

## CHAPTER 5

### SYNTHESIS

This investigation is about the integration of computer-assisted education at Pinelands High School. In the literature study there was an investigation into a definition of computer-assisted education and developmental models of the integration of computer-assisted education. A new model of the integration of computer-assisted education was created, the **Evolutionary Model**. In this chapter computer-assisted education at Pinelands High School will be discussed in the light of the definition, infrastructure and model.

## 1 Evolutionary Model

### 1.1 Implementation of the prerequisite infrastructure of the Evolutionary Model at Pinelands High School

#### 1.1.1 Staff

In the foundation of the **Evolutionary Model** of the integration of computer-assisted education the staff should be

- able to practise using the computer out of class;
- enabled to use the computer as a personal tool;
- given time in school for training and research;
- play an active role from design and planning to the evaluation stage;
- financially assisted to purchase their own computers to use at home;
- financially assisted to purchase the same software as that used at school;
- provided with access to program-expertise when necessary;
- provided with loaned computers for home usage; and
- encouraged to share enthusiasm and celebrate initiative.

## University of Pretoria

Pinelands High School staff are assisted in practicing to use the computer out of the classroom, at home, by means of the financial assistance given them by the school's low cost loans to purchase hardware. Fourteen of the 40 staff members surveyed have used the school's financial scheme to purchase a computer. In-house computer training using the word processor has been provided and 25 staff members or 62% have received training. Eight staff members, six of whom were from the computer teaching department, have made use of the school's financial assistance to attend a course or conference on computers. In the Mathematics and Music departments there is the necessary training for the integration of computer-assisted education using applications which those departments have bought.

Of the surveyed staff, 75% have had input into the school's long term planning but only 23% have had any input into the plans for the computer department. The staff are not financially assisted to purchase the same software for home use as that used at school. The staff are able to get application expertise from staff in the computer department, or so they believe, as shown in Figure 4.10. Should they wish, to the staff are able to borrow a computer for home use.

Of a surveyed staff of 40, 16 have shared their experiences with teachers in their department, 11 with adults in the school, 13 with teachers not from Pinelands High School and two have published articles relating their experiences using the computer in the class. This data plus the fact that only 23% of the staff have had any input into the computer department decision-making would indicate that the vision, enthusiasm and expertise of computer-assisted education is not being shared with the Pinelands High School staff.

### 1.1.2 School

In the foundation of the **Evolutionary Model** the school should allocate resources prudently. It should

- initially focus on a few successful classrooms, teachers or subjects;
- eliminate technical obstacles with technical staffing and enough financial planning;
- involve the principal, school management team and support staff as well as teachers;

## University of Pretoria

- practice what it preaches with regard to learning theory, i.e. train the staff in the theory being used in the classroom;
- make technology and computers part of the overall planning to increase student learning;
- introduce a system of 'buddies' where enthusiastic staff are partnered with those who are reluctant to use technology;
- provide adequate resources for the desired outcomes;
- take cognisance of the school's dominant teaching/learning style, for example, whether it is the traditional 'factory' approach or cooperative group work;
- provide time for joint decision making and planning;
- select software with broad usage; and
- share the vision and goals of computer-assisted education.

Pinelands High School has allocated resources prudently in purchasing mainly content-free applications which can be used in a number of subject departments as indicated in Tables 4.15 and 4.16. Funding problems have been eliminated with the involvement of three members of the Board of Governors on the computer committee, hence the school's financial authorities should be aware of the needs of the computer department. The school has endeavoured to eliminate technical obstacles by appointing a network administrator.

Pinelands High School has not managed to involve the principal, management team, support staff and the teachers in the planning and vision of computer-assisted education. Only 23% of the staff surveyed, which included the management team, support staff and teachers, have had input into the long term plans for the computer room. The Computer Literacy subject department has involved most of their teachers in the decision-making of the department as indicated in Table 4.18.

Staff training in computer-assisted education in the **Evolutionary Model** should be conducted in the teaching method employed in the school and in particular in the computer department. Staff *training* in computers at Pinelands High School is done in the traditional 'factory' method with one person per computer although the number of computers available in the computer room prevents *teaching* in the traditional 'factory' method with the majority of classes which use the room. Six teachers in the Computer Literacy, English, Graphics and Mathematics subject departments are being mentored by another teacher in computer-related teaching.

## University of Pretoria

The school should provide adequate resources for the desired outcomes. At the school the outcomes with regard to computer-assisted education have not been specified or published. There is no mission statement in the computer department.

The school has not taken cognisance of its teaching style which is the traditional 'factory' approach where every student requires his own computer station. The average class in standards six or seven is 36.3 students and there are only 21 computers available for class teaching. Staff have received training in cooperative group work but not group work using the computer.

### 1.1.3 Community involvement

Community involvement and private sector support can be gained by means of communicating the successes and problems of the computer department; and by offering training sessions using the school's facilities in current application packages.

The Continuing Education Department at Pinelands High School offers computer courses to the public using the school's equipment and facilities. Information about using the computers at school is shared with the parents.

### 1.1.4 Conclusion with regard to the prerequisite infrastructure of the Evolutionary Model

The school has done much to lay a good foundation for the integration of computer-assisted education. A few factors need to be addressed to assist in the process:

- The vision of computer-assisted education must be shared with all staff members.
- Initiative in and enthusiasm for computer-assisted education must be celebrated.
- Training in application use is needed.
- Training in using the computer in the classroom is needed.
- Staff training in computers must be done in the method to be used in teaching with computers.
- More computers are needed to take cognisance of the current teaching method of the school.

## 1.2 Implementation of the phases of the Evolutionary Model at Pinelands High School

The **Evolutionary Model** is divided into five phases to describe the integration of computer-assisted education in a school. The five phases are Introduction, Entry, Intermediate, Penultimate and Creation.

### 1.2.1 Phase 1: Introduction

In the Introduction phase of the **Evolutionary Model** computers and complimentary technology are installed, teacher training in using the word processor begun and a steering committee is identified. The computer is used mainly to support traditional teaching methods using drill-and-practice and word processing applications. The use made of the applications and their integration with each other, would indicate their level in the phases of the **Evolutionary Model** of computer-assisted education.

**Table 5. 1 Outcomes based on the Evolutionary Model Phase 1: Introduction - Instructional activity**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Computer use replicates traditional instructional and learning activities	Most work uses word processor, graphic or e-mail application	✓✓ ✓✓	Most work uses word processor, graphic or e-mail application	✓✓ ✓✓

**Table 5. 2 Outcomes based on the Evolutionary Model Phase 1: Introduction - Teacher interaction**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Identification of steering or organising committee	Computer committee for finances - computer subject department for teaching matters	✓✓ ✓✓	Senior staff involved with financing	✓
Training of teachers begins with word processing	Five of seven staff trained but all nevertheless competent	✓✓ ✓✓	63% of staff have had training	✓✓ ✓

**Table 5.3 Outcomes based on the Evolutionary Model Phase 1: Introduction - General school**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Installation of computers and complimentary technology	Done	✓✓ ✓✓	Done	✓✓ ✓✓

At the school the processing of information is the main activity in this Introductory phase. The use of the graphics, word processors and e-mail applications are the most common applications as seen in Figure 4.14. From Tables 5.1 to 5.3 one can see that Pinelands High School has completed the Introduction Phase 1.

### 1.2.2 Phase 2: Entry

In this Entry phase of the **Evolutionary Model** teachers start using the computer equipment in their teaching. As in the Introductory phase, the computer is used mainly to support traditional teaching methods using drill-and-practice and word processing applications. Teachers lose their fear of the technology with the aid of technical support.

**Table 5.4 Outcomes based on the Evolutionary Model Phase 2: Entry - Instructional activity**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Computers are used mainly in drill-and-practice or text-based work	Most work uses word processor, graphic or e-mail application	✓✓ ✓✓	Most work uses word processor, graphic or e-mail application	✓✓ ✓✓
Established teaching methods and activities are supported by computer technology	Methods - insufficient computers for each student based on established methods Activities - supported by work using word processor, graphic or e-mail application	✓✓  ✓✓ ✓✓	Methods - insufficient for each student based on established methods Activities - supported by work using word processor, graphic or e-mail application	✓✓  ✓✓ ✓✓
Technical assistance is given to students	Given by network administrator	✓✓ ✓✓	Given by network administrator	✓✓ ✓✓

**Table 5.5 Outcomes based on the Evolutionary Model Phase 2: Entry -**

**Teacher interaction**

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	✓✓ ✓✓	<b>WHOLE STAFF USING COMPUTERS</b>	✓✓ ✓✓
Stress levels of teachers is kept low with basic skill computer work	Have been given basic computer skills and believe able to get advice from colleagues in computer department	✓✓ ✓✓	Have been given basic computer skills and believe able to get advice from computer department	✓✓ ✓✓
Teacher interactions are mainly of a technical nature	Staff have moved beyond this point	✓✓ ✓✓	Staff have moved beyond this point	✓✓ ✓✓
Technical assistance is given to teachers	Technical assistance given by network administrator	✓✓ ✓✓	Technical assistance given by network administrator	✓✓ ✓✓
Training of educators begins initially in word processing	Five of seven staff trained but all competent nevertheless	✓✓ ✓✓	63% of staff have had training	✓✓ ✓

Most of the work done in the computer department at Pinelands High School is processing information using the word processor, graphics application or electronic mail as indicated in Figure 4.8. The teaching methods are traditional in many of the classes where students work on their own, each needing a computer. Of the staff who use the computer only 44% of the teachers would like the students to work in pairs. This would indicate that the staff prefer to use individualised traditional teaching methods. Of the total of 23 teachers who have used computer-assisted education, 21 use it for work directly connected to the curriculum.

At Pinelands High School the staff believe they are able to get advice and assistance from the computer department staff and network administrator as tabulated in Table 4.10. Stress levels are kept low because of the support from the staff of the computer department and the staff selecting their own entry level of computer-assisted education work. From Tables 5.4 and 5.5 above, one can note the level of computer-assisted education at Pinelands High School in this Entry Phase 2.

1.2.3 Phase 3: Intermediate

The Intermediate phase is the most dramatic in the **Evolutionary Model** of computer-assisted education. The teachers start using computers as a tool to achieve an educational objective. Content-free applications such as word processors, spreadsheets and databases are used. The role of the teacher changes from the focus of the lesson to facilitator of learning. Interactions with students change from sharing technical information to sharing instructional strategies. Teachers start using the computer in creative ways as they develop expertise in applications. The desire by teachers for additional technology begins to be felt.

**Table 5. 6 Outcomes based on the Evolutionary Model Phase 3: Intermediate - Instructional activity**

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	✓✓ ✓✓	<b>WHOLE STAFF USING COMPUTERS</b>	✓✓ ✓✓
Move from text-based instruction and drill-and-practice to word processors, databases, spreadsheets and graphics	No spreadsheet or database applications. Use word processor and graphic applications	✓✓	No spreadsheet or database applications. Use word processor and graphic application	✓✓
Role of teacher gradually changes from instructor to facilitator	Computer Literacy teachers call themselves facilitators	✓✓ ✓✓	All but one of the 16 non-Computer Literacy teachers who use the computer regard themselves as facilitators	✓✓ ✓✓
Students peer tutor	Students have to peer tutor while sharing same computer and doing individualised work as not enough computers	✓✓	Students have to peer tutor while sharing same computer and doing individualised work as not enough computers	✓✓



**University of Pretoria**

**Table 5.7 Outcomes based on the Evolutionary Model Phase 3: Intermediate - Teacher interaction**

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	✓✓ ✓✓	<b>WHOLE STAFF USING COMPUTERS</b>	✓✓ ✓✓
Collaboration on instructional topics between teachers	Computer Literacy teachers discuss and collaborate on lessons	✓✓ ✓✓	Mathematics and Geography teachers collaborate on lessons	✓✓
Teachers observe fellow teachers' classes	Mentoring takes place between four of the Computer Literacy staff	✓✓	In English, Graphics and Mathematics departments mentoring taking place in teaching with computers	✓✓

**Table 5.8 Outcomes based on the Evolutionary Model Phase 3: Intermediate - General school**

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	✓✓ ✓✓	<b>WHOLE STAFF USING COMPUTERS</b>	✓✓ ✓✓
Curriculum is modified to make use of the different technologies	Four of the seven Computer Literacy teachers link content of lessons to curriculum	✓✓	English, Environmental Science 1 and 2, Geography, Graphics, History and Mathematics departments deliberately modify their curriculum to integrate computers	✓✓ ✓✓

Tabulated in Tables 5.6 to 5.8 the activities of the teaching staff are described at the Intermediate phase. At Pinelands High School staff use the word processor and graphics applications as there are no spreadsheets or database applications on the network for teaching purposes. Creative use of the word processor and graphics applications is seen in the objectives staff have for their lessons seen in Figure 4.8.

The computer is used by 24% of the staff for objectives which could fall into the early phases of the **Evolutionary Model** but 12% use it for non specified encompassing objectives, illustrated in Figure 4.8, which are the initial stages of creative work using computer-assisted education.

The students have to peer tutor each other while working together as there are insufficient computers for one per child and many of the lessons are for individualised learning. Teachers who use the computer regard themselves as facilitators of learning as opposed to the focus of the lessons.

Collaboration and discussion between teachers is found in the Computer Literacy, Geography and Mathematics subject departments. In subject departments, 16 of the 23 teachers who use computer-assisted education discuss their computer experiences. Although only 16 of the 23 teachers share their experiences within their departments that sharing is mainly extended from the Computer Literacy subject department outwards so that other departments and individual teachers within the school are introduced to using the computer. The curriculum is modified in certain subjects to make use of the computer applications, for example using *Orbits* in Environmental Science 1 and 2, *PCGlobe* in Environmental Science 1 and 2 and *Geometer's Sketchpad* in Mathematics.

### 1.2.4 Phase 4: Penultimate

In this Penultimate phase of the **Evolutionary Model** the foundation built on over the previous three phases bears fruit. The curriculum is modified to make use of different technologies and the school timetable is rescheduled to allow for team teaching and mentoring. The method of teaching changes from behaviourist to constructivist learning where students are involved with collaborative and creative project work by constructing their own knowledge. The teacher becomes a collaborator as opposed to a facilitator. A number of applications are used in learning.

**University of Pretoria**

**Table 5. 9 Outcomes based on the Evolutionary Model Phase 4: Penultimate - Instructional activity**

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	<b>✓✓ ✓✓</b>	<b>WHOLE STAFF USING COMPUTERS</b>	<b>✓✓ ✓✓</b>
Constructivist approach to learning replaces the behaviourist approach	Not apparent	-	Not asked in questionnaire but ascertained from objectives of lessons it is developing in Mathematics department	✓
Different computer applications are used in learning	Computer Literacy teachers integrating and moving between graphics, word processor and databank applications	✓✓	Use single applications	-
Experimentation with student grouping	Not apparent	-	Not apparent	-
Role of teacher gradually changes from facilitator to collaborator	Not apparent	-	Not apparent	-
Students are actively involved in knowledge construction	Not apparent	-	Found in Mathematics department	✓
Students involved in collaborative and creative project work	Not apparent	-	Not apparent	-

**Table 5. 10 Outcomes based on the Evolutionary Model Phase 4: Penultimate - Teacher interaction**

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	<b>✓✓ ✓✓</b>	<b>WHOLE STAFF USING COMPUTERS</b>	<b>✓✓ ✓✓</b>
Experimental collaboration between teachers in interdisciplinary project-based learning	Found between Graphics and Computer Literacy teachers	✓	Not apparent	-

## University of Pretoria

**Table 5. 11 Outcomes based on the Evolutionary Model Phase 4: Penultimate - General school**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Desire for new technology and better technology	Not apparent	-	Not apparent	-
Modification of curriculum to make use of the different facilities	Deliberately expose students to new technologies	✓✓ ✓✓	Environmental Science 1 and 2, Geography, Graphics, History, Mathematics and Typing deliberately integrate computers into their curriculums	✓✓
School timetable is rescheduled for team teaching	Rescheduled in order for working between Graphics and Computer Literacy teachers	✓	Found in Mathematics department	✓
Students peer tutor	Students have to peer tutor while sharing same computer and doing individualised work as not enough computers	✓✓	Students have to peer tutor while sharing same computer and doing individualised work as not enough computers	✓✓

Tabulated above in Tables 5.9 to 5.11 the activities of the teaching staff are described at the Penultimate phase. At Pinelands High School the curriculum is modified in Environmental Science 1 and 2, Geography, Graphics, History and Mathematics to make use of the computer, and in Computer Literacy. The Mathematics department appears to be moving towards the constructivist approach to teaching in their use of the *Geometer's Sketchpad*. This was apparent when the Mathematics department staff individually wrote different objectives in using the computer in teaching, despite the fact that they had a choice of ready-made objectives from which to choose.

The Computer Literacy teachers use more than one application in their classes often moving between the word processor, graphics application and the databanks of *Orbits* and *PCGlobe*. There is collaboration between the teachers of Graphics and Computer Literacy. The school timetable has been rescheduled to allow for team teaching in Graphics and Mathematics.

The staff do not seem to be aware of other applications which they could use, as illustrated in Figure 4.18 where they were asked if they had access to particular

## University of Pretoria

applications. The school has neither a database nor spreadsheet application on the network. There is not an apparent desire for new technologies. There appears to be an ignorance of what applications the school has in the computer department, as illustrated in Figure 4.19.

### 1.2.5 Phase 5: Creation

This Creation phase in the integration of computer-assisted education is never completed as new technologies continue to be developed.

In this phase teachers use the technology to adapt to the student's learning styles, needs and preferences. With the new technology, computers and associated technologies, comes a total change in teaching/learning with collaborative learning, teacher mentoring, creation of knowledge, peer tutoring and active involvement of the students. Teachers reassess the system of grading work and the teaching organisation as a whole. The schedule of the school is reorganised to facilitate team teaching. Much of the learning is of a constructivist nature. Many applications are used in class work, a number of which are multimedia applications. Learning is exciting.

**Table 5. 12 Outcomes based on the Evolutionary Model Phase 5: Creation - Instructional activity**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Accommodation of more learning styles, individual needs and individual preferences	Not apparent	-	Not apparent	-
Active involvement of students in knowledge construction	Not apparent	-	Found in Mathematics department	✓

*Continued on next page*

## University of Pretoria

*continued from previous page*

<b>OUTCOME</b>	<b>COMPUTER DEPARTMENT STAFF</b>	<b>✓✓ ✓✓</b>	<b>WHOLE STAFF USING COMPUTERS</b>	<b>✓✓ ✓✓</b>
Assessment is either portfolio or authentic assessment	Not apparent	-	Not apparent	-
Balance between direct and project-based teaching	Not apparent	-	Not apparent	-
Constructivist approach to learning replaces behaviourist approach	Not apparent	-	Ascertained from objectives of lessons it is developing in Mathematics department	✓
Knowledge creation	Not apparent	-	Knowledge creation as method beginning to be applied in Mathematics department	✓
Many different computer packages used in learning	Computer Literacy teachers integrating and moving between word processor, graphics and databank applications	✓✓	Use single applications	-
Multimedia programs used	Have none	-	Have none	-
Students involved in collaborative and creative project work	Not apparent	-	Not apparent	-
Students peer tutor	Students have to peer tutor while sharing same computer and doing individualised work as insufficient computers	✓✓	Students have to peer tutor while sharing same computer and doing individualised work as insufficient computers	✓✓
Teacher acts as a collaborator in the learning process	Not apparent	-	Not apparent	-
Use of new technologies	The newest technology used is e-mail but that is no longer new technology	-	The newest technology used is e-mail but that is no longer new technology	-

## University of Pretoria

**Table 5. 13 Outcomes based on the Evolutionary Model Phase 5: Creation -  
Teacher interaction**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Interdisciplinary project-based learning	Not apparent	-	Not apparent	-
Team teaching	Found between Graphics and Computer Literacy teachers	✓	Found in Mathematics department	✓

**Table 5. 14 Outcomes based on the Evolutionary Model Phase 5: Creation -  
General school**

OUTCOME	COMPUTER DEPARTMENT STAFF	✓✓ ✓✓	WHOLE STAFF USING COMPUTERS	✓✓ ✓✓
Desire for new technology and better technology	Not apparent	-	Not apparent	-
Modification of the curriculum to make use of the different facilities	Deliberately expose students to new technologies	✓✓ ✓✓	Environmental Science 1 and 2, Geography, Graphics, History, Mathematics and Typing deliberately integrate computers into their curriculums	✓✓
School timetable rescheduled for team teaching	Rescheduled in order for working between Graphics and Computer Literacy teachers	✓	Found in Mathematics department	✓

In Tables 5.12 to 5.14 above the outcomes of each aspect of the phase are tabulated and indicate how and where they are found at Pinelands High School. There is almost a lack of any new outcomes in this Creation phase at Pinelands High School.

### 1.2.3 Conclusion with regard to the phases of the Evolutionary Model

Pinelands High School is at different levels of the integration of computer-assisted education based on the **Evolutionary Model**. The main outcomes from each of the different phases have been listed below showing the level at which they are found at Pinelands High School on the **Evolutionary Model**.

**Table 5. 15 Position of the Computer Literacy subject department in the five phases of the Evolutionary Model**

OUTCOMES		1	2	3	4	5
<b>Instructional activity outcomes</b>						
Number of applications used increases - from one to many						
Role of teacher changes - from facilitator to collaborator						
Teaching methods change - traditional to active involvement						
Type of applications used changes - wp to multimedia						
Type of learning changes - from behaviourist to constructivist						
<b>Teacher interaction outcomes</b>						
Interdisciplinary teamwork begins		NA	NA	NA	Gr	Gr
Teacher interactions change - from technical to collaborative						
Team teaching begins		NA	NA	Gr	Gr	Gr
Training in applications begun - from application to tool						
<b>General school outcomes</b>						
Curriculum modified to integrate computers		NA	NA			
Rescheduling of timetable		NA	NA	NA		

  

wp	Word processor	G	Geography
	Found at school	Gr	Graphics
	Found in small amounts	M	Mathematics
NA	Not applicable in this phase	NA	Not apparent

Table 5.15 above indicates the position of the Computer Literacy department in the five phases of the **Evolutionary Model**. Interdisciplinary Interactions are found between the Computer Literacy and Graphics subject departments. The training of the computer staff in the use of applications is still at the Phase 1, Introduction while General School Outcomes would indicate that the school is at Phase 5, Creation. In the section on Instructional Activity Outcomes the Computer Literacy subject department appears to be between Phases 3 and 4.



**Table 5. 16 Position of the integration of computer-assisted education at Pinelands High School in the five phases of the Evolutionary Model**

OUTCOMES		1	2	3	4	5
<b>Instructional activity outcomes</b>						
Number of applications used increases - from one to many						
Role of teacher changes - from facilitator to collaborator						
Teaching methods change - traditional to active involvement				M	M	
Type of applications used changes - wp to multimedia						
Type of learning changes - from behaviourist to constructivist					M	
<b>Teacher interaction outcomes</b>						
Interdisciplinary teamwork begins		NA	NA	NA		
Teacher interactions change - from technical to collaborative			MC	MC		
Team teaching begins		NA	NA			
Training in applications begun - from application to tool						
<b>General school outcomes</b>						
Curriculum modified to integrate computers		NA	NA			
Rescheduling of timetable		NA	NA	NA		

  

wp	Word processor	G	Geography
	Found at school	Gr	Graphics
	Found in small amounts	M	Mathematics
NA	Not applicable in this phase	NA	Not apparent

Table 5.16 above indicates the position of Pinelands High School on the **Evolutionary Model**. In the section on Instructional Activity Outcomes the school appears to be between Phases 3 and 4. Teacher Interaction Outcomes appear to be between Phases 1, Introduction, and 3, Intermediate. The training in the use of applications is still at Phase 1, Introduction, while General School Outcomes would indicate that the school is at Phase 5, Creation.

The foundation of the **Evolutionary Model** showed what the school has done to assist in the integration of computer-assisted education and its efforts can be seen in that the Computer Literacy subject department is between Phases 2 to 5. More training and additional software could help bring the Computer Literacy subject department and the general teaching staff of Pinelands High School into Phase 4 or 5.

## 2 Summary

### 2.1 Infrastructure to support computer-assisted education at Pinelands High School

Pinelands High School has provided the infrastructure for computer-assisted education in the manner below and has

- adapted the school organisation by timetabling Computer Literacy, Graphics, Mathematics and Typing classes in the computer room;
- endeavoured to meet the new demands of society by introducing the subject Computer Literacy to all standard six and seven students, and the subject Typing on the computer or keyboarding skills to older students;
- prevented gender stereotyping of computer expertise by having almost equal numbers of male and female Computer Literacy teachers;
- provided a certain level of hardware and the finance to maintain that hardware;
- provided sufficient finance for requested software;
- provided opportunities for general staff discussion on reform of the curriculum;
- provided staff computer training;
- stabilised the financing of the computer department; and
- supported computer-assisted education with technical staff in the form of a network administrator.

The foundation or infrastructure to support computer-assisted education at Pinelands High School was discussed in respect of staff, the school and the community. The instances where Pinelands High School was actively supporting computer-assisted education were cited as well as the factors which need to be addressed if the school wishes to make more effective use of its facilities.

### 2.2 Level of computer-assisted education based on the Evolutionary Model at Pinelands High School

This chapter has examined the level of integration of computer-assisted education at Pinelands High School using the **Evolutionary Model**. The **Evolutionary Model**

## University of Pretoria

was used to determine, in detail, the integration of computer-assisted education at Pinelands High School. The five different phases looked at the Instructional Activity Outcomes, Teacher Interaction Outcomes and General School Outcomes within each phase at Pinelands High School in the computer subject department and the general teaching staff.

**Table 5. 17 Level of computer-assisted education at Pinelands High School based on the Evolutionary Model**

PHASE	INTEGRATION BASED ON THE EVOLUTIONARY MODEL
1. Introduction	Completed by general and computer teaching staff
2. Entry	Completing by general and computer teaching staff
3. Intermediate	Change is taking place here, especially in the Mathematics and Graphics departments
4. Penultimate	Little evidence
5. Creation	Very little evidence

In the field of computer-assisted education, Pinelands High School, in general, is moving from the Entry to the Intermediate phase. In the field of Instructional Activity Outcomes the general teaching staff and the computer department teaching staff have completed the Introduction and Entry phases and are moving into the Intermediate Phase 3. Of the subject departments the Mathematics department is moving into the Penultimate Phase 4.

The computer subject department is far ahead of the school In the field of Teacher Interaction Outcomes, as a whole, taking the Graphics department with it into the final Creation phase. The school, as a whole, is found in the Phase 2, Entry. In the General School Outcomes the school is reaching the final Phase 5, Creation. The school, as a whole, could be said to be moving from the Phase 2, Entry, to Phase 3, Intermediate, as tabulated in Table 5.17.

### 3 Conclusion

Chapter 6 will make a final summing up of the project and make recommendations for the further integration of computer-assisted education at the school as well as recommendations for further research.