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ÉCONOMIQUES

ICT in Initial Teacher Training

The Netherlands

Country report

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Abstract

Introduction

As part of the OECD [New Millennium Learners](#) (NML) project, CERI (Centre for Educational Research and Innovation) initiated the *ICT in Initial Teacher Training* study. The objectives of the study are:

- To provide a detailed picture of how technology is used in initial teacher training from a comparative perspective.
- To analyse the views of the main stakeholders regarding the present and future use of technology in initial teacher training.
- To issue a number of policy recommendations for both teacher training institutes and governments in this domain.

This report gives the results of the Dutch situation.

Methodology

The overall methodology in the *ICT in initial teacher training* study combines the techniques of a survey approach and case studies. In addition to the research findings, background information is included about the Dutch educational system and its policies.

Survey

Kennisnet¹, in close cooperation with the INHolland Centre² for eLearning, conducted online research on the use of ICT facilities in Dutch higher educational institutes for pre-higher education. Four focal groups have been assessed by using various questionnaires: management, teacher trainers, student teachers and mentor teachers.

The questionnaires were completed in September and October 2009. Table 1 contains the overview of the number of respondents per questionnaire.

Table 1: Overview of respondents

Questionnaire	Total numbers	Responses	Responses in %
A Management	54	39 ³	82
B Teacher trainers	181	108	60
C Student teachers	155	87	49

¹ The Kennisnet Foundation is the public knowledge centre and ICT support organisation for primary, secondary and vocational education in the Netherlands.

² A scientific and research unit chaired by a professor at INHolland University of Applied Sciences.

³ The management of several institutions received more than one questionnaire, but some decided to fill in only one.

D Mentor teachers	102	59	56
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Case studies

Two case studies were conducted for the in-depth survey: the first on 28 September 2009 at INHolland School of Education, Rotterdam; the second on 16 November 2009 at Hogeschool Edith Stein in Hengelo. In line with the context of an educational institute the case studies answer the following question: “How do educational studies prepare teachers for their profession and in what way does ICT play a role in this?” Various sources will provide the elementary factors in finding the answer.

Prior to the survey, the institutions visited were asked to submit a number of policy documents which outline the education and the role of ICT. Group interviews were then held with various levels at the educational institutes: management, teacher trainers, student teachers and mentor teachers, based upon a study of the policy documents and a ‘sample questionnaire’ from the OECD (Organisation for Economic Cooperation and Development).

National framework and policies

The Education System

One of the key features of the Dutch education system is freedom of education i.e. freedom to found schools (freedom of establishment), to organise the teaching in schools (freedom of organisation of teaching), and to determine the principles on which schools are based (freedom of conviction). People have the right to found schools based on religious, ideological or educational beliefs in addition to public schools. As a result of this statutory equality of public and private schools, the education system includes a wide variety of types of school.

The government regulates by law the attainment targets that students in primary and secondary education should achieve. Secondary education is rounded off with central examinations. There is no national curriculum; both the structure and the content of school curricula are the responsibility of the schools themselves.

Children must attend school from their fifth birthday onwards, but nearly all children do so from the age of four. Compulsory full-time school attendance takes twelve years, followed by at least another year of part-time attendance, combined with practical training. Nearly all students aged 17-18 go on to further education.

Initial teacher training courses for the various types of school are part of higher education, some being provided at institutes of higher professional education (HBO) and some at universities. Recently, the role of schools has been growing in importance in teacher training.

Current policies

The Dutch national education policy for 2007-2011 consists of policy plans that have been formulated together with sectoral organisations. Recent reforms and general policy priorities in Dutch education are described below.

Curriculum reforms

It was agreed at national level that schools need to modify their curricula, due to a changing student population. New curricula should devote attention to objectives like citizenship and social integration, as well as increase the focus on the Dutch language and arithmetic/mathematics. Any shortcomings in the rather vaguely formulated attainment targets in the Dutch language and arithmetic/mathematics will be supplemented with so-called points of reference. Schools are also asked to develop excellence programmes for students with high potential.

Institutional reforms

Since 2007 education policy has been the product of a process of increased collaboration within the field of education by involvement of organisations representing the education sectors. The national government makes policy and budget agreements with these organisations in accordance with the sectoral policy plans that have been formulated. Sectoral organisations also take the lead in proposing innovative initiatives to reform education in the Netherlands.

Reforms affecting teachers

Due to the increasing shortage of teachers in primary and secondary education in the past few years, the Minister of Education signed a 'Teacher of the Netherlands' covenant in 2008. This covenant proposes measures to improve both working conditions and the remuneration of teachers. More services are being offered to assist the further professional development of teachers in accordance with 21st-century skills, which will be supported by public ICT organisations and pedagogical centres. Furthermore, more training programmes are being offered to university graduates working in various domains (outside schools), to attract more people to the teaching profession.

Priorities

The first priority of the current educational policy is to find and employ skilled teachers. The need is both quantitative and qualitative. To this end, several policy measures have been introduced to solve this problem (as indicated above).

The second priority refers to the formulation of measures for tailoring education in line with the student's personal ability, social network and interests. Teaching programmes that use ICT to strengthen tailored education have been developed and promoted by several institutes. The Ministry of Education facilitates open learning resources (e.g. Wikiwijs) to help teachers develop digital learning materials for students with differing educational talents and needs. To assist the teacher to achieve individual learning models, a virtual learning community of teachers has been built (Leraar24), which facilitates the exchange of ideas and experiences between teachers.

Thirdly, the Ministry of Education finances extra programmes and activities for both weak and excellent students. A recent OECD report shows that Dutch education is serving the regular student well but is proving inadequate for students at the bottom *and* at the top of educational achievement. Accordingly, new additional programmes focus on more language and mathematics lessons (serving weak students) and excellence programmes (serving top talents).

Last but not least, the government stimulates the innovative capacity of the educational field by introducing tenders for innovative projects. Schools may submit an innovative proposal to solve key educational challenges, such as 'finding skilled teachers' or 'stimulating ICT use in education'.

ICT policies

Schools are themselves responsible for the implementation of ICT in education. National support activities have been set up to stimulate the integration of ICT into the curriculum. These activities consist of projects, programmes and learning communities conducted by organisations that provide the necessary support to meet the existing needs of schools, such as the Kennisnet Foundation (for primary, secondary and vocational education) and the Surf Foundation (for higher education). Furthermore, it is the responsibility of the schools to design a vision, mission and strategy around the implementation and use of ICT in schools. The sectoral organisations are playing an increasing role in assisting managers and teachers to formulate their ICT vision and policy. Some sectoral organisations in secondary education and vocational education have been building up service communities and innovation platforms to this end.

Developments in ICT policy have evolved into a strategic approach to ICT as a means of stimulating and supporting the learning process. This instrumental approach is aimed at understanding the effects of ICT in relation to its pedagogical use. Currently, a great deal of attention is being directed towards the integrated use of ICT in the processes for both learning and administration. The character of ICT policy is therefore much more focused on understanding and describing ICT as an instrument that could be efficiently woven into both the learning process itself and the accompanying organisational and administrative procedures.

Executive organs like the Kennisnet Foundation and the Surf Foundation, national pedagogical centres and sectoral organisations set up programmes, projects and action plans to serve the needs and demands of schools. These plans focus on three main issues: the professional development of teachers; the school as an organisation with an overall view concerning the integration of ICT, and the optimal use of digital learning materials.

Specific ICT programmes

Although the Ministry of Education no longer considers ICT to be a separate policy, it supports specific ICT multi-annual national programmes. These programmes aim to provide a broad impulse regarding specific ICT issues as formulated by the schools themselves or by sectoral organisations. Some actual examples of these programmes are:

- Media literacy : In 2007 the Ministry of Education founded an expertise centre for media literacy. This centre works together with more than 140 organisations, ranging from publishers to libraries and broadcasting institutions. The objective of this programme is to develop increased knowledge and the necessary competences regarding the safe use of new media.
- Stimulating the use of digital learning material: This programme was initiated in 2008 to stimulate increased use of digital learning material in primary, secondary and vocational education. An important part of the programme includes activities to establish a market of digital learning materials that performs well. To this end, the available digital learning materials are assembled and connected to portals and platforms that are easily accessible to teachers. In these public platforms, the supply and demand for digital learning materials will link up smoothly. The programme also provides any research information available about the popularity, user-friendliness and usefulness of various digital learning materials.
- Stimulating learning platforms for teachers: In order to support teachers in their professional development in the use of ICT, an online platform was created in early 2009 (www.leraar24.nl). This platform includes files and videos about different educational subjects supplied by teachers

themselves. In this platform teachers can learn from each other's experiences, share their methods and discuss the key issues that they are involved in.

- **Stimulating digital learning environments:** Increasingly, Dutch schools are making use of digital learning environments. The Ministry of Education initiates a special digital learning environment in specific cases. In 2009 a specific learning environment for talented pupils in primary education was started (www.acadin.nl). This learning environment provides information about talented children for parents, pupils and teachers. Pupils and teachers also use the environment as part of their teaching and learning programme.
- **Innovation programmes:** The SURF Foundation and the Kennisnet Foundation have been collaborating on a joint innovation programme since 2004. The project aims to enrich education through innovative and practical ICT applications relevant to the entire educational stream. Various products and services have been developed, including Make a-Game, Expert at Distance, Video Portal, and Expose Your Talent.

Quality assurance

The Education Inspectorate oversees quality. Around 200 inspectors make more than 10,000 visits to schools every year to find out whether they are in compliance with statutory obligations and are adhering to their prospectuses and school plans. When observing lessons, the inspectors also assess the teachers' teaching methods. The advice they give to schools helps improve the quality of teaching. Every year the Inspectorate submits about 25 reports – including the annual Education Report – to the Minister of Education, the secretaries of state and Parliament. School report cards ensure that information about educational quality in schools is available to the public.

Education is governed at national level by the Ministry of Education, Culture and Science. Provincial government is almost insignificant in the field of education. Municipal government runs public schools (mostly in primary education) and is responsible for cooperation between schools and other youth services.

One of the variables measured for the quality of education is the competences of the teacher. The necessary competences of the teacher are defined by law. This law prescribes seven required competences that teachers should possess. ICT competences are integrated within this law. School boards are responsible for assessing teachers' competences (including ICT competences), following the directives of the law mentioned above. These assessments take place during the annual performance appraisals and through interviews with teachers by the management of the school.

Initial teacher training

One of the elements of government policy is to ensure that future teachers are well prepared to use technologies to support educational and learning processes. Since the mid-1990s, the government has provided those institutions with facilities, with the aim of playing a pioneering role in that area.

Institutions that provide initial teacher training are very well aware of the importance of building competences which enable ICT to be integrated into teaching. Although the use of ICT has become a normal part of Dutch education, technology is not compulsory in teacher training. At the moment several institutions for teacher training are working together to define a formal knowledge base of the basic ICT competences of initial teachers. School boards intend to use this notion as a standard for future competence overviews.

Students who receive teacher training are confronted with ICT and the different ways it can be used during study and work. They are sometimes challenged to undertake ICT-related projects, which they carry out at their internship school.

In the Netherlands the government does not prescribe which courses are compulsory for training in general. ICT courses are therefore neither prescribed nor compulsory. The initial teacher training institutes themselves formulate the curriculum, but, as mentioned before, the importance of building competences which enable ICT to be integrated into teaching is stressed by the government and the initial teacher training institutes.

Findings: survey and case studies

ICT infrastructure

In general it can be stated that a large percentage of educational institutes in the Netherlands have access to and make use of ICT: 97 percent of all institutes facilitate a Learning Management System, an electronic learning environment including an electronic portfolio system. Of these schools, 95 percent provide access to the Internet: some 83 percent by broadband and some 72 percent via Hotspot Wi-Fi network facilities. Technical settings, such as filters for access to certain websites, have been set for 50 percent of the educational institutes and 71 percent of the students stated that a Learning Management System was available, yet 14 percent indicated limited access.

When it comes to the employees of the educational institutes, it is clear that almost the entire staff have access to a desktop computer (55 percent) or a notebook (25 percent), which is facilitated at the institute itself; sometimes both facilities are available to staff (13 percent). Students either have a desktop computer (11 percent), a notebook (49 percent) or both (41 percent). Furthermore, the educational institutes stated that computers are available for use in one or more classrooms (92 percent), which is confirmed by students, who indicated that personal computers were used most of the time (47 percent), or for at least half the time during classes (40 percent). Finally, some 75 percent stated that they always had access to computers, as opposed to some 17 percent, who had it occasionally.

There is, however, a difference in perception by students and teachers of how ICT technology is used. Some 79 percent of the teachers stated that they used active boards, whereas students felt that these were hardly ever used (62 percent). The same applies to audio: 76 percent indicated by teachers, as opposed to 58 percent of students who claimed it was seldom used. For visual appliances, teachers stated that 46 percent never used a digital camera, 38 percent never used a video camera and 74 percent never used a mobile phone. For students, these percentages differ: 61 percent never used a digital camera, 77 percent never used a digital video camera and 64 percent never used a mobile phone.

Table 2 contains an overview of the availability of technology to students in teacher training colleges

Table 2: Availability of ICT

Availability of ICT	%
<i>Institutions with LMS, ELE, digital portfolio</i>	97
<i>Institutions with Internet for all students</i>	95
<i>Institutions with broadband connections</i>	84

<i>Institutes with Wi-Fi network</i>	71
<i>Teacher trainers with own computer at workplace</i>	92
<i>Students with own computer</i>	100

Almost all institutes have LMS and broadband Internet connections for students. About 75 percent of the institutes have a Wi-Fi network. Almost all teacher trainers have a computer of their own at their disposal at the workplace. Each student has a computer of his or her own and many of them own a PC and a laptop.

Technical support

All educational institutes claim to offer technical support: some 75 percent during office hours, 8 percent 24/7, yet 17 percent stated to only have limited technical support. 70 percent of the respondents felt positive about the services provided. More than 77 percent of the students were aware of technical support and were positive about the services it provided.

Staff at Dutch educational institutes evaluated their own ICT skills very positively, both at home and at work. Fewer than 6 percent felt uncomfortable in the field of ICT. Some 70 percent of all institutes provide training related to technological skills, for both students and teachers.

Besides an up-to-date ICT infrastructure, most teacher training institutes also have a well organised technical support structure.

Pedagogical use of ICT

Pedagogical use of ICT during classes and learning processes is an important factor. Some 80 percent of educational institutes have developed policies that encourage and support the use of ICT during lectures; 64 percent have a unit or a department focusing primarily on the pedagogical use of ICT. The formulating of objectives for the pedagogical competences of prospective teachers in educational institutes in using ICT has only been done on a small scale: 17 percent for the majority of the courses, 42 percent for fewer than half the courses and 25 percent, none at all.

Pedagogical support is offered to students by 3 percent of the institutes on a 24/7 basis, by 34 percent during office hours and a few institutes offer none at all. Of the students, 77 percent stated that pedagogical support was available, which was verified by 74 percent of the educational institutes. In general, both parties felt positive, albeit the number of students is higher compared to the institutes. Facilities such as a helpdesk for didactical support were considered vital by 74 percent of the students, and this view was shared by 69 percent, who felt that this also applied to technological support.

A limited number of educational institutes discuss the pedagogical competences related to ICT during job interviews (44 percent), but these competences count for less than 3 percent in the decision to hire candidates.

Pedagogical competences related to ICT were formally assessed but on a low scale; 44 percent of the managers and 50 percent of the teacher trainers confirmed such an assessment.

Of the students, 15 percent believed that their teachers felt confident about the use of ICT, 49 percent felt they were quite confident and 31 percent somewhat confident. Furthermore, the interviews with students show that the differences in ICT competences between teachers can be substantial.

Teacher training institutes have developed policies for stimulating the use of ICT. Teacher trainers often make their own choices as to how they use ICT during lessons. As a consequence, there is a large variation within and between teacher training institutes in the use of ICT. Objectives for the pedagogical competences of prospective teachers in educational institutes in using ICT have been formulated on a small scale.

Application of ICT

How important are certain applications of ICT for teacher trainers and student teachers? The answer to this question is that using ICT for communication and networking with students was considered vital to 88 percent of the teacher trainers; 64 percent of the students devoted the majority of their time to communication and networking; 21 percent indicated less than half the time. Of the teacher trainers, 65 percent felt that communication and networking with parents was an important issue and 83 percent felt that communication with the school management and educational bodies was important.

The majority of teacher trainers felt that ICT was quite an important tool for their own development and studies (98 percent), a management tool for organising work and for the registration of results (88 percent). Some 91 percent considered it a tool for preparing classes, 96 percent for finding material for preparing classes and 85 percent for use in specific concepts and skills. The use of ICT in learning processes to support various learning styles, such as individual learning, was applicable to 82 percent, whereas using it to support children with special educational needs (cognitive, physical and behavioural) to 77 percent. Using ICT to promote higher-order thinking was considered vital to some 74 percent, using it for teaching in a more creative way by 70 percent and, finally, 91 percent stated that it was important for stimulating learning by pupils within their own learning environment.

Table 3 shows the importance of technology to teacher trainers in teacher training colleges

Table 3 Importance of use of ICT by teacher trainers (N=102)

Importance of use of ICT by teacher trainers	% Not important	% Quite – very important
communication with your pupils	2	98
communication with parents	13	87
communication with school management and educational administrations	2	98
study for own education	0	100
organisation of your work and keeping records	4	96
preparation of lessons	3	97
finding digital learning resources	1	99
designing and producing your own digital learning resources	1	99
facilitating teaching-specific concepts or skills	2	98
supporting various student learning styles and personalising learning	2	98
facilitating the teaching of pupils with disabilities (cognitive, physical, behavioral)	8	92
supporting activities that facilitate higher-order thinking	4	96
supporting creativity	3	97
fostering pupils' ability to use technology in their learning	1	99

Teacher trainers believe that it is important to use ICT for communication with students, parents and the management of the school. They also believe that ICT is an important tool for their own education and study. ICT is considered by teacher trainers to be an important tool for personal education, for organising work and keeping records and for preparing and carrying out their teaching.

ICT is an important tool in the view of students, but once asked in what way they were prepared at school in the use of ICT as a tool for their own development and studies, 10 percent replied negatively. Preparing to use ICT as a management tool for organising work and for the registration of results was negative for 21 percent. Using this tool for preparing classes was negative for 32 percent, for finding material via ICT for 9 percent and for preparing digital teaching material for 29 percent.

Using ICT for learning and teaching in specific concepts and skills to support teaching was found negative by 24 percent. Using ICT for learning and teaching to support various learning styles and individualise learning processes was found negative by 50 percent, and using ICT for learning processes with children with special educational needs (cognitive, physical and behavioural) by 51 percent. Using ICT to promote higher-order thinking produced negative replies from 55 percent and to support creativity in learning material from 38 percent. Finally, 38 percent stated that they seldom used ICT for learning and teaching processes in order to use ICT in stimulating their own learning processes.

Despite the percentages given, students feel confident about their own skills with respect to the specific use of ICT: 72 percent claimed to feel very confident about using ICT in communicating with pupils, 59 percent in communicating with parents, and 79 percent with management and educational bodies. Some 88 percent felt confident about using it for their own development and studies, 81 percent for organising work and registering results, 87 percent for preparing classes, 83 percent for finding digital material and 66 percent for designing and creating digital material. Some 61 percent felt confident to

highly confident about using ICT for teaching and learning various learning styles and individualising learning processes. Yet only 47 percent felt confident about using ICT for learning and teaching children with special educational needs (cognitive, physical and behavioural). For those using ICT in learning and teaching to support higher-order thinking the figure was only 31 percent. When using ICT for creative learning 61 percent claimed to be fairly confident and 66 percent when using it to stimulate their own learning process.

Table 4 shows the importance of technology to students in teacher training colleges

Table 4 Use of ICT by teacher training students (N=87)

Use of ICT by teacher training students	% Never - seldom	% almost half of the time – almost always
communication and/or networking	16	84
own development and learning.	10	90
organisation of your work and keeping records	15	85
preparation of lessons	13	87
finding digital learning resources	9	91
designing and producing your own digital learning resources	28	72
facilitating teaching-specific concepts or skills	24	76
supporting various student learning styles and personalising learning	31	69
facilitating the teaching of pupils with disabilities (cognitive, physical, behavioral)	54	46
supporting activities that facilitate higher-order thinking	64	36
supporting creativity	35	65
fostering pupils' ability to use technology in their learning	39	61

At the teacher training colleges student teachers frequently make use of ICT for communication and personal education, for organising their work and keeping records, for preparing lessons and finding digital resources. According to the students, less attention is paid to training in the use of ICT in teaching environments with pupils with disabilities and in supporting activities that facilitate higher-order thinking and creativity. About 40 percent of the institutes do not devote any attention to the use of ICT to foster pupils' ability to use technology in their learning.

Trainee schools and ICT

The formal requirement for student teachers to use ICT during their traineeship is met to a very small degree: only 14 percent of trainee schools and 11 percent mentor teachers.

Innovative practices

Two case studies were conducted with the aim of giving some concrete examples of the role that technology is playing in teacher training colleges in the Netherlands. One case study was carried out in Rotterdam, the other in Hengelo.

Case I: INHolland School of Education (Rotterdam)

School characteristics

The training programme for teaching in primary schools is part of INHolland University, a large scale educational institute that accommodates some 33,000 students and 2,700 employees. INHolland has two educational institutes for primary education, which, after the merger in 2002, started a joint concept of developing competence-based educational programmes for primary education in line with the major/minor concept. Until that time, INHolland School of Education, Haarlem had provided training in accordance with the two curricula of the former Hogeschool Alkmaar and Hogeschool Haarlem. The Rotterdam School of Education (formerly known as Ichthus Hogeschool) worked in accordance with the Pabo⁴ New Style concept at four locations. The Rotterdam School of Education was accredited in 2008. In four of the five categories – objectives of the educational institute, curriculum, staff, facilities and internal quality assurance, the training was appraised as ‘good’⁵. For further reference (in Dutch): (<http://www.leernetwerkeducatie.nl/node/140>).

Tradition of innovation

The Rotterdam School of Education, including the locations in the Hague and Dordrecht and the DigiPabo (a digital training programme for primary education in two variants: two years and four years of education), has developed a typically innovative tradition over the past ten years. This has formed the basis for developing a totally new educational concept in primary education: EXPLO. The Pabo was one of the two primary school educational institutes subsidised by the Dutch government to redesign the curriculum, which was to be characterised by intensive use of ICT (via tutoring), the so-called ‘turning over’ of the training programme, collaboration between task groups and working on actual assignments.

In line with its tradition of innovation, INHolland University of Applied Sciences started the new master’s programme, Learning & Innovating Processes, on 1 February 2009 in The Hague and on 1 September 2009 in the Hague and Amsterdam. This master’s programme is intended for talented and experienced teachers, who wish to excel in their educational skills and come from a wide range of educational levels: primary, secondary or intermediate professional education. A major part of this programme is carried out digitally. Furthermore, three employees are currently working on their doctorates in the field of ICT and education: collaborative learning, blended learning and professional online reflection.

During the external assessment in which the schools were visited, it became clear that this tradition has produced excellent results, the ‘educational crown jewels’ or ‘invaluables’, which will be discussed later in this document. Innovation is an ideal point of departure for training new teachers, with a well-considered use of ICT in learning and teaching processes. During the interviews it also became clear that innovation is experienced and promoted by a strong team of innovators in education, who are perfectly aware of the fact that a large number of their fellow-teachers in educational institutes do not yet use all available opportunities. The most important message that the training programme will convey in the coming months is that opportunities in ICT will be increased to include as many student teachers and teacher trainers as possible. This mission will have a major position within the developments of the new

⁴ PABO = Pedagogische Academie voor Basisonderwijs, translated: Teacher Training College for Primary Education.

⁵ Appraisal by the NVAO, the Dutch-Flemish Accreditation Organisation is conducted on a four-point scale: unsatisfactory, satisfactory, good and excellent.

INHolland Faculty of Education, in which all teacher training colleges will join (both grade 2⁶ educational institutes and primary school educational institutes) and will be supported by close cooperation with the Centres for eLearning and Integrated Pedagogical Behaviour.

Available ICT facilities

The Rotterdam location of INHolland offers a large number of computer facilities to students. All floors have 'open space learning centres' providing computers, including the library and multimedia centre. The School of Education has its own wing, with computers freely available to students and separate rooms for employees. Each room has a computer with Internet access and a digital video projector. All students and employees may log in at home or anywhere in the world to all digital files and facilities. The Service Desk lends out all kinds of ICT appliances, such as notebooks, digital video projectors and audio and video equipment.

Despite all these technological facilities, students tend to be critical of the lack of preparation for the use of digital blackboards and, furthermore, many students feel they hardly touch upon this facility during their studies and that they receive insufficient training in the use of digital blackboards.

The 'educational crown jewels' of the INHolland School of Education

In the past ten years a number of innovative initiatives and projects at the Rotterdam School of Education have led to successful implementation. Below you will find a list of the most successful examples of the implementation of ICT use in teacher education, called the 'crown jewels' of the INHolland Schools of Education .

Educational Plaza

The Rotterdam School of Education uses digital learning environments that were developed in-house as a means of support for specific processes in the training programme. At the Educational Plaza all the learning tools are managed, in order to have continuous quality control. Keeping all the tools and material up to date is a quality check by the owners of the tools, enabling students to search and filter, based upon their personal settings – full-time, part-time or digitally.

The Educational Plaza is a customer-friendly CMS (Content Management System) used by all students and teacher trainers. Its main principle is that a document is saved and moderated by one person only. This concept allows all educational variants and locations access to all student materials such as PPT, PDF, Word documents, video and audio materials related to modules, manuals and additional materials. It is a moderated environment, meaning that alumni and practical training centres do not have access to it. The Educational Plaza has about 1,500 visitors a day and it forms an essential digital environment for both students and teachers, who praise its 'open and transparent' community.

Learning Network Education (LNE)

LNE (<http://www.leernetwerkeducatie.nl>) supports practical learning and operates as a communication platform between the institute and the practical training centres. This incorporates the quality care of practical learning and enables each student to be linked to a desired and fitting profile in a learning environment. Furthermore, this will improve the supervision of practical learning. Its potential target group is 15,000.

⁶ In the secondary school system, a distinction is made between first classes and final groups. Only postgraduate teachers are allowed to teach the latter.

Currently investigations are being made as to whether it will be possible to operate as an ‘open source’. LNE evolved from VPE (*Virtuele Praktijkappliatie Educatie* (Virtual Practical Appliance of Education)), <http://www.pabo-inholland.nl/VPE/inlog/index.php>): designing curricula and keeping various parties involved in the content. All the actors play a major role: a student enrolls for a traineeship, trainee schools offer traineeships, and the platform is used for providing information and communication; in short, the entire process from enrolling a student to finding him or her a traineeship. The LNE encourages teachers to add appropriate links and the departments provide the content. For more information, please visit the ICT-E line (educational use of ICT within primary education) of the PABO: http://www.pabo-inholland.nl/index_pi.php?main_item=33.

People as educational architects

The simulated learning environment *Mensen Maken Scholen* (People as Educational Architects) http://www.pabo-inholland.nl/index_pi.php?sub_item=30&main_item=23 () offers final-year students the opportunity to create a virtual primary school and to develop and present it as a team member of that school. This virtual environment allows mentor teachers to intervene in various roles, which will confront students with realistic, problem-based questions and also deal with problems that occur in real-life professional situations. An external request has been submitted to develop this environment within the new Faculty of Education.

Digipabo

Digipabo started as an experiment in 1998 as a distance learning variant of the primary education training programme, in which all training is incorporated virtually. Today, this experiment is a fully-fledged educational programme and has become a ‘test bed’ for ICT experiments. Please visit the following site for further information: [http://www.surfspace.nl/nl/GoodPractices/Pages/DigiPabo,eenvolledigdigitalelerarenopleidingbasisonderwijs\(updatejanuari2005\).aspx](http://www.surfspace.nl/nl/GoodPractices/Pages/DigiPabo,eenvolledigdigitalelerarenopleidingbasisonderwijs(updatejanuari2005).aspx)

Digipabo allows student teachers to study at their own pace. Some students ‘save’ one year’s study time and others may take additional time if needed. The students we interviewed stated that, due to their personal situation, it would not have been possible to have become a teacher without the ICT facilities and the support of Digipabo. For these students distance learning opened the gate to the teaching profession. The students are highly motivated and enthusiastic about the learning facilities provided by Digipabo. Although the Digipabo students evaluated their technical skills very positively, they reported a strong need for support in the pedagogical use of ICT.

Online graduation location

At the virtual graduation location students work on a research plan in their fourth and final year, under the supervision of an e-tutor. This research plan will form the basis of their bachelor thesis, which will be carried out almost entirely online. Students work in pairs and one of the vital tools is the provision of online feedback. In five steps students go through the programme in which the research plan will be formulated. The quality of research plans for bachelor theses within the training programme has improved significantly. At the moment, the concept of online graduation is proving such a success that it will be applied within all kinds of educational variants, both within and outside secondary teacher training studies.

Case II: Edith Stein (Hengelo)

School characteristics

Hogeschool Edith Stein/OCT in Hengelo is a teacher training college for primary education for Catholic, public and Protestant schools. With some 1000 teacher students (83 percent full-time, 17 percent part-time), 137 staff and 75 teacher trainers, Edith Stein is one of the smaller universities of Applied Sciences in the Netherlands, but is proud to be in the top ten of best teacher training colleges in the opinion of students.

For further information about the history of this university (in Dutch): <http://www.edith.nl/>

Edith Stein has entered into a partnership, *Twente School of Education*, with Expertis, Saxion Hogescholen and the University of Twente.

A social basis for the school support for innovations

It became clear during the interviews with management, teacher trainers, research professors, ICT coordinators and student teachers that the starting point for their innovations and policy changes has to be borne by a social support base of all stakeholders. There is no top-down ruling, but bottom-up decisions, shared by many.

The management is clear about its ambitions to create a knowledge centre at the university for all stakeholders, including the trainee schools, but is at the same time realistic in its view that, with limited means and staff, only those innovations with top priority can be implemented.

Observations on ICT use

Students are more positive about the ICT situation than are managers and teacher trainers. The college has 400 computers available for student use. In recent years the Electronic Learning Environment has been changed to a SharePoint-driven environment, which has clearly contributed to growing satisfaction by students (webmail, My Site, education portal, H-disk etc.). When students want to enroll, they have to use *Studielink*, the national portal to register for higher education. When accepted, they will find all the necessary information and materials on the *Electronic Learning and Operating Environment Edith Stein*. They use this ELE also for submitting papers and assignments, for their marks, etc. A full electronic portfolio will be available for general use in the near future.

ICT coordinators would like to see the replacement of five-year-old computers, but students do not complain about the Internet speed or the quality of the ICT used. ICT coordinators have also requested a clearer ICT policy and plans, and would like to avoid ad hoc developments and decisions.

Teacher trainers, ICT coordinators and managers are not unhappy with ICT in the training situation and make it clear that indeed a large group of teacher trainers are using ICT in their teaching, but that there still is a minority (some 20 percent) that is lagging behind. Besides, the departments in many disciplines have not really integrated ICT into their teaching and there is still a lot of work to be done in this respect ('many teacher trainers do not feel ownership here'). The management mentions as one of the characteristics of the college that teacher trainers who need support, for instance in the use of ICT in their teaching, will be linked to a 'buddy', who is more experienced in that field.

The students support the view of the coordinators and the teacher trainers that they would like to have wireless access for laptops installed, but they do not agree with the idea that students' pedagogical ICT skills should be tested separately.

There is a growing awareness expressed by several respondents and supported by some empirical evidence that the generation of 'digital natives' is far from being as competent and skilful in using ICT (in a pedagogically sound way) as many people expect.

Lessons learned

- Integrate ICT into educational practices. Do not run ahead of things.
- Let people make do-able steps, otherwise they will stumble.
- Reflect regularly, with the aim of considering or reconsidering your priorities.
- Ensure that the co-ownership of the use of ICT-in-education is experienced by teacher trainers and student teachers.

Edith Stein's 'Crown jewels'

Apart from the Electronic Learning Environment and the conviction that innovations at Edith Stein have to be small scale and socially broadly based, the two research centres are considered to be essential for innovation and the promotion of ICT in teaching and learning: 'Rich media and teacher learning' and 'Virtual development of young people'.

Rich media and teacher learning

Multimedia technology is a good means of achieving interaction between practice and theory. Digital video especially makes it possible to register practical action and discuss this with others. It is also possible to gain more in-depth knowledge of these activities from a theoretical perspective. Abstract concepts are in this way situated in the complexity of professional practice.

The objective of the Centre is to use design-oriented research to gain practical knowledge and create products related to the use of ICT in teacher training. All projects aim to achieve these two goals. The projects focus on two themes: collaborative distance learning (e-tutoring, e-coaching, weblogs as a means of reflection) and visual knowledge building (use of digital images as a means to construct knowledge and make it accessible to others). The results of the projects are being implemented in the college curriculum. Often this is carried out in steps: one research fellow shows the viability of an idea by putting it into practice in a limited group of students. Improvements will be made based on assessments. An improved version will be tested among more students and more colleagues. After evaluation and revision, it will be scaled up in the entire college.

Safe virtual development of young people

This Research Centre aims to contribute to a safe and healthy virtual development of young people. In the past five years the media have paid great attention to the influence of media on young people, for whom the computer has become a part of their lives and is no longer merely an instrument or medium. In addition to healthy physical, socio-emotional, cognitive, creative and sporting development, young people also have the right to healthy virtual development. Older people often lack knowledge of the use of new media by young people. They are therefore not able to help their children sufficiently in their healthy virtual development. This Research Centre will contribute to sound virtual development.

Overview of conditions

Based on the questionnaires and case studies, we have identified the following enablers and obstacles for the use of ICT in teacher training *Enablers*:

- Access to adequate and reliable ICT materials on the university's ELE for both teacher trainers and student teachers.
- A policy at institutional level, representing a shared vision and focus on the use of ICT in education. This refers to leadership. At the same time it is important that teacher trainers are stimulated towards personal entrepreneurship in applying the innovative use of ICT.
- Great confidence shown by teachers (both teacher trainers and student teachers) in their ability to use ICT for pedagogical and administrative purposes.
- The case studies show that the success of developing and using the 'educational invaluable' is indebted to change agents (personal entrepreneurship), who are able to connect the potential of technology with the requirements of education. The role of these change agents is twofold: firstly, it is linked to the school and is a vanguard for initiation and the introduction of innovations; secondly, it is capable of blending pedagogical and technological information in such a way that it yields functional designs.
- Both case studies illustrate the importance of synergy between management, the traditional education, the support staff at the teacher training institute, research centres, ICT doctorate projects and new innovative educations. This combination of expertise works as an amplifier for further innovation.

Obstacles

- One of the major obstacles is the fact that not all teachers use the facilities of ICT and digital environments. One of the suggested solutions is to encourage them to use the facilities in order to convince them of their practical use and advantages and to be stimulated by their students, although that target group is not always involved either. Nevertheless, besides assumptions about the potential of ICT for learning, stronger evidence is needed to convince teachers of the added value and effectiveness of ICT in schools.
- Both students and employees have indicated that the quantity and quality of facilities leaves room for improvement.
- Students have indicated difficulties in implementing assignments, as certain ICT tasks cannot be performed at the traineeship location. Some schools where student teachers fulfil their internship do not have access to today's ICT facilities. Not all student teachers are given the opportunity to practise the competences which are necessary for the pedagogical use of ICT. Apart from that, most traineeship schools are not connected to the university's network (ELE).
- The aim of preparing student teachers in the use of ICT is supported at policy level but a quality check or a guarantee of the performance level is lacking. Practising the use of ICT for pedagogical purposes is often optional, without obligation or adequate assessment
- ICT should 'always work properly'. For example, interactive whiteboards and classroom response systems do not always work properly hence are used less.

- Lack of role models for the use of ICT in teaching.
- Lack of evidence of the impact of ICT on teaching and learning
- Lack of balance between policy ambitions and the availability of ICT materials and the competences of the teaching staff
- Wrong assumption that all student teachers are digital natives, who have been well prepared for using ICT for learning.
- Lack of ownership and entrepreneurial attitude of teachers to explore and incorporate ICT in their lessons.

Summary of key messages

- There is a widespread positive attitude towards the use of ICT for educational and administrative purposes.
- The basic technical facilities of teacher training institutes include access to computers, internet connections and electronic learning environments for teachers and students. Access, maintenance and technical support are well organised.
- The general belief about ICT innovation processes and projects is often that other people will follow automatically. There is an increasing awareness of the gap between early innovators on the one hand, and the majority on the other hand.
- Early innovators are often advocates of technology. The majority will use ICT if they see an advantage or if convincing evidence about its effectiveness is available.
- All parties involved agree that students need more 'self-managed guidance' in working with ICT, instead of the present 'freedom'.
- Teacher trainers and student teachers believe that ICT is an important tool for both pedagogical purposes and administrative purposes. Teachers and students feel competent about their technical skills, but they are less confident about the pedagogical use of ICT for learning purposes.
- The pedagogical use of ICT is promoted. Actual use of ICT is optional for most teacher trainers and in many cases also optional for student teachers during their internship. There is hardly any regulation or mandatory standards that guarantee a certain level in the preparation of all student teachers in the use of ICT by well prepared teacher trainers.
- During their training student teachers meet hardly any role models who demonstrate the outstanding pedagogical use of ICT.
- The use of ICT should be promoted more actively at meetings between traineeship schools and the educational institute.