

B3 School portrait BRG Schloss Wagrain Vöcklabruck

1 General characteristics of the school

History and description of the school

The Schloss Wagrain Bundesrealgymnasium (BRG)⁵ was founded in 1993. It grew from the neighbouring Bundesgymnasium (BG)⁶, which was divided into two schools due to lack of space and excessive size. The new school was formed of 16 classes from the Realgymnasium plus 34 teachers from the Bundesgymnasium. Some of the classes and administrative services were accommodated in Schloss Wagrain, the remaining classes were first held in the Bundesgymnasium building, and since 2000 have been housed in a newly constructed annexe. Since the majority of teachers moved to the new school voluntarily, this led to establishment of a teaching staff open to change and innovation. In the last decade pupil and class numbers have doubled, facilitating appointment of younger teachers with additional qualifications.

BRG Schloss Wagrain is currently run as a Realgymnasium with 33 classes, 80 teachers and 908 pupils. It is located in the educational centre of Vöcklabruck, the capital of the region of the same name. There are around 12,000 inhabitants in the town, and 127,000 in the region. The BG and BRG are the only secondary academic schools in the region and therefore have a high proportion of children who have to travel some distance to school.

Since 1994 university lecturer Dr Erwin Rauscher, one of Austria's proponents of, and experts in, school development, has run the school.

An innovative head teacher and teachers receptive to innovation are the triggers for school trials and autonomous school measures at BRG Schloss Wagrain:

Campus

A supervised break of 30 minutes after the fourth lesson serves for teachers to offer pupils various activities: supervised work in the computer room, book discussions, sporting activities, musical activities and much more. Pupils and teachers have the opportunity to maintain social contacts and to communicate with each other – in varying, age-appropriate ways.

Portfolio

Every pupil is obliged to produce several portfolio assignments (product portfolios) in various subjects per school year. The subject teacher supervises. The project file is co-ordinated and checked by the class teacher. Digital portfolios are collated in the learning platform and burnt on to CD.

5 Secondary academic school emphasizing Mathematics and Sciences.

6 Classic secondary academic school.



Termly certification from Class 6 (Grade 10)

From Class 6 on a certificate is issued each term. If a pupil does not pass a subject, he or she has the option of obtaining a pass by sitting an examination on specified dates. If he does not pass this examination (it is possible to sit the exams twice) he need repeat this subject only. His passes in other subjects are not affected.

Subjects particular to the school

Galilei (Classes 2-4)

In this subject pupils learn about scientific practice. Laboratory work is carried out in the fields of Biology, Physics and Chemistry and assessed using ICT.

Media workshop (Class 2-4)

On the one hand theatre performances are rehearsed in this subject, on the other a school newspaper is produced using ICT.

NAWI (Classes 7 and 8)

Scientific lessons that combine subjects, taught alternately by biologists, chemists and physicists.

Economics (Class 6)

This subject combines Geography, Economics, History and Social Sciences.

Project weeks with the emphasis on sports, science or languages

International pupil exchanges with Russia and Costa Rica

Presentations, workshops, theatrical performances, musicals, choir, orchestra.

History of ICT

At the time the school was founded there were non-obligatory exercises in the field of ICT in Class 3, the compulsory subject Information Technology in Class 5, and optional Information Technology from Classes 6 to 8. Computers were used only sporadically in other subjects.

An initial move in the direction of IT integration into teaching was made in 1995, when a team of teachers who were receptive to the use of ICT in teaching and who already had experience in computer-based teaching was put together for an initial class. Some of them had been involved as teacher training consultants for the use of computers in teaching in the preceding years. The teachers undertook to teach at the computer for an hour a week in German, English and Mathematics.

First notebook class

4 Years later the school's first notebook class fundamentally sprang from this class association. In 1999 there was a Federal Ministry initiative to introduce notebook classes. BRG Schloss Wagrain was the only AHS in Upper Austria to take part in this campaign. The schools received assistance from the Ministry to the tune of 7,500 euros



for the requisite installation work, plus hardware and software procurement (servers, beamers, operating systems, standard software, Derive and others). The notebooks were purchased by the parents and remain in the possession of the pupils. Enrolment in this class starts at the beginning of upper school (9th grade) and is voluntary. Of 78 pupils in this grade, 22 elected to take the notebook class and 56 to take both regular classes. By the present school year (2003/2004) the trend had been completely reversed, with 56 pupils enrolling in 2 notebook classes, and just 22 in a regular class.

Lower school ICT model particular to the school

Since 1999 there has been an in-depth school development debate on measures particular to the school in the lower school. The teaching staff was unanimous that pupils should acquire ICT skills in the lower school. Subject teachers did not want to cede any of their subject hours for ICT as a separate subject. Some subject groups, however, declared their readiness to teach pupils ICT skills in their own subjects, which resulted in the following lower school model:

in Class 1 German lessons have taken on the additional responsibility of teaching word processing skills. Exercises formerly completed in an exercise book are now carried out on the computer. A teacher prepares 50 hours of lessons, made available to the teachers of German and pupils in the "WeLearn" learning platform on the school network. When putting together the exercises, care is taken that precisely specified ICT word processing skills can be achieved by working through them. At the end of the school year these are tested. A German lesson takes place in the computer room on a regular basis. During this lesson the class is split. During this time the parallel group has a compulsory ICT exercise that teaches basic knowledge of hardware and software, fundamental knowledge of the operating system, a presentation programme, a spreadsheet programme and algorithmic thinking using the "Robot Karol" programme. In addition pupils have to produce 2 portfolio assignments – one using word processing and other using the presentation programme. Pupils who duly produce this work and sit the tests on basic knowledge, word processing, operating system (file management), presentation programme and Internet are issued with a Level I IT certificate by the school.

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In Class 2 these responsibilities are assumed by English (word processing, presentation programme, Internet) and Art (image editing). Mathematics is responsible for spreadsheets, and Biology and Environmental Science for presentation and the Internet in Class 3.

Teaching material is being developed currently for these subjects, with the support of the Federal Ministry.

eLearning Cluster

In addition the school participates in the Federal Ministry's "eLearning Cluster". Four to five different types of school from each federal region (vocational schools, general education schools) collaborate in the field of eLearning or Blended Learning respectively. They develop teaching materials, exchange these with each other, try out lesson plans for using IT in teaching and pass on their findings.



An eLearning cluster in the educational field is a geographical concentration of associated schools, organizations and institutions in the fields of education and research, which has its own CI and own goals and benefits from a clearly demarcated field of co-operation for the joint acquisition and exchange of know-how and joint development of product and know-how.

These schools receive financial support from the Federal Ministry and therefore make specific commitments:

1. During the term of the project every pupil will try out “eLearning sequences” in lessons. In a step-by-step plan this goal is achievable within the project term, by July 2005.
2. Every teacher must have acquired experience of eLearning sequences within the scope of their own teaching activities by the end of the project term and made these findings available to every colleague in the subject and class teaching teams.
3. The subject groups and class teacher teams will jointly co-ordinate and together trial the opportunities, possibilities and limits of eLearning in lessons.
4. Within the cluster the model schools will jointly develop concrete models for trialing eLearning sequences in lessons and will make their findings available to all.
5. The school mission statement (short- and medium-term school goals and implementation measures) will incorporate “eLearning” discoveries regularly into planning of the daily school life.
6. Trialing eLearning in lessons is an important concern for school management. The project shall have a high priority in the daily life of the school.
7. There is a steering group that co-ordinates and harmonizes the use of eLearning content and teaching method models for trialing in lessons.
8. The school offers its pupils (voluntary offer) at least one IT or eLearning certificate superior to the European computer driving license.
9. Each school site shall have trialed lesson sequences for each subject. In subjects not key to the site’s educational aim, small modules will be accepted for model implementation, whilst fully elaborated lesson sequences will be prepared for core subjects and learning fields.
10. Every school site will develop a role profile for the eLearning co-ordinator at the school site and shall nominate or elect the regional chair of the cluster board.
11. Supplementary to point 7, members of the steering group are to be made known beyond the site. A subject group discussion is to be initiated about the relevance of eLearning teaching methods (what added value does eLearning have as a method for good teaching?). The lesson sequences addressed in point 9 will be trialed in all classes.
12. The exchange of information and subject-related materials may be conducted by means of exchange forums (e.g. Quick Place), content management or learning management systems. One of these tools will be installed at the school site or “hosted” for daily operation by the school by an external institution.
13. With the aid of development of tailored CPD events a large number of teachers at the eLearning schools should have a special ICT qualification (ECDL or similar) to show by the end of the 2003/04 school year.



ICT infrastructure

The school has a school network with 2Mb Internet connection via the Upper Austria Education Highway or the Austrian School Network respectively, 4 computer rooms (16/16/12/30 workstations), 5 networked notebook classes (cabling, teacher computer, beamer) with connection to the school network, and Internet access.

The special classrooms for Biology, Physics and Chemistry and Art are each equipped with a computer and some with a beamer.

One railway carriage is equipped with 4 computers for the media workshop (school newspaper).

Furthermore there is a file server, a web/FTP server and a server for the WeLearn learning platform.

6 teacher week hours (=12 working hours) per week are set aside for hardware management by the EDP custodians. In addition there is a budget of 8,000 euros per annum for repairs and new installations. An eLearning co-ordinator has 2 week hours set aside for implementation of eLearning Cluster goals.

Vision

The school is a mirror image of the society. It has a posteriori and a priori tasks. The a posteriori tasks are to reply to social challenges; the a priori tasks are to be active in shaping and improving society. The indispensability of pragmatic exploitation of ICT opportunities automatically ensues from this parallelism and homogeneity. This has the visionary consequence that use of ICT and its possibilities is a general duty of the school (school programme, school profile, model), and the pragmatic consequence that the school must create organizational structures for pragmatic achievement of this vision.

As a result of the structures developed (measures particular to the school in the lower school, notebook classes, eLearning Cluster), on the one hand pupils should attain ICT skills by use in lessons, and on the other ICT opportunities should be used for teaching in every subject. These include greater motivation, up-to-date materials, visualization of subject content, interactivity of programmes, experimental access to knowledge and much more.

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2 Changes for pupils

As a result of measures particular to the school in the lower school, (integration of IT into subjects), teaching has changed. Pupils work with digital materials intended to lead to original, independent acquisition of knowledge using ICT. They acquire ICT skills whilst dealing with subject content. The teacher becomes a supervisor in the learning process.

The computers are used in varied ways in the notebook classes. In Mathematics the school textbook is available in electronic form only (MathsSchoolHelp21 in conjunction with Mathematica). School work is completed on the computer using this programme too.

In Languages, Listening Comprehensions prove their worth with digital texts and songs in conjunction with completion texts (created using HotPotatoes).

In the Sciences and Mathematics, Java applets illustrate facts and facilitate experimental access to content. Simulation programmes (e.g. Dynasys) for modelling and simulation of dynamic systems promote lateral thinking.

Portfolio assignments in all subjects to research and process information using a word processing or a presentation programme, creating spreadsheets, conducting and analysing surveys and experiments, designing media, documented communication and co-operation in a foreign language, documentation and presentation of project work, modelling and simulation and subject assignments all contribute to ICT skills being applied and strengthened.

The following lessons were observed:

English, 8N class, notebook class

Pupils were assigned to annotate an English text submitted in Word, to find related words using the thesaurus, and to set these out in the commentary. They had to answer questions about the text in question. In the second half of the lesson they were given a song in the form of an mp3 file, to which they could listen using their notebook, plus a completion test to fill in, created using HotPotatoes (see picture below).

During the teacher interview the colleague mentioned that use of the Internet made handling more current texts and topics easier during teaching. Foreign languages have access to varied resources. Listening comprehension exercises can also be repeated or completed at home. Communication with pupils with other mother tongues is integrated into class work. Exchange of materials takes place via the learning platform.

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Mathematics, 8N class, notebook class

In the Mathematics lesson pupils worked with the learning package put together by the teacher on the topic of binomial distribution. This learning package contains a PowerPoint presentation to support a brief teacher presentation, group work instructions, a simulation programme (Galton's bed of nails), pre-prepared Excel spreadsheets to simulate Bernoulli experiments and instructions for calculating problems using Mathematica.

German, Class 1

Pupils worked on an electronic works sheet using the Word word-processing programme. It contained the instructions and the text to be processed. The teacher supervised the pupils' work. The parallel group researched the internal workings of the computer in ICT.

In pupil interviews, pupils were of the opinion that they had acquired additional skills through the use of IT and are cultivating a natural approach to computers. In notebook classes the computer is not just a learning tool but also a music box, a tool for communication with friends (ICQ), and with teachers too. For example, before a Mathematics assignment they can contact the teacher using ICQ and ask questions, or ask fellow pupils for advice.

Pupils also learn at the computer. Texts are only rarely printed out now. In some areas performance at school has not improved, but there is greater motivation to solve problems using the computer. Google is generally used to search Internet sites for a specific topic. Pupils believe that they are already significantly more focused and successful in seeking information than pupils in other classes. Educational servers tend to be used more by teachers. Teaching materials are made available via the WeLearn platform, developed by the University of Linz. Homework is submitted via this platform. In Mathematics class assignments are written on the computer. An example is to be solved without the computer. From Class 7 the computer is used for writing class assignments in German and English. In the opinion of the pupils there are some teachers who do not use the computer enough.

3 Changes for teachers

In the opinion of the teachers the use of ICT demands a change in teaching methods. Assignments and materials have to be prepared accurately, as this is the only way that the transition from teacher-focused lessons to pupil-focused lessons can succeed. Pupils need specific assignment tasks. The products and results, the knowledge expected at the end of a teaching sequence, must be clear. Varied lesson plans are important. A learning platform assists in the exchange of electronic materials.

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Some of the web sites used:

Bildungsserver Oberösterreich [Upper Austria Education Server]:

<http://www.eduhi.at>

Bildungsserver Österreich [Austria Education Server]: <http://www.schule.at>,

<http://www.bildung.at>

Bildungsserver Deutschland [Germany Education Server]: <http://www.zum.de>,

<http://www.dbs.de>

Standards: <http://www.gemeinsamlernen.at>

eLearning: <http://www.eteaching-austria.at>

European Network: <http://www.eun.org>

Search engine: <http://www.google.at>

Mathematics: <http://www.mathe-online.at/>, <http://mathe.asn-graz.ac.at>,

<http://www.learn-line.nrw.de/nav/sekundarstufen/mathematik/>

MS Office is used as the standard software in most subjects. MS Word, MS Excel, MS PowerPoint and MS Access are used. In addition HotPotatoes, MindManager, Encarta and multimedia CDs are used.



MathsSchoolHelp21 in conjunction with Mathematica is used as the electronic textbook in mathematics. MS Excel and Dynasys are used too. Electronic dictionaries and a thesaurus are used in Foreign Languages.

Pupil's work is assessed, whether portfolio assignments or class work on the computer or work sheets completed. Teachers plan varied lessons – all forms of teaching from teacher-focused to purely pupil-focused lessons in conjunction with group work. The foundation for further training for teachers is the "Intel – Lehren für die Zukunft" (Intel – teach to the future) programme. A 40-hour training course, consisting of 15 modules, from which teachers can choose. (<http://www.intel-lehren.de>) 80% of teachers have followed this course. 10 teachers have gained their ECDL. Online course are also available (<http://www.e-lisa.at>). Discussions on the use of ICT take place in the subject groups as part of the eCluster project. Each subject group discusses the added value of eLearning and devises teaching sequences for its own subject.

Teachers have achieved varying levels of proficiency in the use of ICT. All teachers in the German, English, Mathematics, Art, Biology and Environmental Science, History and Physics have been shown, through materials prepared for the lower school model particular to the school, how a pupil-focused lesson can be conducted with digital work sheets and assignments that lead to independent learning. In so doing the teacher assumes the role of adviser and helper during learning. Experienced teachers demonstrate use of these materials to their inexperienced colleagues as part of in-house CPD.

At the start the effort for teachers is substantially greater than in normal lessons. When prepared materials are re-used and exchanged the effort is reduced.

School development is promoted and partnered by the Federal Ministry with the eLearning Cluster, notebook class and eContent projects for schools.

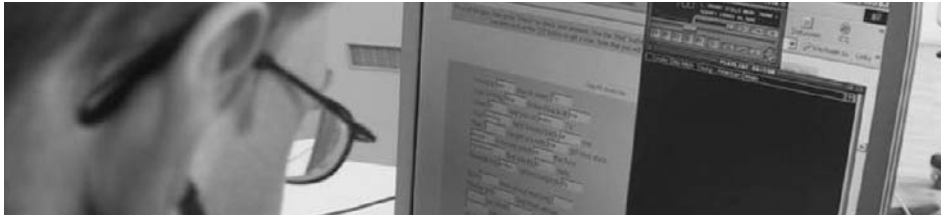
Teachers newly appointed to the school are required to have thorough knowledge in the field of ICT and readiness to use it in lessons. Where possible the only new appointees are teachers who have a thorough knowledge of ICT and who are also ready to use it.

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4 Organisational changes

Current pragmatic structures are the lower school ICT model particular to the school, the notebook classes, obligatory portfolio assignments for all pupils, ICT courses for Classes 3 and 4, and the obligation for the school that all pupils should experience teaching sequences at the computer.

The planned measures have been prepared and addressed, they will be evaluated and improved. Quality developments are being targeted and worked towards using the prevailing opportunities.



A steering group has been set up for organizational implementation of the ICT plan. Technical and organizational measures are addressed and implemented, training scheduled and carried out and teaching materials produced in various working parties.

Teaching organization is supported by use of the WeLearn platform. Materials for the lesson are made available to pupils there, and they can hand in homework assignments there too. Forums are set up for communication purposes.

The driving forces are the director, the school's administrator, the steering party leader and members of the working parties.

Use of ICT is being evaluated in the school-autonomous lower school model by specified tests. The portfolio assignments produced show the performance of every pupil in the school. The measures are introduced and discussed at parents' evenings for various grades.

The knowledge of pupils in notebook classes and non-notebook classes has been compared in various tests. These tests showed that every pupil in notebook classes possessed basic skills and specialized knowledge in every programme (all have been ECDL-examined). In non-notebook classes, on the other hand, there were pupils with serious gaps in their ICT knowledge. The test provided a similar result in the lower school. Every pupil in the school-autonomous lower school model performed very well in the tests. The Class 4 test also highlighted serious gaps in basic knowledge. When asked, pupils in a Class 1 class said that they very much enjoyed computer work and pupils would like more lessons of this kind.

Use of ICT is stipulated in the school curriculum. The school aims to assure pupils' ICT skills by integrating ICT into every subject and making lessons more interesting, more varied and more motivational.

5 Changes in co-operation with others

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Up-to-date dialogue, as part of the school partnership, incorporating ICT (usually by e-mail) facilitates an uncomplicated exchange of information. It leads to removal of barriers and facilitates communication. An up-to-date homepage saves laborious writing and largely dispenses with distributing letters to parents. Themed parents' evenings on ICT are very well attended and show parents' great interest. The latter desire and even promote the use of ICT in lessons. This is also proved by the enrolment figures, which have risen sharply in recent years. The number of children dropping out after Class 4 has fallen slightly. Pupil numbers have risen from 441 in 1994 to over 908 in the 2003/2004 school year. In other words, the number of pupils has more than doubled in 10 years.

The school community committee, a body consisting of 3 parent representatives, 3 teacher representatives and 3 pupil representatives resolves on school-autonomous measures and school trials and makes important decisions for the school.



Collaboration with other schools takes place as part of the “eLearning Cluster” project. In this case 5 schools have united to exchange findings, materials and information. The “PRO Schloss Wagrain” special association provides a link to the regional economy and supports the school financially.

The Austrian Federal Ministry for Education, Science and Culture provides the school with financial support and organizes events related to the “Notebook classes” and “eLearning Cluster” projects.

6 Reflection and ambitions

In BRG Schloss Wagrain use of ICT is compulsory in various subjects and school grades in the lower school. The obligation has not been imposed on the teachers from outside, but proposed by the teaching staff themselves. The intention has been supported by parents, who wish pupils to acquire ICT skills at school. Although all subject groups rejected a reduction of hours in their own subject in favour of ICT during the school development discussion, teachers have already declared their readiness to obligatorily use ICT in lessons and to teach ICT in conjunction with subject content. ICT skills are being tested. Use of ICT is being demonstrated in portfolio assignments. The introduction of notebook classes has made use of ICT in these classes self-evident. For the remaining upper school classes, an individual programme will be devised within the eLearning Cluster project, in order to assure ICT skills there too. Prepared eLearning sequences should be used.

The measures are being supported by the new curriculum for the AHS upper school, which prescribes (in summary) the following:

In addition to a basic education in Information Technology, Information Technology lessons in Class 5 will assume responsibility for preparing pupils to use IT in other subjects too. The curriculum content is information management using IT (researching, systematization, structuring, processing, networking, presenting); learning organization using IT (use of learning platforms); use of standard software for documentation, publication, presentation, to create spreadsheet and database models; and communication and co-operation with IT.

Practice and strengthening of IT skills are the duty of all the other subjects. This is realized through information management using IT (research, systematization, structuring, processing, networking, presenting information); teaching and lesson organization using IT (promotion of independent acquisition of knowledge, programmes for identifying and equalizing knowledge deficits, for independent examination of the level of knowledge, for adapting the learning speed and degree of difficulty to the pupils, for motivation and taking account of individual interests, requirements and learning progress, for repetition and practise, for securing and transferring knowledge); the use of standard software for documentation, publication and presentation and for spreadsheet and database models; the use of subject-specific software; communicative and co-operative methods of working with IT; producing independent work using IT tools (portfolios). These include research and information processing

using a word processing or presentation programme, generating spreadsheets, performing and analyzing surveys and experiments, designing media, documented communication and co-operation in a foreign language, documentation and presentation of project work, modelling and simulation and subject-specific assignments.

The teachers at BRG Schloss Wagrain have set themselves the following targets:

- 1. Production of teaching materials for the school-autonomous lower school model: for English and Art (Class 2), Mathematics and Biology (Class 3), History and Physics (Class 4), work sheets and teaching sequences have been compiled for the purpose of teaching subject content and ICT content (word processing, presentation, spread sheets, Internet sites).*
- 2. Production of teaching materials for notebook classes.*
- 3. Structured, comprehensive debate within school and cluster: what teaching method added-value does teaching sequences with integrated electronic teaching materials have in comparison to previously tried and tested teaching concepts? Definition of quality standards for eLearning per subject or teaching subject respectively.*
- 4. Trialing and evaluation of teaching sequences for subjects at the school site in the cluster that meet the quality standards for teaching sequences.*
- 5. Structuring and adaptation of the WeLearn learning platform for every class in the school, on which all teaching material is also made available.*
- 6. Adaptation of "FLIPPI" programme for documenting pupils' level of performance in the field of ICT. Determination of teaching aims, linking to teaching materials, entry of learning goals achieved for every pupil, printing out performance level for parents' information.*

Challenges:

the path of ICT integration into every subject and expansion of the notebook classes is impelling more and more teachers to use ICT in teaching. In time there will scarcely be a teacher who will be able to escape this challenge. The "inexperienced" are becoming fewer, yet there is still a few who neither can, nor want to, cope adequately with ICT. The minimum goal is for all teachers to assign work (portfolios) that necessitates the use of ICT.

The functioning of hardware represents another challenge. Despite intensive efforts on the part of custodians, there are always hardware breakdowns, network problems, inadequate Internet performance etc. The computer custodian strives to automate re-establishment of software installations, protect computers from viruses and ensure that pupils use the computers in a proper manner.

7 appreciation

The school's endeavours lie in intensive efforts to integrate ICT into teaching. This is suggested by the teachers themselves in a school development process, prescribed in school-autonomous measures making it obligatory in certain subjects and grades. Integration of ICT into teaching has been achieved automatically by the introduction of notebook classes. In-house CPD measures, discussions in subject groups and with the teachers from other schools are intended to lead to successful use of ICT in teaching. The materials developed by the teachers also help inexperienced colleagues to use ICT. Examples also inspire them to prepare similar materials themselves. There is a group of committed teachers to whom the use of ICT is important; they lead by example and drive forward development. Support from the head of the school and school administration makes a material contribution to the success of the development process.

8 Lessons for others

When interviewed, the head teacher expressed the opinion that a pool of staff which leads to a change in the school is indispensable for such a process, but cannot be transposed at will to other schools. Structural possibilities that are important for schools starting out must be considered. "An example ought not to want to be its reflection", rather it should create standardization that satisfies the bounds of the possible from the resources that it has developed itself from its exemplariness. Genuine innovations take place through people, their qualifications and their vision, not through system administrators who build good structures. The latter are important too, but *a posteriori*. Where a pool of staff is not available, it must be provided. It is more important, more efficient and effective to create the personnel prerequisites first and then the structure, but parallelism is necessary.

The symbiosis of ICT and the subject in question appears to succeed. The benefit for the subject lies in the motivation that stems from ICT, in the illustration of facts using multimedia tools, in the currency and speedy availability of information, in programme interactivity, in the support for communicative and co-operative working methods and the possibility of approaching problems explorationally in simulations. This is how ICT skills are established and secured.

Good teaching materials that promote original, independent work, are necessary. They should not only convey subject content, but also ICT knowledge and abilities. The latter are achieved through digital worksheets using standard software, and by pupils creating a product portfolio.

Structural framework conditions (fixed scheduling of lessons in the ICT suite, notebook classes, annual testing of ICT knowledge with specified tests, obligatory portfolio assignments, agreements analogous to eCluster, steering and working parties) help to make the vision a reality.