives. Students then prepare and conduct a round table discussion. Students represent economic, social and environmental groups while discussing the topics to come to a consensus.	-consensus building -use of talking stick	
---	-------------	---	--	--

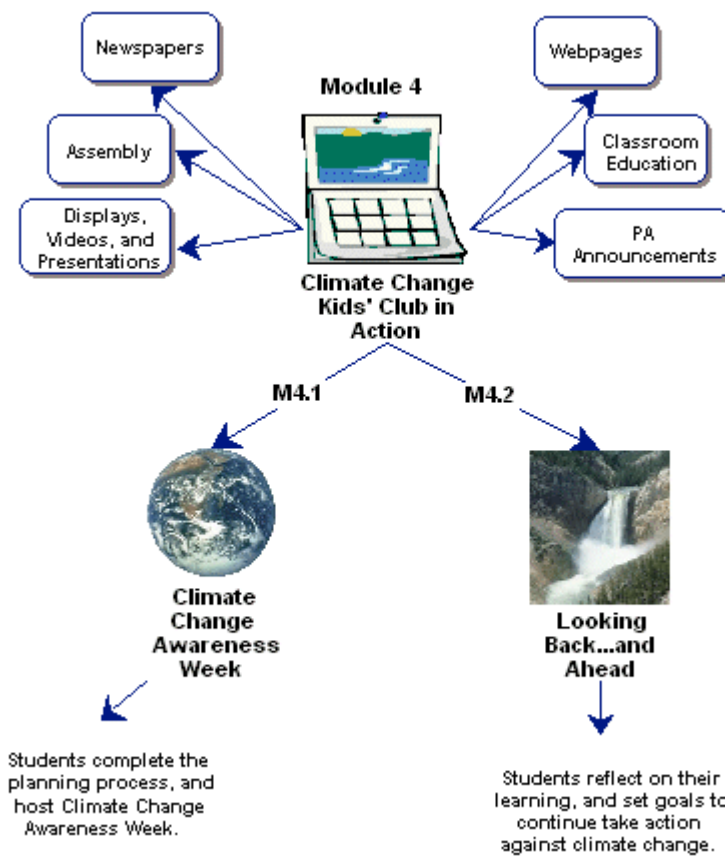
Table 35: Module 3



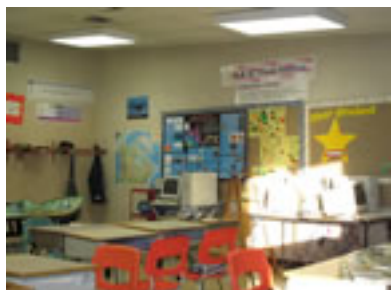
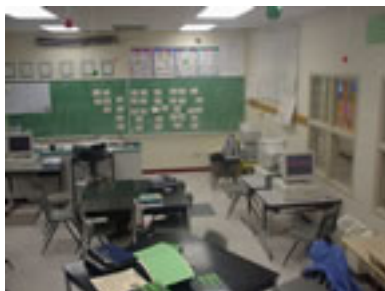
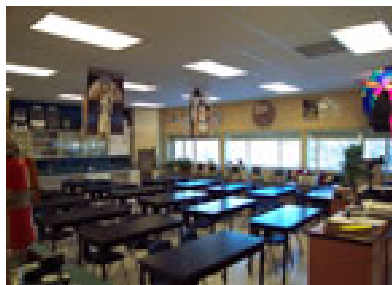
Module 4

Module 4: Climate Change Awareness		
<p>This module is the culmination of the interdisciplinary unit, <i>Climate Change</i>. Students have learned about climate change: what it is, how it affects us, and what we can do. They now take on the role of “activists” as they aim to educate others about climate change, and to encourage them to do their part by hosting their Climate Change Awareness Campaign. Afterwards, students take time to reflect on their learning and their actions related to climate change, and set personal goals for continuing to take action against climate change.</p> <p>Following are descriptions of the two Learning Experiences that make up Climate Change Awareness.</p>		
Learning Experience Title	Estimated Time	Learning Experience Overview
CCA.1 <i>Climate Change Kids’ Club In Action</i>	180 minutes	This learning experience is the culmination of the <i>Climate Change</i> interdisciplinary unit. Students have completed a variety of tasks and have a wide range of products to show for their efforts. Students celebrate their learning, and take on their roles as “Students as Activists” against climate change by educating others and encouraging them to do their part as responsible citizens. Students have planned and prepared for this time of celebration and education, and now implement their <i>Climate Change Awareness Campaign</i> .
CCA.2 <i>Looking Back...Looking Ahead</i>	240 minutes	Students review their learning in the <i>Climate Change</i> interdisciplinary unit, and reflect on their actions during the <i>Climate Change Awareness Campaign</i> . They discuss how they will apply their climate change learning in their daily lives, and set personal goals for continuing to take action against climate change. Students take the one-time only <i>Climate Change Challenge</i> , and calculate their personal greenhouse gas emissions, noting changes they have already made in their actions.

Table 36: Module 4



Appendix I: Photos of IMYM Classrooms





Appendix J: Glossary

Communication Centre:

The *Communication Centre* is located within the IMYM Online Learning Community. The *Communication Centre* is an online threaded discussion board in which pilot teachers

- email
- asynchronously post messages on a thematic and threaded discussion board
- synchronously “chat”
- review a calendar of events
- share files and online resources with other pilot teachers.

IMYM:

Interdisciplinary for Middle Years Multimedia

(<http://www.edu.gov.mb.ca/k12/tech/imym/index.html>)

IMYM Online Learning Community:

The IMYM Online Learning Community uses WebCT™ software in an effort to build relationships among IMYM teachers.

Information and Communication Technology (ICT) Learning Experience:

ICT learning experiences introduce new technology skills in the context of current curriculum outcomes. ICT learning experiences are in preparation for interdisciplinary work integrating technology. There are twelve ICTs (Information and Communication Technology) learning experiences in the *Climate Change* interdisciplinary unit.

- ICT.1 *Toolbox Binder*
- ICT.2 *Write This Down*
- ICT.3 *Riddle Me This*
- ICT.4 *Looks Like This*
- ICT.5 *Roam Your ROM*
- ICT.6 *Inspired*
- ICT.7 *Caught in Action*
- ICT.8 *Make Your Point*
- ICT.9 *Looking for It*
- ICT.10 *Finding It*
- ICT.11 *Making It*
- ICT.12 *Chart Me This*

Teachers choose from among the ICT learning experiences in order to introduce a particular ICT tool to their students in the curricular context of their choice. ICT learning experiences are not repeated, nor is it necessary to do each one.

Interdisciplinary Units:

There have been five IMYM interdisciplinary units to date. The *Climate Change* pilot study was the fifth interdisciplinary unit which integrates learning outcomes from at least two subject areas.

Ongoing Learning Experiences (OLE):

OLEs integrate the use of ICT with classroom routines. These learning experiences begin at the start of the school year and continue throughout the school year. There are ten OLEs (Ongoing Learning Experiences) in the *Climate Change* interdisciplinary unit

- OLE.1: *Binder Reminder*
- OLE.2: *Daily Edit*
- OLE.3: *Daily Math and Problem Solving*
- OLE.4: *Reading Circle*
- OLE.5: *Share the Learning*
- OLE.6: *Collaborative Learning*
- OLE.7: *Speak Yea! Hear Yea!*
- OLE.8: *Reflection Journal*
- OLE.9: *Newspaper*
- OLE.10: *Electronic Collection*

Each OLE provides a different task for the students to complete either daily, weekly, or monthly throughout the school year

Sharing Centre:

The *Sharing Centre* is located within the IMYM Online Learning Community. The *Sharing Centre* is a folder in which pilot teachers share student samples and classroom photos with each other throughout the pilot study.