OECD/CERI ICT PROGRAMME

Case Studies of ICT and School Improvement in The Netherlands

Executive Summary

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1. Introduction

Within the framework of the ICT-Programme 'ICT and the Quality of Learning' of the Centre for Educational Research and Innovation (CERI) of the Organisation for Economic Co-operation and Development (OECD), initiated in 1998, The Netherlands has participated in the component 'Case Studies of Organisational Change' of the area 'Research and Evaluation of the Impact of ICT on Schooling and Learning'.

In the period October, 2000 until March, 2001, four case studies have been carried out in Dutch schools for primary and secondary education by researchers of the Department of Curriculum (Faculty of Educational Science and Technology) of the University of Twente (Enschede, The Netherlands). Team Leader is Gerard Doornekamp.

The Workbook for Case Studies of Organisational Change (version 9b; August, 2000) describes the study goals, the hypotheses and the design of the case studies. The study is co-ordinated by the University of Delaware (USA).

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2. Schools

2.1 Description of the schools

In this study, two schools for primary education have participated: Basisschool 'De Verrekijker' (Amstenrade; code NL01) and R.K. Basisschool 'De Marke' (Losser; code NL02). Both schools work according to the traditional year group system. About 320 students (Kindergarten to grade 6) visit these schools.

Two schools for secondary education have given their assistance to this study: Jacobus College (Enschede; code NL03) and Agricultural Training Centre Oost (Twello; code NL04). The first school is a school for general secondary education (about 1.100 students), while the second is a school for vocational education (about 700 students), including pre-vocational secondary education and senior secondary vocational education. Both schools have several locations.

Two of these schools (NL01 and NL03) were selected through the SITES M2 Case Selection procedure. The innovations in these schools can be characterised as school-wide innovations. Two other schools, also from the SITES M2 Case Selection, could not participate because in one case no appointed could be made before March 1, 2001 and in the other case the teacher became ill. Therefore, two other case study schools had to be found as soon as possible because time was running short; an extended case selection would take too much time. >From the schools we know and have contact with, two schools were selected (NL02 and NL04). These schools are good replacements for the schools that were selected initially. The innovations are in line with the starting points of the OECD Case Studies. These schools are included in the SITES M2 Case Studies too.

2.2 ICT in the schools

The four schools are all 'Vanguard schools'. Within the policy of the government to integrate ICT in education, the government started the 'Vanguard schools' project. The schools received a budget for the ICT-infrastructure and staff development. Next, they are connected to the Internet via Kennisnet (i.e., a national computer network for schools and related organisations).

The schools have invested a lot of money in the ICT-infrastructure of the school. Nearly all computers are connected to the internal network of the school. Many computers are multimedia computers (i.e., equipped with a CD-ROM and a sound card). Table 1 shows the student : computer ratios of these schools.

Table 1: Student : computer ratios

Basisschool 'De Verrekijker' (Amstenrade)	9.4
R.K. Basisschool 'De Marke' (Losser)	3.6
Jacobus College (Enschede, location Van der Waalslaan)	12.2
Agricultural Training Centre Oost (location Twello)	15.0

In the schools for primary education less students need to share a computer than in the schools for secondary education.

For each respondent of the ICT Practice Survey for Teachers indices have been calculated for how comfortable the teachers are using ICT ('Comfort') and for the use of ICT in students' assignments ('Assignments'). Table 2 presents the number of teachers, the mean index and the standard error of the mean per school for each index.

Jacobus College and ATC Oost have higher mean scores on the 'Comfort' index than the two schools for primary education. The mean score on the 'Assignments' index of ATC Oost is higher than the mean score of the other schools. The teachers of the ATC Oost assign more ICT-related activities.

Table 2: Mean indices

	Comfort			Assignments		
	N	M	s.e.	N	M	s.e.

Basisschool 'De Verrekijker' (Amstenrade)	13	2.5	0.1	12	1.7	0.1
R.K. Basisschool 'De Marke' (Losser)	2	2.3	0.4	3	1.8	0.3
Jacobus College (Enschede, location Van der Waalslaan)	4	2.6	0.4	4	1.6	0.3
Agricultural Training Centre Oost (location Twello)	3	2.6	0.2	4	2.4	0.3

The two schools for primary education have a full-time technology co-ordinator. The co-ordinator is also the system manager (he teaches no classes). The schools for secondary education have a system manager, but he works also for the other locations of the school.

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3. School improvement and ICT

3.1 Innovation in school

These four school use ICT in different ways to innovate their teaching / learning process. A short description of the innovation at each school is given below.

At Basisschool 'De Verrekijker', students of the upper grades (i.e., grades 3 to 6) have learnt the ICT basic skills to design and publish their web pages on the Intranet of the school. With these skills they have made their home page and additional web pages. In the future, the students will do projects and they will publish the reports on their website. The students work independently in the common lobby of the school, supervised by their teacher during one hour per week.

R.K. Basisschool 'De Marke' has integrated the use of ICT in their daily educational practice, from Kindergarten to grade 6. The school has a wide variety of educational programmes, many of them are related to the textbooks they use. These programmes are used as additional: extra help or extra practice for those students who need it, but also to broaden their knowledge and skills. Computers are available in the classrooms (two to four) and in the computer lab.

Jacobus College has initiated the project 'School 2000', which is an innovation project for the lower grades of secondary education (i.e., grades 7 to 9). Within the framework of this project, several teachers have developed projects; some of them use ICT in these projects (e.g., the Whitbread Race project). Students work independently and are supervised by an educational assistant. With this project, the school wants to innovate the teaching practice and to release time for teachers by decreasing the number of their lessons.

The ICT-policy of Agricultural Training Centre Oost (ATC Oost) is aimed at offering twenty percent of the attainment targets by using ICT and reducing the number of contact hours in the department senior secondary vocational education. With the programme 'Learning Space' teachers have developed an electronic learning environment for the subject area 'managing animal husbandry'. Students can learn independent of time and place. In

small groups, they collaborate with groups of students from other locations of ATC Oost.

3.2 Initiator of the innovation

At both schools for primary education, the technology co-ordinators are the initiators of the innovation. When they had their class, they developed materials or used programmes. Their students used these materials and programmes. Their activities convinced the principals of the school and the other members of the staff. The innovation was accepted by all. There were not real resistors to their initiatives, but some of teachers hesitated in the beginning.

The management of the school is the initiator of the innovations in secondary education. The deputy principal of ATC Oost and the project manager of the project 'School 2000' are directly involved. They asked teachers who are interested in and enthusiastic about the use of ICT in education to participate in a project. Other teachers are informed about their activities.

3.3 Effectiveness

In all four case studies the students have acquired the competencies they need in the innovation: they work independently, collaborate with other students, work in groups, plan their activities. Students are motivated to use ICT. Teachers have become supervisors, next to their traditional roles.

Effects, in term of improved results, have not been established yet. Probably, because in some of the case studies the innovation has not been completed yet. The schools are still in a process of developing and adapting the innovation. Once it is institutionalised, (positive) effects can be expected.

3.4 Innovation problems

In three case studies, problems with Kennisnet have been reported. It happens frequently that the connection is broken during the lessons. Two schools, the problems impede the use of ICT. In the fourth case study, a DHCP-server was used to avoid these problems.

Sometimes, students have to wait until a computer is available or have to work in pairs because there are not enough computers. It also can happen that a computer is broken. Old computer cause several problems.

Schools need a full-time system manager: the number have computers has increased and the network is rather complicated. Schools experience problems when he is not available.

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4. Hypotheses

In the Workbook, five hypotheses are described and explained. Table 3 gives an overview whether these hypotheses have been accepted or rejected (in

favour of the rival hypotheses) in each case study.

Table 3: Hypotheses

	NL01	NL02	NL03	NL04
0. Technology is a strong catalyst for educational innovation and improvement	Accept	Reject	Reject	Accept
● The diffusion followed the traditional diffusion pattern for innovations	Accept	Accept	Accept	Accept
● Successful implementation depends mostly upon staff competence	-	Accept	Accept	Accept
● Gaps in academic performance between high and low poverty students will not increase	Accept	Accept	Accept	Accept
● Successful implementation of ICT will lead to the same or higher academic standards	Accept	Accept	Accept	Accept

Table 3 show that in all case studies at least four hypotheses have been accepted. When we look at each hypothesis separately, we are able to draw some conclusions.

1. For two case studies, the first hypothesis has been rejected. In the report on the case study of R.K. Basisschool 'De Marke' it has been concluded that the use of ICT is integrated completely. However, this use has not lead to an innovation of the educational practice. It is in most classes rather a traditional use of ICT. ICT is used additionally, and not as a replacement. This hypothesis had to be rejected for Jacobus College because the technical problems. The developers of the 'Whitbread Race' project make less use of ICT because of these problems. Integration of more ICT in this project (assignments and assessment by ICT) would make the project less traditional. The organisation (supervision by educational assistants) is the most innovative aspect of the project 'School 2000'.

2. Hypothesis 2 has been accepted in all case studies. An initiator develops its ideas and diffuses them to colleagues who are interested. Acceptance follows in due time.

3. It was not possible to decide whether this hypothesis has to be accepted of reject for Basisschool 'De Verrekijker'. The teachers are competent to use ICT. Much attention has been paid to staff development. But at this moment there is no evidence available how the teachers have contributed to the development of the innovation. They have implemented the innovation, but have not yet developed materials and lessons for the students how they have to set up a project.

4. Schools experience differences in ICT-skills of their students. Students who have a computer and a connection to the Internet at home are in a favourable position. It is a small group of students who do not have access at home. They can use the computers at home. At this moment, in this stage of the innovation, no convincing evidence is present that indicates that the gap has increased, or will increase.

5. In the four case studies, no evidence was found that the implementation has lead to lower academic standards. Maybe because the schools do no make so much use of the Internet as a source of information. They have selected the websites with relevant information. R.K. Basisschool uses ICT to improve the quality of their educational practice. At Basisschool 'De Verrekijker' ICT has s strong relation with earlier innovations to improve their teaching.

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