OECD/CERI ICT PROGRAMME

A Case Study of ICT and School Improvement at

Secondary School, Hall, Austria

February 10th, 2001

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Introduction

The principal reported on an important new regulation which will effects all the teachers, the principal, and the carrying out of this study. Every teacher in Austria will expected to attend either in-house or outside courses in ICT by December 31, 2002. With the knowledge acquired, every teacher should use ICT and integrate it into his/her teaching. A further mandatory requirement is that all school districts in Austria provide their schools with Internet access by December 31, 2001. This news came on short notice, so the general reaction was one of fear or reservations. There is a simple reason for this: Teachers are ready and willing to get further education in ICT, but the basic conditions are wrong. The PI (Pedagogical Institute) offers too few ICT courses to satisfy the demand. As a result, there are long waiting periods and frustration on the part of those forced to wait. To summarize, the general attitude toward ICT has rapidly deteriorated.

The deterioration of ICT working atmosphere also had consequences for the executing of the interviews and the filling out of the questionnaires. Some teachers refused to do an interview or to fill out a questionnaire. The principal and teachers interested in IT, however, were very helpful in supporting this study, and in the end, ten of the school s 28 teachers filled out the questionnaire.

Overview of the present

Hall is a small historical city situated 10 km east of Innsbruck, the capital of Tyrol. Hall, which is known throughout Austria for its beautiful old town and its medieval flair, has 12,314 inhabitants. The social stratification is varied, with occupational groups ranging from hourly workers to EU commissioners. The secondary school of Hall is located in the center of the old town. In the 2000/2001 school year, it had 268 students (154 male; 114 female) aged 10 14 taught by 28 teachers (14 male; 14 female). Students and teachers participate in some European projects (e.g. the Comenius project) and work together with several sites of other countries, e.g. Italy, Spain and Finland. Therefore the school administration created a new name for the school: Europahauptschule Hall or European secondary school of Hall .

This school offers two pedagogical areas of emphasis: languages and ICT. The language emphasis should help to remove the language and cultural barriers in the minds of the students. Languages intensify political and cultural contacts and offer the necessary prerequisites for a successful professional life. Until a few years ago, language was the only emphasis at this school. Two of three classes were conducted as special language classes, and one class was conducted as a normal secondary school. The logical consequence was that high ability students attended the special language classes, while low ability students had to choose the normal class because they couldn t pass the language class. The normal classes were devalued. The principal and his team saw need for action. ICT was the buzzword, and the new emphasis was created in 1999. The second pedagogical concept at this school is based on ICT. There are two computer-labs with 13 desktop computers per lab and four classes with one stand-alone PC. All PC s in the labs are connected to the Web and are integrated into two ISDN-LAN-networks (10 Mbit and 100 Mbit). The staff created an extraordinary curriculum for ICT with a special schedule for each of the four years (the same as in other ICT schools). The local school board approved this self-initiated school-program and provides the additional funding for the staff and the municipality of Hall provides the funding for the necessary hardware.

The newly established ICT emphasis has attracted many students, and by the beginning of the school year 2000, two consequences were noticeable. Firstly, some of the students who applied for this ICT emphasis were toying with the idea of attending the neighboring high school. Secondly, more students applied for the ICT than the languages emphasis. The principal therefore decided to conduct one and a half classes with an ICT emphasis and the other one and

a half classes with a languages emphasis. As the IT specialists and the principal put it, The attractiveness of ICT is impressive and amazing.

Overview of the past

The language classes are conducted very successfully and have a good reputation. Because the number of applications often exceeded the capacity of these classes, the normal class was seen as less desirable. In fact, the main problem of the European secondary sSchool was the bad reputation of the normal class, which handicapped students and teachers. In an effort to increase the reputation and value of the normal class, the principal and a small team of teachers decided to establish a new ICT emphasis starting in 1999. A further goal is to provide students with ICT skills, thus fulfilling the expectations of the economy and advanced schools.

The first step toward establishing an ICT emphasis was to install all the hardware and software. This school maintains close contacts with the municipal authority that provides the necessary hardware, and these good contacts opened up the possibility to share a common ICT project Hall vernetzt or Hall connected . The aim of this project was to integrate all the public institutions of Hall into an ICT network. The European secondary school functioned as test object, with the municipal authority and private institutions providing the computers and lines for the school. Teachers and students worked together to lay all the lines in the school and install all the computers by themselves during their vacation. The integration of students into the installation process was a great success because the students were engaged, interested and got practical experience with hardware and software. The main key to the success of this school project was the unusually high level of engagement of a small teacher team and the many unpaid hours they invested (the same as in other ICT-schools).

One teacher took over the leadership role, dealing with computers (hardware and software) early on. Little by little, he tried to get more and more teachers with enthusiastic about the new technologies. Some teachers were suspicious of the new technologies and fearful of the uncertainties. The main fear of many teachers was that the students might have more technical expertise than they themselves. Professional development was based on two concepts: external and in-house ICT trainings. One great problem occurred at this stage: teachers showed willingness to take ICT courses, but the demand cannot be satisfied despite the PI s increasing the number of special ICT trainings it offers each year (just the same as in other federal provinces). The two IT specialists from the school organized in-house ICT courses, training their colleagues and giving them support. Some teachers who were interested in ICT attended further trainings and passed the ICT examination.

Projections for the future

What remains to be done to complete the whole process? First of all, every class should be equipped with at least one or two PC s which are multimedia ready and connected to the Web. These PC s will function as an information pool in every classroom. Every teacher should have the possibility to use a PC and the Internet directly in the classroom during his teaching. These additional investments will help compensate for capacity problems in the labs. A second goal is to get old PC s, for example those that banks are replacing. The students might remove valuable components from these old PC s and put them together to make more powerful PC s. This kind of work will provide the hands-on experience which the business world demands. The third goal is to connect the whole school building with a 100 Mbit-network. Another necessity is for the school to keep and hire IT specialists and ICT-trained teachers who will maintain and improve the present situation. And last but not least, the dream of the two IT specialists is to have a system administrator who supports the whole network and the teachers. One of the two IT specialists would like to reduce his teaching hours and take over the duties of a system administrator. This would relieve the IT specialists, who are completely overworked.

The main indicators of success that could be filtered out are the same as in other ICT-schools:

- Self-initiative and engagement of a competent teacher team
- Readiness of the proper authorities to change legal conditions to allow the implementation of self-initiated academic programs with an intensive focus on ICT
- Funding for the entire ICT project (hardware and software) and human resources throughout the whole process
- A school program containing goals, instructions, extraordinary curriculum and schedules
- Financial resources for additional rooms (labs, classroom)
- Openness to change among the whole staff

Conclusion about key hypotheses

The following hypotheses draw considerable parallels between this school and the other secondary schools in our sample.

Hypothesis 1

Technology is a strong catalyst for educational reform, especially when the World Wide Web is involved. The rival hypothesis is that where true reform is found, technology serves only as an additional resource and not as a catalyst, and that the forces that drove the reform also drove

the application of technology to specific educational problems.

The analysis of the data collected indicates that hypothesis 1 can be verified with some restrictions (just the same as in other ICT-schools). That means in the case of Hall, the implementation of ICT was not a planned social change but the start of a social change. If the teachers had decided to create another main emphasis like sports or music, that would probably have triggered the reform. Therefore, in this case, ICT and the language emphasis were both catalysts for school reform in the secondary school of Hall. The main condition is that a competent and engaged team of teachers oversee the whole school approach. The majority of teachers confirmed that a small team of teachers oversaw and organized the whole innovation, provided and continues to provide support, and will develop further improvements. Without their wholehearted engagement, the process of change is not possible. The use of ICT was identified as one solution for the specific need for change in Hall. As the solution for educational reform, ICT was the catalyst that allowed the plan to be put immediately into action.

Hypothesis 2

The diffusion of the reform (and therefore of ICT) followed the traditional diffusion pattern for reforms and innovation as outlined by Rogers (1995). The rival hypothesis is that technology functions differently from traditional innovations and reforms and that different diffusion patterns therefore occur.

The diffusion of the organizational change followed the traditional diffusion pattern. ICT was at the heart of the change process, but at the start it was not the driving force of the change (just the same as in other ICT schools). In the first step, the principal and teachers interested in ICT discussed the current situation. The result of this conversation was clear: There was a need to establish new emphasis which would attract students but also fulfill the demands of the business world and the advanced schools. The focus would be on creating a concept for the implementation of an ICT emphasis. Two teachers took over the leadership role. They organized the hardware and software installation, provided support, trained their colleagues, and increased their interest in ICT. Only a fraction of teachers passed the ICT examination. With the technical expertise they acquired, these teachers were able to teach ICT subjects and integrate ICT into their teaching. Until the basic conditions change, convincing the majority of the teaching staff will be difficult.

A special diffusion pattern in Tyrol could be the so-called TIBS: Tiroler Bildungsserver or Tyrolean Education Server which is comparable to the Education Highway in Upper Austria and Vienna. TIBS is a Web-based education network where schools and other educational institutions can post their own web sites and search for information about schooling and education. TIBS also offers e-mail accounts for teachers, students and school administrations.

Hypothesis 3

Successful implementation of ICT depends mostly upon the technological infrastructure and student ICT competence rather than upon staff competence in the integration of ICT into instruction. The rival hypothesis is that teachers mediate such applications when they are successful, and that their academic value relates positively to teacher competence.

In fact it is the rival hypothesis that applies to the situation regarding the use of ICT. The more familiar and comfortable teachers are with using ICT, the more they will use it for their teaching preparation and for their actual teaching. If the teaching staff lacks the necessary technical knowledge, the mediation of applications cannot be successful (just the same as in other IT schools). One IT specialist mentioned a case which verifies this hypothesis. A teacher of religious education started an ICT religion project designed to give the religion lesson a special character. She took a photograph of every statue of a saint in Hall s church with a digital camera. Afterwards, she posted the photos with special commentaries on the Web so everybody, including her students, could take a virtual tour of the church. She acquired the knowledge necessary through external courses and the help of the IT specialists. Without the technical expertise, she could not have carried out this project by herself.

Professional development plays a very important role because the main fear of many teachers was and is that the students might have more technical expertise than they themselves do. Several teachers said that they were willing to pursue ICT professional development and they had applied at the PI and other ICT trainings, but the courses were always full. There is an urgent need to change this situation, which has had another consequence: Some teachers have acquired the technical expertise they apply in their teaching on their own, e.g. through the Web or reading technical literature. To quote one IT specialist: Through the self-study in the Web, I find the latest news, which I integrate directly into my teaching. Therefore my students are informed about the latest technical advances. This kind of teaching is not possible unless the teacher is informed and well-educated.

Hypothesis 4

Gaps in performance between high and low income students will be enlarged rather than diminished where all students have equal access to ICT. The rival hypothesis is that equal access to ICT will lead to high poverty students closing the gap with low poverty students.

In the case of equal access to ICT, students performance depends on their personal interest and engagement. The condition of equal access to ICT is satisfied, on the one hand, during the lessons. But on the other hand, equal access is not guaranteed at home, where homework or exercises have to be done (just the same as in other IT schools). Engaged and interested students find ways to use computers outside the school, e.g. meeting classmates who have a computer at home, but the competition conditions are not the same.

The teachers of Hall estimated that 50 - 90 % of their students have a PC at home. Having or not having a PC in Hall depends on two issues: the social stratification and the main emphasis of the class the students attend. Most of the students from the ICT emphasis have their own PC at home and all ICT students have a private school e-mail account because the first-year curriculum includes Web communication, e.g. the use of e-mail, sending SMS s and chatting.

Hypothesis 5

Successful implementation of ICT will lead to the same or higher academic standards in spite of the low quality of many ICT materials. Academic standards are a function of teacher and school expectations and not of the standards of textbooks, ICT materials, and the like. The alternative hypothesis is that ICT use will lead to a lowering of academic standards as students spend more time on marginally beneficial searches and in browsing poor quality Web and courseware content.

In fact, academic standards are a combination of teacher and school expectations. One IT specialist reported: Yesterday, I showed my colleagues a web site with 5,000 prepared worksheets. The teacher just has to decide which teaching material to use during the lesson. These undreamed-of possibilities didn t exist in the past. The task of the teacher is to choose the material that will be beneficial. If the teacher selects good ICT teaching materials, then ICT will not lead to a lowering of academic standards. On the other hand, if he or she does not pre-select special web sites and allows the students to browse the Web without any restrictions, many students will be overtaxed because they will not be able to understand all the information they find. As one IT teacher put it: Students with high ability, good linguistic proficiency and self-organization are the winners when it comes to the new technologies because the others are often lost in the maze and completely overtaxed.

Characteristics of the school

Name of school site	Europahauptschule Hall
Address	A-6060 Hall in Tirol, Bachlehnerstraße 2
Phone / Fax	+43-0 52 23/45 0 24
Web site	http://www.euhs-hall.tsn.at
E-mail address	direktion@euhs-hall.tsn.at
Administration	Principal: Mr. Wilfried Hammer
Number of classes	12
Number of students	268 (154 male, 114 female)
Number of teachers	28 (14 male, 14 female)
Kind of school	Secondary school for students between the ages of 10 and 14

Characteristics of school autonomy:	
School experiment	<u>ICT</u>: Secondary school for information technology (offers part of the examination in ECDL = European Computer Driving License) <u>Language</u>: The students have the possibility to choose three languages (Italian, English, French).
Unusual features	IT in the 1st year (1 lesson a week)
	Typing in the 1st year (1 lesson a week)
	Information about professions in the 3rd and 4th grade (1 lesson per week)
	Participation in the EU Comenius Project , the ÖKO-Audit-Project and many IT projects e.g. Netdays , ENIS
Peculiarities of the school site:	
2 computer labs	13 PC s per lab (WIN95, WIN98 and WINNT) 2 servers (Linux) 16 printers (3 laser printers, 13 ink jet printers) 1 digital camera, 1 Web camera and 2 scanners
Further PC s	4 PC s only for teachers and administration
Internet connection	2 ISDN-LAN networks (100 Mbit-net and 10 Mbit-net)
Architecture	Old building in the center of Hall which is overcrowded.

Evaluation of change

Diffusion patterns

The principal and a teacher decided to introduce ICT as second emphasis in an effort to upgrade the reputation of the normal class. Both the school s IT specialists co-operate with the TIWAG which is a large IT company in Tyrol. One of the TIWAG s goals is to connect public institutions of Tyrol to the Web. Public institutions handle sensitive and confidential data, so the secondary school is well qualified to function as test system. Both partners, the TIWAG and the school, benefited from this cooperation. A further diffusion pattern was the project Hall Connected . The municipal authority of Hall started this project, which connected all the public institutions of Hall to the Web. Again, the secondary school of Hall served as the forerunner. Today, all Hall s public institutions are integrated into an ISDN network, so the school s network works extremely well. Further diffusion patterns are the same as in other IT schools. There was a small team of teachers who initiated, organized and oversaw the introduction of ICT. The authorities support and finance the entire concept, providing and supporting the technical infrastructure and allocating the funds needed to maintain and replace the technical infrastructure and last but not least encourage professional development.

Staff development and involvement

At present, the main problem in Tyrol is that there are not enough ICT trainings (just the same as in other federal provinces). The teachers want ICT development, but most trainings are full. As a result, there are long waiting periods for courses, and teachers are frustrated. For that reason, Hall s two IT specialists have trained and coached their colleagues voluntarily, in their free time and without pay, but that was a drop in the bucket. Both IT specialists mentioned a second point: Advanced trainings, e.g. supporting an ICT network, are not offered by the PI. These kinds of courses are very expensive, and the authorities won t pay for them. Some years ago, one IT specialist took a sabbatical year and worked as programmer at a private IT company. With the knowledge he acquired, he is now in a position to install and support the network. The other IT specialist is gaining technical expertise on his own during his leisure time. But what would happen if both IT specialists left the school? Nobody knows the answer.

Role of leadership

One engaged teacher who was interested in ICT took the preliminary steps. The principal and his team were responsible for implementing this school experiment and oversaw the entire ICT installation and staff development. These key persons also determined the next steps for the future (just the same as in other IT schools).

ICT reform connections

The negative image of the normal class was the starting point for establishing the new ICT emphasis. The majority of teachers believed that ICT was trend-setting and necessary because it gives the students the opportunity to acquire ICT basic qualifications which the business world and advanced types of school demand.

Outcomes

ICT Infrastructure

The following ICT infrastructure is situated in the secondary school of Hall:

1. Hardware
   Two computer labs with 13 PC s per lab. All PC s are multimedia ready and connected to the Internet. Four computers are situated in the main office and the conference room. Additionally 16 network printers (3 laser and 13 ink jet), two scanners, one digital camera and one Web camera are available.

2. Internet
   Internet access is managed by two ISDN networks (10 Mbit and 100 Mbit).

3. Support
   Both IT specialists installed the entire hardware and software and provide support for their colleagues and the network. If possible, teachers repair defective hardware themselves. In fact, both IT specialists invest a lot of time keeping the system running and they are completely overtaxed and underpaid.

4. E-mail
   One official school e-mail account was set up for the main office. Every teacher and every student in the ICT emphasis classes has a private school e-mail account which they use during the lessons.

5. System backup
   The backup of the system and the configuration is made by a streamer tape, but this is done on an occasional, not regular basis. Data created by teachers and students is not automatically saved. It is the responsibility of teachers and students to save the data they produce themselves.

6. Use of ICT
   Teachers and students use ICT for typing; in projects, spreadsheet analysis, word processing; in preparing and making presentations; for programming, creating and maintaining Web pages, for drawing pictures or diagrams, and to search for information. Learning software is used in special subjects e.g. English.

Effectiveness

The results of Hall show the same indicators of success as the other IT schools:

- Well-educated, engaged and interested staff members are absolutely necessary to integrate ICT successfully.
- Teachers attitudes and the conviction that they are on the right path is essential.
- Setting goals is important.
- Providing the necessary hardware and software for using ICT: Many teachers in Hall complained that both labs are always occupied. Teachers will not be able to integrate ICT into their teaching if the hardware and software is not available, supported and user-friendly.

Further factors impede the effectiveness (just the same as in other IT schools):

- The current situation of further ICT education (waiting periods of six months to a year). A lack of ICT knowledge and frustration are the negative results.
- The main fear of many teachers is that the students might have more technical expertise than themselves.
- The changing role of a teacher - from an instructor to a coach, and the new ways to work with knowledge. The teacher knows everything and the students know nothing, is an old adage that has lost its validity.
- Lack of capacity in the labs.

What are the most positive and the most negative aspects and impacts of using ICT (just the same as in other IT schools)?

Positive aspects

- ICT opens up the opportunity for students to develop valuable skills (team work, self-organization, being and working independently). These are good prerequisite skills for entrance into a high school or a profession.
- ICT is a strong catalyst for the students motivation; therefore it is also easier for teachers to teach their students.
- 50-90 % of the students in Hall use a computer at home. It depends on which emphasis the students attend.
- Handicapped students easily make friends with normal students in chat-rooms and via e-mail because, as one teacher expressed it, on the Web, the other person s nationality, race, gender and appearance don t matter.

Negative aspects

- Internet-addiction: Some teachers expressed their anxiety. As one IT specialist put it: I

installed a server and programmed a special chat-room called The Palace , which my students often use. I can observe the Palace, and I know exactly who is chatting at any given time because the students have to log in with an account. The same students often chat in the Palace for several hours. That is really alarming.

- Students motivation to learn: The students are very motivated to learn if they are allowed to use ICT. ICT takes over the part of an entertainer, but if the teacher has no possibility to use ICT, students are often not motivated to learn.
- The social stratification divides the students into two groups: those who have and those who do not have a PC at home. The school should close the gap between the social stratification, but is currently not in a position to do that because there are not enough ICT courses in the curriculum.

Academic rigor

The prerequisite for teachers to use ICT in their teaching is that they feel comfortable using a computer (just the same as in other IT schools). Continuous further education and a PC at home are necessary. 80 -90 % of Hall s teachers have a computer at home, the principal estimated. What percentage use ICT regularly during their teaching? One IT specialist estimated: 20 % of the entire teaching staff, and explained this small percentage as follows: The main problem is having an Internet connection and not having a PC at home, because anybody who cannot use Internet at home will never acquire the necessary technical expertise to integrate ICT into his/her teaching. There are two reasons for the low number of Internet connections at home: first, a lack of technical expertise and second, the cost. Many of the teachers use the PC for their teaching preparation, and some of them use it in teaching. Most of the teachers said that they get their knowledge about ICT through private studies because the situation of professional development in Austria is unsatisfactory.

Students can access computers in the school during the lessons, but not without monitoring. The average student spends three hours per week using ICT during school. Some teachers pointed that depends on the teacher how many hours a week students work with ICT. The teachers who teach the same subject, for example English in the same grade don t use ICT to the same degree in their lessons. The motivation to learn with the new technologies is high if the content is not too difficult to understand and the student does not have too much to read. Students are often overwhelmed by the information on the Web pages. One unique school project was carried out in the early stages of establishing the new ICT emphasis: Teachers and students worked together to lay the lines in the entire school building and install all the PC s in the labs during their vacation. The students were enthusiastic about the practical experience they acquired.

Equity

Differences occur between high and low ability students. One teacher summed it up like this: The winner of the new technologies are highly intelligent students who have language competence and good self-organization skills, because they can browse the Web without losing their orientation and they understand the content. Students who don t have these abilities often have a poor work habits. They are often overtaxed and lose their way in the Web. Gender differences also exist in ICT use. Boys use PC s and the Internet more hours per week than girls. Girls often use the communication part of the Internet (chatting and sending e-mails) and create nice pages. Boys play more computer games than girls. They also browse different web sites than girls, for example girls often search for movie stars, while boys tend to search for sex and game-pages. Differences occur also between high and low income students - not in school, but at home. High income students are more likely to access to a PC and the Internet at home than the others (just the same as in other federal provinces). Low income students therefore are at a disadvantage at school because they lack ICT skills.

Projections

Sustainability

What has to be done in Hall to maintain or improve the results of using ICT? The recommendations are the same as in other IT schools and can be divided into five categories.

1. Technical equipment
- Augmenting the existing equipment: each classroom should have at least one or two computers which are multimedia ready and connected to the Web. The old lab should be upgraded from a 10 Mbit to a 100 Mbit network, and last but not least, the lab should have a beamer.
- Regular replacement of the old technical equipment.

2. Organization
- Having one half-time IT specialist to manage the whole ICT system would be very helpful.
- Organizing access to the computer labs better would give every teacher the opportunity to use ICT. This is only possible if there are two PC s per class.

3. Staff

- Well-educated staff members are essential. Further education has to be guaranteed for everyone.
- It is necessary to hire and keep new, well-educated ICT teachers.
- The IT specialists who manage the support for staff and students should be better paid because they invest so much time in keeping the system working and are completely overtaxed.

4. Environment

- If the Federal Ministry set new goals concerning ICT, the persons responsible will have to provide the necessary basic conditions. E.g. if every teacher has to attend ICT courses by December 31, 2002, then the responsible authority must provide sufficient ICT courses.
- More parental interest in ICT to support the students at home. One teacher put it this way: In low income families, the PC sometimes serves as an instrument to keep the students busy and quiet.

5. Education

- Constant evaluation of the current needs in ICT skills for high schools in order to ensure that graduates of a secondary school have the skills the need.
- Teachers should encourage their students to practice responsible computing, thus avoiding abuse. One ICT course should be The Social Dimension of the Web .
- Openness to ICT further education among the whole staff

Scalability

What efforts and resources are required for full implementation and what benefits can result from it? This question must be answered indirectly, because the interviews didn t contain the necessary data. The main points are the same as in other IT schools and described below.

- The principal and the staff members must define a common goal which they will directly pursue. The whole staff should be firmly convinced that the school is on the right path.
- The authorities and the communities of the school have to support the efforts of the staff members not only by providing financial resources but also by creating the basic conditions necessary to act.
- Further trainings for staff members must be organized and supported in order to give teachers input on innovations and the opportunity to discuss pedagogical topics.
- All subject teachers should use ICT to the same degree their lessons; otherwise the students of teachers who don t use ICT in the lessons will be at a disadvantage compared

to the students of teachers who use ICT. The individual philosophy of a teacher determines whether he/she is suited to implementing ICT into his/her teaching.

- Teachers who are currently opposed to the reform should be convinced of the absolute necessity of the new technologies and that there is no getting around them.

Appendix A

Methodology

Description of the volume and type of data collected

Activity	Annotation	Amount
Verbal Interviews (approximately 45-60 minutes each)		
Nomination Form for a School Site	Principal	1
Administrator Interview	Principal	1
Parent/Guardian Interview	1 mother	1
Technology Specialist Interview		1
Student Interview	1 group of 4 male students (fourth year) 1 group of 4 female and 2 male students (fourth year)	2
Teacher Interview	4 teachers who were actively involved in and strongly identified with the reform. 2 teachers who were opposed to the reform.	6
Questionnaire		

ICT Use Survey of Teachers	Teacher		10
Observing in Classrooms			
Computer science	Fourth year		4 hours
English	Second year		1 hour
Mathematics	Fourth year		1 hour
Collecting additional materials			
Web-site presentation	http://www.euhs-hall.tsn.at		
Reports and addresses from ICT projects	ENIS, NETdays		
School profile			

Appendix B

ICT Use Survey for Teachers

15 teachers filled out this questionnaire (n = 10).
The results are represented in percentage (100 %).

- How comfortable are you with using a computer to do each of the following? (Choices are: very comfortable, comfortable, somewhat comfortable, not at all comfortable)

		very com-fortable	com-fortable	somewhat com-fortable	not at all com-fortable
1.	write a paper	50.0	40.0	-	10.0
2.	search for information on the World Wide Web	30.0	40.0	20.0	10.0
3.	create and maintain Web pages	20.0	10.0	-	70.0
4.	use a data base	20.0	20.0	20.0	40.0
5.	send or receive e-mail	60.0	20.0	-	20.0

6.	programming (e.g. writing a program in Visual BASIC or Java)	-	20.0	-	80.0
7.	draw a picture or diagram	20.0	20.0	20.0	40.0
8.	present information (e.g. use PowerPoint or equivalent	-	20.0	10.0	70.0

" During the past school year, how often did your students on average do the following for the work you assigned? (Choices are: several times each week, several times each month, a few times, never)

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		several times each week	several times each month	a few times	never
9.		10.0	30.0	50.0	10.0
10.	create web pages	-	10.0	20.0	70.0
11.	send or receive e-mail	10.0	20.0	60.0	10.0
12.	use a word processing program	20.0	30.0	40.0	10.0
13.	use a computer to play games	-	-	70.0	30.0
14.	use a spreadsheet	10.0	10.0	30.0	50.0