OECD/CERI ICT PROGRAMME

A Case Study of ICT and School Improvement at
R.K. Basisschool 'De Marke', Losser, The Netherlands

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1. Overview

1.1 School description

R.K. Basisschool 'De Marke' is a catholic school for primary education in a new housing estate of a village (Losser) in the east of The Netherlands. There are several schools for primary education, most of them catholic, in Losser.

The organisation of the school is based on the year group system.

The school has eight classrooms, a classroom for crafts, a playroom for the young children and a computer lab. The technology co-ordinator has a workroom where he can maintain the network, repair the hardware and install the software.

There is a central lobby, which is used for several activities. For students, who stay at school during the lunch break, there are three computers available. They can play games on the computer if they cannot play outside.

The computer lab is fitted with air conditioning and is also used by the Expertise Centre 'De Marke' in the evening for ICT-courses for teachers of other schools and private individuals.

The staff of the schools consists of a principal, fifteen teachers (some of them have a shared job), a remedial teacher, an internal counsellor, and a technology co-ordinator. There are 235 students at this school.

1.2 Educational system

In the Dutch educational system, primary education starts at the age of four and ends at the age of twelve. The first two grades are Kindergarten. When a child has become five years of age, primary education is obligatory. Core objectives have been established for all subject areas and educational fields and cross-curricular core objectives (not related to a specific subject area, e.g., general skills). These core objectives refer to the end of primary education. For children with learning difficulties (related to behaviour), there is special education. The policy of the government is to keep these children in primary education ('Going to School Together'). By catering for a wider range of educational needs, these children can attend lessons in regular education.

After primary education, the students go to secondary education. They start with 'basic secondary education', after this period of two years they continue with pre-vocational secondary education, general secondary education (junior or senior), or with pre-university education.

1.3 School improvement and ICT

The school has integrated the use of ICT in the daily educational practice of the school, from Kindergarten (K1) to grade 6 (age 4 to 11/12) in almost all subject areas. They use many programmes which are included in or part of their textbooks for arithmetic, mother tongue and reading. Next to these programmes, there is educational software. Young children use several programmes in which they had to count objects, read small words and manipulate with colours (educational games). Computers are available throughout the school: in the classrooms and in the computer lab.

The next step is to establish a curriculum that indicates what programmes are used in each grade. There should be a logical structure in the programme, from Kindergarten to grade 6. According to the principal, a teacher knows which textbooks to use in a particular grade but he or she needs also to know what programmes are available. This is necessary because the teachers change every three or four years from class.

Photo 1: Students of grade 6 supervise the youngest students of Kindergarten

In the future, the school in considering to pay attention to the training of basic ICT-skills. At this moment, there is no time available to do this. The students are taught these skills when they need it. Many students have acquired these skills not at school, but e.g., at home. They learn also from their friends and classmates.

The school regards ICT as a tool, not a goal. It is additional to the textbooks they use in the school, as enrichment and as exercise material. It can also bring about communication with others and discovery of the world around you with Internet.

An important requirement of the programmes is that the students are able to use them independently. This is one of the goals of the school that students learn to work independently. Unfortunately, not all programmes are suited for this purpose. The teacher has to put in a great effort to be able to use these programmes. Another requirement is the surplus value of the programmes for the students. Programmes are used to learn not to entertain.

The board of the school will soon finish an ICT-policy document in which several topics related to ICT are discussed which refer to all six school of the board. This will enhance the collaboration between the schools. They can make agreements about hardware and software issues, ICT-personnel, etceteras.

1.4 Profits of improvement

The computer will not replace the teacher. Certain thing can be done better with the help of the computer in a nice way. The students in this school profit from ICT in several ways:

- Some students have problems with the traditional instruction. The computer can offer extra help, another approach to facilitate learning of reading or arithmetic skills.
- Training of certain skills can be done with a computer. It is more fun for the students and can be adapted to the progress the students make.
- Students can compensate weaknesses by using the computer for various tasks.
- At the same time, a number of students with various learning problems can be offered extra practice. Normally, a teacher can help one student at a time.
- Information can be retrieved from the Internet and be exchanged to other students. Students can do projects independently.
- Some students have the possibilities to broaden their knowledge and skills.

The principal notices that the attitude in the school is changing. It has become quite common that students work independently. Teachers have to be more flexible in their organisation.

Teachers can leave the initiative to the students. They can determine when they will do an exercise with the computer. When two students work with one computer, students collaborate, find solutions. The computer stimulates these skills.

1.5 Accomplishments

In this school, ICT is regarded as an enrichment of their educational practices. It provides the school with additional material (programmes). ICT also means additional exercise materials (remedial teaching). But it means also communication with other people, wherever in the world.

For this purpose, each class has access to the computer lab two times a week (about two hours). The lab is suited for group teaching. In each classroom, there are two to four computers available for individual use. All computers are connected to the internal network of the school.

The technology co-ordinator of the school is also the system manager. He teaches no classes. A day per week is available for the other schools of the board. The deputy principal and the technology co-ordinators are both involved in the ICT-matters of the school.

The implementation of the innovation requires more flexibility of the teachers. Group teaching has become less appropriate when some students use a computer individually. When there are technical problems, a teacher needs to change his planning and think of a solution (split his class in two, take another lesson).

1.6 ICT use in the school

Students use various programmes. The programmes are classified per grade. When the students have logged in, they find on the screen the programmes that are available for their grade. Students of the upper grades have their own e-mail address, password and can save their work on the server.

Several programmes are integrated in the textbooks (mother tongue, reading and arithmetic). In Kindergarten, students learn to use the mouse. In grade 3, the students learn to browse the Internet. If they have finished the programme, they get a diploma.

The school has participated in an e-mail project with a school in Germany. Students of grade 6 wrote messages to students. Other classes have also participated in e-mail projects.

Students in the upper grades also use Word and Paint for their projects. They search the Internet for information they can use for a project.

Students are allowed to use the Internet when they have got from their teacher an assignment in which they need to collect information. During lunch break is not permitted to use the Internet or to use a chat programme.

The members of the staff use ICT. They have their own e-mail address. Minutes of meetings are distributed by e-mail, though not everybody is so happy with this development.

The school has a website (http://www.demarke.nl/) with e.g., information for the parents.

1.7 Primary innovations

In the past, the school has not participated in large school-wide innovations. By attending of several courses, the school aims at improving to quality of education.

At this moment, the school is paying extra attention to classroom management. Students need to work more independently because the teachers teach small groups of students or make use of ICT to instruct some students. Several activities take place at the same time. In this way, the school tries to replace the traditional system with a system based on independent working. For this purpose, they attend a course at an Institute for School Counselling.

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2. The Past

2.1 Innovation history

The first computers came through the 'Comenius' project. It was an initiative of the government. The aim was to integrate the computer in education. The school received three computers (one computer for every 60 students). One computer was for the

management of the school, and two for the teachers and students. Therefore, the school looked possibilities to have more computers. Computers that were not used in business anymore were given to the school.

Next, the school participated in several other projects of the government (like 'PRINT'). The school became also one of the 'Vanguard' schools. This gave the school facilities to implement ICT in education. There was a budget for hardware (computers and network), ICT-training of the staff. The school would also be connected to Kennisnet (a national computer network for schools and related organisations, which gives the schools access to the Internet).

The school was asked by the local authority to participate in an e-mail project with a school in Germany. This project enabled the school to buy more computers and a network.

The school also participates in European Network of Innovative Schools (ENIS). Video-conferencing is one of the methods to communicate between schools.

In 1998, the school had been declared 'Computer school of the year' because of the developments that have taken place in the school related to ICT.

2.2 Initiator of the innovation

The respondents regard the technology co-ordinator as the initiator of the innovation. He was enthusiastic to use ICT in school. He was the first who participated in e-mail project.

The management of the school supported his initiatives. By various projects in which ICT was used in different ways he was able to convince his colleagues of the benefits and usefulness of computers.

Now, all teachers agree to use computers and have participated voluntarily in training for the European Computer Driving Licence (ECDL).

The technology co-ordinator who teaches no classes is also the system manager. He maintains the computers and the network. A teacher cannot do these activities in combination with his teaching tasks.

2.3 Supporters of the innovation

The board has supported the school financially. These financial resources enabled the school to expand the ICT-infrastructure. This board has five other schools for primary education. At these schools the developments related to ICT have not been so rapidly. The board has asked the school to help these schools. The technology co-ordinator works one day per week for these schools.

The technology co-ordinators of three schools have drawn up an ICT-policy document for all the schools. This includes (a.o.) the installation of an Intranet for all schools and the purchase of educational software for all schools.

Parents supervise the use of educational programmes in Kindergarten. A class is split up in two groups. Three parents take one group to the computer lab. The other group stays with their teacher. After half an hour, they change.

2.4 Innovation problems

Though the school has many computers, it is a wide variety of computers; many of them are old ones (Intel-386 and -486). The old ones are slow and it takes a long time before a programme has started. Or when they want to do another programme. Students need to wait patiently for the programme to load. Time cannot be just efficiently.

It is problematic when all students are logging on to the network at the beginning of a lesson. It takes several minutes and students have to wait.

Photo 2: For each grade several educational programmes are available

For many programmes a network version is not available yet. Now, the school has to buy a licence for each computer to use the program. If one of those computers is broken, the licence has to be removed first before the programme can be installed on another computer. It has happened several times that the licence got lost. The school had to buy a new one. The educational publishers are not so interested in selling network versions of their software, according to the principal.

Another problem, related to the use of licences is that these programmes are not available in the whole school, but only on a limited number of computers in a classroom. Others classes cannot use these programmes in their classrooms or in the computer lab.

The school has access to the Internet via Kennisnet. The connection with Kennisnet is not reliable. Students complain that it is very slow if there is a connection. It can happen that not all the students of a class get access to the Internet. The principal is not very content with Kennisnet and does not understand what is the surplus value of the network. The school has to pay for the connection, but feels powerless when there is no connection. There are no alternatives for this situation.

Another problem, related to the use of computers is the available room in a classroom. The classrooms have been built according to then minimal requirements. Also furniture is needed. The tables in a school are too small and not suited for a computer and a monitor.

The use of many computers causes a rise in the costs of power. The school does not receive a budget for these costs.

The school uses ICT very frequently. The network and the computers are vulnerable. A teacher is helpless when the system does not function. The maintenance is important. The costs of a system manager would take up too much of the budget, while the budget is needed to buy (replace the old) computers and educational programmes.

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3. The Present

3.1 Diffusion patterns

The technology co-ordinator initiated the computer activities in the school. He convinced his colleagues to use computers in their lessons. It has taken some time, but now everybody approves of the use of ICT. At this moment, the members of the staff have accepted the innovation. They want to know more about ICT to be able to use ICT in their lessons at an adequate way. Their voluntary participation in training for the European Computer Driving Licence proves that they regard ICT as useful in their

teaching practice.

According to the principal, in the beginning the use of computers depends largely on the enthusiasm of one or two teachers. They invest a lot of their leisure time to develop and experiment. It is partly hobbyism. But it show that they are involved, they have their heart in this matter.

The internal counsellor looks at the educational aspects of programmes (Does it fit with the ICT-policy of the school?), while the technology co-ordinator looks at the technical aspects (Can the software be used in a network?).

There is a working group of teachers with interest in ICT from the six schools of the board, which discuss the purchase of new programmes. The school has two delegates in this working group. It is part of their tasks in the school. No longer it is accepted that they can do this in their leisure time. In combination with their teaching tasks, it would be too much.

In the ICT-policy document of the board attention has paid to organisational aspects of the innovation (What are the tasks? Who is responsible?). In a structured way, the innovation is transferred to all (other) schools of the board.

3.2 Staff development and involvement

The technology co-ordinator has organised courses for the members of the staff. He teaches those elements of the European Computer Driving Licence, which are relevant for teachers: like Windows and Word. Next school year he will teach the use of e-mail and the Internet. Teachers who are interested in the other parts of the European Computer Driving Licence have to study these parts themselves.

The ICT-policy document has indicated that these elements of the European Computer Driving Licence are the minimum. According to this document, all schools need to have a plan for refresher courses in order to attain that teachers have sufficient knowledge of operating systems, educational programmes, word-processing and other application which are used frequently.

The technology co-ordinator also organises ICT-instruction sessions in the afternoons in the computer lab. In these sessions he explains how the teachers have to use the network. Teachers can get familiar with the programmes for their classes and learn how to receive and send e-mail and how to use the Internet. Teachers have to use ICT independently. These sessions are also used to discuss ICT-related topics, e.g., how do we use the Internet in our teaching practice?

The teachers are using ICT more frequently. The minutes of the staff meeting are not hand-written anymore. They use the word-processor and distribute the minutes by e-mail. All teachers have an e-mail address. They can receive and send e-mail at home.

The technology co-ordinator has attended several courses, which are related to his tasks. To be able to manage the network and the ICT-related problems, he needs to be well informed. Otherwise, he has to solve the problems by trial and error.

3.3 Role of leadership

The principal of the school is aware that when one or two teachers are very enthusiastic and want to realise several things in a short time, there is danger that it will split up the team. It is sometimes necessary to slow down the developments and question whether it is interest of some teachers or should it be part of the ICT-policy of the school. He has to take care that all members of the staff agree with the developments and can keep up with the changes.

The principal teaches no classes. When he did, he could not pay enough attention to his students. Many people outside the school contact him for information. Now, he can take time for these activities.

At this moment, the necessity to look for projects, which bring in money, or participate in competitions or prize contests, is not present anymore. According to the principal, it is important now to set up a clear structure of how ICT will be used in the school.

3.4 ICT-innovation Connections

The school is aware of its position with regard to ICT in comparison with the other schools of the board. Therefore, the board has asked the school to help the other schools. These schools received a network server and the infrastructure was constructed.

The six schools of the board have drawn up an ICT-policy document in which joint agreements are how ICT will develop in the coming years in these schools and how these school can collaborate in the field of ICT.

The principal intends to investigate how his school can collaborate with the other schools for primary education in Losser. There are twelve schools. He also wants to involve the civil servants of the local authority who have ICT in their portfolio. According to the principal, they have a lot of knowledge that can be used by the schools.

The school is one of the twelve schools in The Netherlands which participated in the European Network of Innovative Schools

project. The aim of the project is to set up international projects, which can be an example to other schools. One of these projects is an international video-conferencing project.

3.5 ICT infrastructure

At this moment, the school has ninety computers in all, most of them are Pentium-computers, of which thirty-five are multimedia computers (equipped with a soundcard and a CD-ROM drive). All computers are connected to the network of the school. The school has an UTP-network. In the computer lab there are twenty-three (multimedia) computers available. The other computers are located in the classrooms (two to four computers) and in the lobbies. All classrooms are connected to the Internet.

Photo 3: Parents supervise in the young students in the computer lab

There are five printers and two scanners available in the school. The school has several servers, one of them is used for backups. In the computer lab a video-projector is available.

Because there is little room for the computers in the classroom, the school has constructed a mezzanine level in one of the classrooms which gives room for four computers. This level can be reached from the classroom. The school intends to construct in all classrooms such a mezzanine level.

The school has bough a lot of equipment, but also received computers, which have been replaced elsewhere. The variety of computers with different configurations makes it difficult for the technology co-ordinator to install programmes on these computers. He gives technical support to teachers and organises ICT-training for teachers too. He also gives technical support at other schools of the board (one day per week); problems are solved immediately.

3.6 Effectiveness

The teachers report that the students have become more independent when they use ICT. They are motivated to use a programme, as we have observed in the computer lab. Motivation is one of the main reasons for the teachers to use ICT in their teaching practice. In the e-mail project with a school in Germany, students wrote more frequently and made longer letter if they were allowed to send it by e-mail, or ask to finish the letter at home

From the point of view of the school, ICT is regarded as additional. For some skills like the multiplication tables, the students use

the computer to practice these skills independently.

Students, who need extra help, use the computer to practice, especially with reading, mother tongue and arithmetic. The teachers have noticed positive effects, though it depends partially on the quality of the programmes. The school uses also programmes that are closely related to the textbooks. It stimulates the students by practising in a different way. Students who have problems with writing (motor skills) benefit from the use of the computer.

Project work looks better. Students use a word processor instead of a pen and paper. Errors can be corrected easily.

3.7 Academic rigour

The school has integrated the use of computers in the subject areas. There is not a separate subject 'information technology' on the timetable. The use textbook-related programmes strengthen integration of computers in subject areas. ICT is part of the textbook and gives the students other possibilities to practices. The availability of computers in the classroom makes it easy for the teacher and the students to integrate the use of the computer.

The principal states that the teachers have to change their organisation when they want to integrate ICT in education and pay attention to their students with different abilities. This way of organisation has to be the same in all grades. Students, who have learnt to work independently in the lower grades, should also be able to apply these skills in the upper grades. It is for a teacher difficult to say that he or she will not make use of ICT in his or her class. When the school started with computers, this could happen, but now, all teachers support the innovation.

3.8 Equity

The respondents have not noticed relevant differences between girls and boys concerning the use of ICT. There might be differences in their way of learning, both are enthusiastic to use the computer.

Many students have a computer at home, sometimes a newer one than in school, with more facilities. These students will learn quickly how to use an educational programme. But those who have not a computer at home can get enough practice at school to acquire the basic ICT-skills. However, differences in skills will not disappear, but will exist.

The weaker students get extra attention in the school. The computer can help them with their learning problems. ICT appears to be a useful tool to help these students.

3.9 Sustainability

The technical support of the computers and the network is the responsibility of the technology co-ordinator. The functioning of the ICT-infrastructure depends on his expertise. He teaches no classes to be able to carry out his tasks. A weak point is, according the one of the teachers, that it is not known whether and for how many hours he will be available for the school. At this moment he is working at other schools too. It depends how the board will organise the support for their schools.

ICT is integrated in the school. A (new) teacher cannot allow him- or herself to ignore the computers in a school year. The students are acquainted with the use of ICT in education and expect this way of learning. The teacher who will have that class next year expects that the students acquired new skills. Both teachers and students are stimulating each other to use the computer. It has become part of their daily educational practice.

3.10 Scalability

In the ICT-policy document, the method of working of this school has been taken as a starting point. The method will be copied to the other schools. The ICT-infrastructure will be basically the same. It is not limited to these schools, in other schools for primary education this method of working can be applied. Most important is the attitude of the teachers. If they do not see what ICT can contribute to their teaching, then the innovation will fail.

But if they have a positive attitude towards ICT in education, then the training of the basic ICT-skills is a requirement. Just as the school needs a budget to buy computers, peripherals and educational programmes, the school needs someone to maintain the ICT-infrastructure.

3.11 Results of the Teachers ICT Practices Survey

The Teachers ICT Practices Survey was given to all teachers. Only three forms have been returned (all female teachers of the lower grades (including Kindergarten). Tables with the results are presented in Appendix A.

The three teachers feel (very) comfortable using a computer for writing a paper, searching for information on the World Wide Web, sending and receiving e-mail and drawing a picture or diagram. The do not feel comfortable at all when they create and maintain a web page, use a programming language or present information with PowerPoint.

During the past school years, the students of these teachers of the lower grades have used a computer to play games and have used an instructional programme several times each month or week. The students have never used the computer for creating web pages, using a spreadsheet, joining in on a on-line forum or chat room or using a presentation programme. The use of the computer for the World Wide Web, a word-processing programme, or a graphics programme varies from 'never' to 'several times each month' in these classes.

Two of the teachers rate their ability to use a computer as 'fair', one teacher says 'good'.

In the last school year student computer use was not evaluated for grading. The teachers have not modified a website with any of their classes.

Most of the computer use in their classes was directly related to the course content, according to two teachers (one says 'all computer use'. The students did most of the computer use that they assigned individually. If they assign searching on the World Wide Web, they give some restrictions.

The use of the computer at home for preparing their teaching varies from 'never' to 'several times each week'. The teachers have not participated in a virtual course through the Internet, have not involved their students in collaborative learning over the Internet and have not used technology to collaborate with other teachers.

Photo 4: Students of grade 6 use the Internet to communicate with another school

Two teachers do not send e-mail messages, one teacher sends one to five messages on average each day.

The three teachers have never made changes to a computer's hardware, created a website and developed a database. One teacher has ever updated an application programme and recovered a damaged file.

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4. Main hypotheses

4.1 Technology is a strong catalyst for educational innovation and improvement

All grades in this school use various educational programmes, some of them are related to the textbooks (see section 1.1). The upper grades us the Internet and e-mail (see section 1.5). ICT is regarded in this school as additional, not as a replacement (see section 1.3 and 3.6). It offers extra help to students who need it (see section 3.8).

To realise this innovation, computers are available in the classrooms and in a computer lab (see section 3.5).

Though the number of computers in this school is impressive and the ICT-infrastructure is at a high level, supported by a technology co-ordinator, the hypothesis needs to be rejected in favour of the rival hypothesis. The integrated use of ICT is in itself innovative and has improved the quality of education in the school. But the educational practice has not changed so much yet. The use of computers in the school has not lead to the introduction of new educational practices, e.g., in which the students are more responsible for their own learning, take the initiative to shape their learning environment and in which the teacher has more the role of the supervisor and less the role of instructor. It is not inconceivable that the school, or the upper grades, will develop towards this direction in the future.

4.2 The diffusion followed the traditional diffusion pattern for innovations

The technology co-ordinator introduced ICT in the school. The management of the school supported him. He was able to convince his colleagues of the benefits and usefulness of computers (see section 2.2).

At this moment all teachers use ICT in their educational practice. ICT has become integrated in nearly all subject areas (see section 3.9).

It must be concluded that the hypothesis cannot be rejected. In this small group, the traditional diffusion pattern is clearly visible.

4.3 Successful implementation of ICT depends mostly upon staff competence

The school has paid, and still pays, attention to the staff development. The technology co-ordinator organises courses to learn the basic ICT-skills, like Windows, Word, the Internet and e-mail. These are elements of the European Computer Driving Licence, which are relevant for the teachers. He also organises ICT-instruction afternoons. In these sessions the focus is more on the educational programmes (see section 3.2).

The teachers are competent to use ICT, and their competency will increase further because staff development activities will continue.

On the basis of these findings, it must be concluded that the hypothesis can be accepted.

4.4 Gaps in academic performance between high and low poverty students will not increase

Students, who do not have a computer at home or do not have access to the Internet, get sufficient possibilities to acquire the basic ICT-skills. The gap in basic ICT-skills between students who have a computer at home and those who do not have one, will not increase (see section 3.8).

The school uses ICT as a possibility to offer extra help to the weaker students. The programmes motivate the students to practice subject matter, which is problematic to them. Teachers experience positive effects (see section 3.6). The gap in academic performance will not increase and possibly decrease.

The hypothesis cannot be rejected. There is no evidence that weaker students profit less from the use of ICT.

4.5 Successful implementation of ICT will lead to the same or higher academic standards

The students of the upper grades, especially grade 5 and 6, use the Internet for their project work. In all grades educational programmes are used for most of the subject areas (see section 1.5). The quality of the programmes is checked by the technology co-ordinator (technical aspects) and by the internal counsellor (educational aspects). The school wants to prevent that programmes are used that do not function well on the computers and/or are not useful for the students (see section 3.1).

It must be concluded that the hypothesis can be accepted. The school watches carefully what is done in the field of ICT to make the implementation of ICT successful and how ICT can be applied to improve the quality of primary education.

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5. Projection to the future

5.1 Sustainability

ICT has become integrated in the daily educational practice of all teachers and students. It is expected that teachers use ICT. However, there can be individual differences and preferences. It has become completely normal to use ICT.

The question of sustainability of the innovation has become almost redundant in this school. More important is the question in which direction the innovation will develop or has the development reach his final stage.

More troublesome are the problems with the old computers and the access to the Internet (via Kennisnet).

A major threat to the sustainability of the innovation is the fact that the technology co-ordinator has all the technical expertise in the school. The ICT-infrastructure has become so complex, that the school cannot do without a system manager.

5.2 Scalability

This innovation is not so complicated to implement in other schools. A school can have a comparable ICT-infrastructure, maybe with fewer computers. To keep everything running, a system manager is needed to maintain the computers and the network.

Teachers should have a clear vision of what they want to realise with the use of ICT and have a positive attitude toward ICT in education. Training will also be necessary, basic ICT-skills and experience with the educational programmes.

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Appendix A: Tables for Teacher ICT Practices Survey

Gender of the respondents

		Count	Col %
Gender teacher	female	3	100,0%
	male	0	,0%
	not answered	0	,0%
Group Total		0	100,0%

How comfortable are you with using a computer to do each of the following?

	Create and maintain web pages		Write a paper		Search for information on the World Wide Web	
	Count	%	Count	%	Count	%
not at all comfortable	3	100,0%	0	,0%	0	,0%
somewhat comfortable	0	,0%	1	33,3%	0	,0%
comfortable	0	,0%	1	33,3%	3	100,0%
very comfortable	0	,0%	1	33,3%	0	,0%
Total	3	100,0%	3	100,0%	3	100,0%

How comfortable are you with using a computer to do each of the following? (continued)

	Use a data base		Send and receive e-mail		Programming (i.e., use a programming language)	
	Count	%	Count	%	Count	%
not at all comfortable	1	50,0%	0	,0%	3	100,0%
somewhat comfortable	0	,0%	1	33,3%	0	,0%
comfortable	0	,0%	1	33,3%	0	,0%
very comfortable	1	50,0%	1	33,3%	0	,0%
Total	2	100,0%	3	100,0%	3	100,0%

How comfortable are you with using a computer to do each of the following? (continued)

	Draw a picture or diagram		Present information (e.g., use PowerPoint)	
	Count	%	Count	%
not at all comfortable	0	,0%	3	100,0%
somewhat comfortable	1	33,3%	0	,0%
comfortable	2	66,7%	0	,0%
very comfortable	0	,0%	0	,0%
Total	3	100,0%	3	100,0%

During the past school year, how often did your students on average do the following?

	Use the World Wide Web		Create web pages		Send or receive e-mail	
	Count	%	Count	%	Count	%
never	1	33,3%	3	100,0%	1	33,3%
a few times	1	33,3%	0	,0%	2	66,7%
several times each month	1	33,3%	0	,0%	0	,0%
several times each week	0	,0%	0	,0%	0	,0%
Total	3	100,0%	3	100,0%	3	100,0%

During the past school year, how often did your students on average do the following? (continued)

	Use a word processing program		Use a computer to play games		Use a spreadsheet	
	Count	%	Count	%	Count	%
never	1	33,3%	1	33,3%	2	66,7%
a few times	1	33,3%	0	,0%	0	,0%
several times each month	1	33,3%	2	66,7%	1	33,3%
several times each week	0	,0%	0	,0%	0	,0%
Total	3	100,0%	3	100,0%	3	100,0%

During the past school year, how often did your students on average do the following? (continued)

	Use a graphics program		Join in an on-line forum or chat room		Use a presentation program (e.g., PowerPoint)	
	Count	%	Count	%	Count	%
never	1	33,3%	3	100,0%	3	100,0%
a few times	1	33,3%	0	,0%	0	,0%
several times each month	1	33,3%	0	,0%	0	,0%
several times each week	0	,0%	0	,0%	0	,0%
Total	3	100,0%	3	100,0%	3	100,0%

During the past school year, how often did your students on average do the following? (continued)

	Use an instructional program (including simulations)		Other computer uses	
	Count	%	Count	%
never	0	,0%	0	,0%
a few times	1	33,3%	0	,0%
several times each month	0	,0%	0	,0%
several times each week	2	66,7%	1	100,0%
Total	3	100,0%	1	100,0%

Rating the ability to use a computer

		Count	Col %
	poor	0	,0%
How would you rate your ability to use a computer?	fair	2	66,7%
	good	1	33,3%
Group Total		3	100,0%

Based on experiences or polices from the last school year

	Was student computer use ever evaluated for grading?		Did you create or modify a Web site with any of your classes you taught?	
	Count	%	Count	%
no	3	100,0%	2	100,0%
yes	0	,0%	0	,0%
Total	3	100,0%	2	100,0%

Based on experiences or polices from the last school year (continued)

	What portion of the computer use in your classes was directly related to the course content?		What portion of the computer use that you assigned was done by students individually?	
	Count	%	Count	%
very little	0	,0%	0	,0%
some	0	,0%	0	,0%
most	2	66,7%	2	100,0%
all	1	33,3%	0	,0%
Total	3	100,0%	2	100,0%

Based on experiences or polices from the last school year (continued)

	If you assigned World Wide Web searching, how much freedom did you allow?	
	Count	%
designated sites only	0	,0%

some restrictions	2	100,0%
no restrictions	0	,0%
Total	2	100,0%

Based on experiences or polices from the last school year (continued)

	How often did you use a computer at home for preparing for teaching?	
	Count	%
never	1	33,3%
a few times	1	33,3%
several times each month	0	,0%
several times each week	1	33,3%
Total	3	100,0%

Based on experiences or polices from the last school year (continued)

	Did you participate as a student or instructor in a virtual course through the Internet?		Did you involve your students in collaborative learning over the Internet?	
	Count	%	Count	%
no	3	100,0%	3	100,0%
yes	0	,0%	0	,0%
Total	3	100,0%	3	100,0%

Using technology to collaborate

		Count	Col %
Are you using technology to collaborate with other teachers?	no	3	100,0%
	yes	0	,0%
Group Total		3	100,0%

Sending e-mails each day on average

		Count	Col %
How many e-mail messages total do you send each day on average?	none	2	66,7%
	1-5	1	33,3%
	6-11	0	,0%
	more than 12	0	,0%
Group Total		3	100,0%

Have you ever done the following?

	Made changes to a computer's hardware		Updated an application program (word processor, graphics program)		Recovered a damaged file	
	Count	%	Count	%	Count	%
no	3	100,0%	2	66,7%	2	66,7%
yes	0	,0%	1	33,3%	1	33,3%
Total	3	100,0%	3	100,0%	3	100,0%

Have you ever done the following? (continued)

	Created a web site		Developed a data base	
	Count	%	Count	%
no	3	100,0%	3	100,0%
yes	0	,0%	0	,0%
Total	3	100,0%	3	100,0%

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Appendix B: Other supporting evidence

- There are 90 computers available for 325 students (student : computer ratio = 3.6).
- The educational staff of the school consists of a principal, 15 teachers (some of them have a shared job), a remedial teacher, an internal counsellor, and a technology co-ordinator.
- All classrooms (from Kindergarten to grade 6) and the computer lab are connected to the internal network of the school and have access to the Internet.

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Appendix C: Documents

- R.K. Basisschool 'De Marke', (2000), Schoolgids 2000-2001 (School Guide), Losser.
- Werkgroep Beleidsplan ICT, (2001), Beleidsplan ICT 2000-2003 van Stichting Katholiek Onderwijs Losser en Overdinkel (ICT-Policy document), Losser.
- Voogt, J.M. & Odenthal, L.E., (1999), Met het oog op de toekomst. Een studie naar innovatief gebruik van ICT in het onderwijs (Portraits of Emergent Practices), Enschede.
- Website R.K. Basisschool 'De Marke': http://www.marke.nl/.
- Bezoekschema Computerlokaal 2000-2001 (Schedule Computer lab).
- Tellijst computers en randapparatuur SKOLO Losser (Number of computers and peripherals).

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