ICT Action School Development at Helen Parkhurst Dalton School

Summary. The paper presents the progress of the action plan for the improvement of the ICT usage at the Helen Parkhurst Dalton School for secondary education in the Netherlands. At the start of the described action period in 2007, the ICT-usage in education was assessed through a review performed by a group of European inspectors. This assessment formed the basis for a continuous development in the school for promoting and improving the usage of ICT to improve the effectiveness of education. We did this by addressing the observed weaknesses with special measures, and continuing the action plans which were already put in place.

We kept loyal to our starting point that technology use has to be determined through a strong **vision** of education and not that technology determines our philosophy as is sometimes the case. It was determined that the curriculum that should drive the learning, not the technology.

In 2009 we carried out an intermediate self-evaluation. We established a new vision for school development for the near future. In this vision there was much room for a growing role of ICT usage. Concrete plans for the future were made. In this paper, the third in a row, we will try to assess the full impact of this implementation for teachers, learners and the quality of the teaching and learning process by comparing the assessment of 2007 with a self evaluation on the same indicators in 2011.

Key words: *Integration of ICT, secondary education, quality, policy, teacher, evaluation, management, pedagogy*

INTRODUCTION

Fig. 1 The Helen Parkhurst Dalton School

Helen Parkhurst Dalton School (see figure 1) is located in Almere, in Dutch New Land, and was founded only 13 years ago. It is a school for the general secondary education of students between the ages of 12 to 18 years. All streams are preparing for intermediate and higher vocational education and university. The school concept is based on the Dalton Educational System, which is based on three principles:

(1) Responsibility and accountability,

(2) Independence and reflection, and

(3) Building relationships and collaboration.

In daily practice these principles are translated into the following. The objectives for 6 (young students) to 12 weeks (older students) are fixed through so called 'curriculum lines' by the teachers in the different subjects. But the order of activities, pace, and to some extent the way to reach the objectives can be determined by the students themselves, in close agreement with the teacher. Many learning activities are based on collaboration with other students. Important are metacognitive skills such as reflection on the different activities and the results of the learning process in relation to collaborative and planning skills.

In the 10 years of its existence, the school's population has grown from 360 to about 2100 students, divided across five departments: Archimedes (A), Copernicus (C), Dante (D), Einstein (E) and Villa Parkhurst, VP. The four departments A, C, D and E are housed in a new modern building; the VP department is housed in more informal housing. Two departments prepare for access to intermediate vocational education, one department has an emphasis on culture and arts, one department on economics and one department provides extra challenges for students that are performing well in science. There are special facilities for top sports.

Every department has its own head of department, educational e-coach, curriculum developers, and counselors for pupils as well as professional coaches for teachers. Each team consists of about 40 people: teachers, educational assistants and administrative personal. There is one central ICT-coordinator.

The start of the action school development

In September 2007 an assessment on ICT in education took place at the school through an inspectorate visit, using the European Framework for the Evaluation of ICT in Education by van Oel et al. (2008) [1]. The results of this assessment were extensively described in the first paper on ICT action school development by Hogenbirk and van de Braak (2008). We present here the assessment of the indicators within the framework of van Oel et al (2008).
See Table 1.

Leadership	**Score**
C1.1There is a clear vision for the use of ICT	0|1|2|**3**|4
C1.2 There is a strategy to realize the vision	0|1|2|**3**|4
Infrastructure and access	Score
C2.1 The available resources reflect the needs and vision of the school	0|1|2|**3**|4
C2.2 The deployment of ICT resources enables efficient use of them	0|1|2|3|**4**
C2.3 Support systems optimize the use of ICT	0|1|2|3|**4**
Curriculum planning	Score
C3.1 Meeting local, regional and national requirements	0|1|2|**3**|4
C3.2 Coherence, balance and consistency	0|1|**2**|3|4
C3.3 New developments in ICT and pedagogy	0|**1**|2|3|4
Quality assurance and improvement	Score
C4.1 Review and self-evaluation of ICT policy and practice	0|1|2|**3**|4

C4.2 Action planning and implementation	0|1|2|**3**|4
C4.3 Action monitoring and revision	0|1|**2**|3|4
Pupil use	Score
U1.1 Development of ICT skills	0|1|2|3|**4**
U1.2 Enhancement of learning	0|1|2|**3**|4
The teaching process	Score
U2.1 Developing pupils' ICT capabilities	0|1|2|**3**|4
U2.2 Use of ICT to enhance teaching	0|1|**2**|3|4
U2.3 Teaching staff competence and confidence	**0**|1|2|3|4
Administrative use	Score
U3.1 Identifying issues impacting learning and teaching	0|1|2|**3**|4
U3.2 Communication is supported.	0|1|2|3|**4**
Impact on learning and standards	Score
O1.1 Gains in broad learner achievement	0|1|**2**|3|4
O1.2 Effects of ICT use on pupil attainment	**0**|1|2|3|4

Table 1. ICT Assessment September 2007, Indicators for ICT Quality

The European framework consists of three main themes: Conditions (C1 to C4), Use (U1 to U3) and Outcomes (O1). There are a number of quality areas within each theme, eight in total. Quality indicators with corresponding evidence pointers are identified within each quality area. The assessment consists of indicators with the values 0 or 1 to 4.

Their meaning is:

0. No evidence available or not relevant.
1. Bad - There is hardly any positive evidence.
2. Insufficient - There is not enough positive evidence.
3. Sufficient - There is enough positive evidence but improvement is possible.
4. Good - Most or all evidence for a particular indicator is positive.

Four main points of criticism identified by the assessment team were addressed:

1. The coherence in the ICT policy
2. The effectiveness of the use of ICT in teaching
3. The measurement of gains in learner achievement through ICT and
4. New ICT developments.

Each of these points of criticism was designed to ensure that ICT was used effectively in terms of policy compliance, teaching effectiveness, learner achievement and keeping up to date with new developments in technology. In a sense, it was to improve the overall quality of student's

education that technology was to be used and it was only a matter of good practice that we ensured that our investment in technology was justified in all its aspects.
For these main points of criticism the following measures were taken.

- The coherence in the ICT use was improved by appointing school wide operating coordinators on ICT, coaching, quality assurance and professional development.
- The use of ICT in teaching was encouraged by offering a variety of teacher training and dedicated workshops.
- The measurement of gains in learner achievement through ICT use was addressed by a comparative study on the effects of ICT in international learners collaboration.
- The perspective on new ICT developments in ICT and pedagogy was broadened by purchasing new equipment, for example: interactive white boards, laptop trolleys and other digital devices and by realizing new ICT-laboratories.

The second phase of the action school development

After the initial visit, the Helen Parkhurst Dalton School continued its development in using ICT to improve the educational process. In the second paper by Hogenbirk and van de Braak (2009) the actions carried out in the school years 2007- 2009 were described.
In this period the following objectives were realized:

- More infrastructure was made available.
- Good ICT-practices were supported by participating in the national Grassroots project.
- A research project on ICT effectiveness in international collaborative projects was developed.
- New studios for music and art were built with all kinds of digital equipment.
- The Digital Learning Environment was further developed.

More important in this period was the development of a long term vision and strategy for the school for the near future. At first we organised a so called ‘scenario debate’, a more or less free brainstorm about the desired, most profitable and most effective image of the future education to be imparted at the school. As an aspirant Pathfinder School a visit to the working conference for Microsoft pathfinder and mentor schools in Seattle (December 2008) brought a breakthrough in practical ideas and the way forward.
With respect to the educational use of ICT we determined the following actions:

- Further and advanced educational use;
- More assignments on the DLE (Digital learning Environment);
- Pilots on digital testing;
- Setting up a web portal for more parental involvement;
- Use of ICT for tracking learners;
- A next round of vouchers for voluntary teacher training;
- The introduction of netbooks for all teachers.

Progress was made and reported on in January 2009 in the paper on the action school development part II by Hogenbirk and van de Braak (2009).

The third phase of the action school development

After the ‘scenario debate’ the third phase of development started. Actually this phase is particularly described in this paper. In this phase a concrete so called ‘school plan’ was developed where issues like general vision on Dalton education, pupils coaching, teacher development and finances were addressed. Teachers, pupils and parents were involved in this process in working groups. In the period January – April 2009 the School Plan was formalised and agreed upon by the Management and later by the Participation Council of the school.

Dalton 3.0

In the spring of 2009 an amazing idea was born: the project called Dalton 3.0. As the project was set up as a pilot only the forms in one Department (VP) were involved. The project consisted of three elements:

1. Netbooks for all pupils in the first form of secondary education.
2. Arranging digital learning materials in all subjects taught in the first form by the regular teachers.
3. The introduction of a digital portfolio.

The first element concerns the netbooks. These small laptops are provided by the school but (partially) paid for by the pupil's parents within a hire-purchase system. So the pupils are responsible for a device which is actually their own property. This results in a very low incidence of damage and loss. Pupils are also allowed to take the netbook home to complete their homework on it, and also to charge them overnight. At school they can have support and the netbooks are also delivered complete with all necessary software including wireless internet.

The second element, the arrangement of the digital learning materials, is the major challenge. Specifically chosen teachers were put together in small teams where they developed digital assignments, working sheets, internet web quests, etc. They were also encouraged not to develop these themselves but to *arrange* usable digital materials already available on the internet. An important source for these materials is the website of the Dutch national educational ICT provider Kennisnet (http://digitaalleermateriaal.kennisnet.nl/, in Dutch).

The third element of Dalton 3.0 is the introduction of a digital portfolio for pupils. The purpose of this portfolio is to have a working space for the pupils. They are the "owners" of the content of the portfolio and responsible for it. A portfolio contains the results of assignments, the burden of proof for their assessment, their self-reflection on the learning process and learning achievements and the feedback from their teachers. Also, the parents are able to give feedback on the reflections of their kids.

In school year 2010-2011 the pilot phase of Dalton 3.0 has been broadened to the second year in department VP and to the first year in one other department, Einstein. In November 2010 we decided to broaden the project to the lower classes in all of the school beginning with the following school year.

In October 2010 we received funding for conducting extensive research on the differences between using a portfolio within a digital environment and a kind of written portfolio. The research design is set up by the University of Utrecht, using pre- and post measurements, and using control groups within the school.

Other activities

As a start for the intended roll out of Dalton 3.0 we introduced a new Digital Learning Environment throughout the school year for the whole school. The DLE we used before was no longer suitable, as a short evaluation among the teachers had proved. A programme of teacher training was organized.

In order to implement an exercise of arranging digital lesson materials we got an amount of money from the local authorities for setting up an ICT Studio. This is a classroom inside the school, merely for the teachers, fully equipped with the latest ICT devices, including a video communicating system. In this ICT Studio we will train the teachers, provide courses to improve the competence to arrange digital materials, give room to working groups of developing teachers

and hold workshops and seminars for teachers from other schools. The council of parents has provided a budget at the grassroots for improving teaching methods.

The department, Dante, with the Cultural Program, started using Mac books in the lower classes. They considered the netbooks as insufficiently capable of serving their needs in assignments with multimedia.

In the Department, Copernicus, a key issue is the development of collaborative international projects. It goes without saying that these projects do use ICT intensively.

The Department Archimedes has been working on the introduction of a natural and technical science stream. Here the use of robotics is one of the areas of development.

In October 2010 Helen Parkhurst became officially the Dutch Microsoft Pathfinder School for Secondary Education [2]. This status gives us the opportunity to reflect on what we do with other leading schools around the world.

Communication with the outside world is improved by constructing a new website (www.helenpark.nl, made and developed by one of the older students), by implementing a monthly digital newsletter and by giving parents view of pupils' results in a web portal.

The school intranet has been renewed by installing Sharepoint as a tool for teacher information and collaboration.

Evaluation in 2009

Since 2009 a lot of progress has been made with respect to the usage of ICT in education. The introduction of pupils' netbooks in the classroom and of the new Digital Learning Environment has facilitated the integral use of digital media in almost all school subjects. Moreover it has improved the organization of the development of meta-cognitive skills. Ongoing research has to show whether this organizational set up does have a positive effect on the quality of reflective skills, as this is a main objective of Dalton education.

In Action School Development Part II (Hogenbirk and van de Braak, 2009) we looked back at the assessment through the inspectorate's framework. We concluded that the following indicators did improve:

- C3.2, the coherence between ICT development had increased;
- C3.3, some new developments had been investigated and promoted;
- C4.3, action monitoring was in place with regular assessments;
- U2.2, the enhancement of teaching still needed improvement;
- O1.1 and 1.2, some small-scale attempts had been made to measure the impact.

Evaluation in 2011

In this third paper on ICT action school development we compare the original assessment with the state of ICT usage in the teaching and learning in 2011. We present the different indicators with a self-assessment and comment briefly on each of them. Changes are marked in Italics.

Leadership	**Score**
C1.1There is a clear vision for the use of ICT	*0|1|2|3|**4***
C1.2 There is a strategy to realize the vision	*0|1|2|3|**4***

Table 2. ICT Assessment February 2011, indicators on leadership

We organized the debate on the future and developed a School Plan in which the vision and strategy have been formalized. A dedicated meeting has been set up for the ICT vision in collaboration with the Dutch national ICT network Kennisnet. The strategy has been translated into concrete yearly action plans. We think these indicators deserve a better score compared to 2007.

Infrastructure and access	**Score**
C2.1 The available resources reflect the needs and vision of the school	0|1|2|**3**|4
C2.2 The deployment of ICT resources enables efficient use of them	*0|1|2|**3**|4*
C2.3 Support systems optimize the use of ICT	0|1|2|3|**4**

Table 3. ICT Assessment February 2011, Indicators on infrastructure and access

According to the law of supply and demand we see that the need for more ICT is not diminishing but rather is growing. That effect is noticeable in three areas:

- The need for more computers for pupil access in the higher forms;
- The need for more smart boards for demonstrational purposes by teachers;
- The demand for more hardware for more sophisticated use of ICT application like multimedia and construction tools.

We therefore changed indicator C2.2 into a bold "3". The support however is assessed as good and sufficient by most teachers and learners (C2.3).

Curriculum planning	**Score**
C3.1 Meeting local, regional and national requirements	0|1|2|**3**|4
C3.2 Coherence, balance and consistency	0|1|**2**|3|4
C3.3 New developments in ICT and pedagogy	*0|1|2|**3**|4*

Table 4. ICT Assessment February 2011, Indicators on curriculum planning

We have not put much effort into national pilots for digital examinations, but we are a forerunner in local and regional networks (C3.1). The coherence between the departments is a continuous point of concern. The balance in vision, infrastructure, digital learning materials and teacher competences is the main issue to work on. To force ourselves to pay as much attention to this balance we maintain the score on C3.2 on a stimulating "2". In the lower forms much progress has been made with respect to the pedagogical use of ICT. So we think we deserve a better assessment on indicator C3.3 compared to 2007.

Quality assurance and improvement	**Score**
C4.1 Review and self-evaluation of ICT policy and practice	0|1|2|**3**|4
C4.2 Action planning and implementation	0|1|2|**3**|4
C4.3 Action monitoring and revision	*0|1|2|**3**|4*

Table 5. ICT Assessment February 2011, Indicators on quality assurance and improvement

We have put much effort into action planning, especially in the introduction of the Dalton 3.0 project and the implementation of all attached renewals attached. We carefully considered the effects on, and satisfaction of teachers, pupils and parents, before deciding to broaden the first pilot to a second department, and before deciding upon broadening the project to the whole school. One could imagine that the way to perform these evaluations could be conducted more regularly and a little more professionally. The score therefore is not "excellent".

Pupil use	**Score**
U1.1 Development of ICT skills	*0|1|2|**3**|4*
U1.2 Enhancement of learning	0|1|2|**3**|4

Table 6. ICT Assessment February 2011, Indicators on pupil use

We are still not satisfied with the continuous curriculum lines for ICT skills. While most pupils are rather skilled in just using simple applications and the social media, they are not very well prepared where more complex ICT tasks and ethical issues of ICT use are concerned. There is still work to do to allot these kinds of objectives to the different disciplines and within the different learner tasks.

In the lower forms the learning process is well supported by ICT. This is especially reflected in the way pupils reflect upon their learning behavior. In the higher forms this effect is much less noticeable.

The teaching process	**Score**
U2.1 Developing pupils' ICT capabilities	0|1|2|**3**|4
U2.2 Use of ICT to enhance teaching	*0|1|2|**3**|4*
U2.3 Teaching staff competence and confidence	*0|1|2|**3**|4*

Table 7. ICT Assessment February 2011, Indicators on the teaching process

The same considerations are valid for the use of ICT in the teaching process as they are for the enhancement of learning. In the lower forms most teachers are impressively developing their ICT teaching skills. At the higher forms they are still a little laid back. On the whole the improvement of teachers' ICT competencies is enormous and fascinating. The introduction of the ICT studio will help to develop teachers with respect to their arranging skills.

Administrative use	**Score**
U3.1 Identifying issues impacting learning and teaching	0|1|2|**3**|4
U3.2 Communication is supported.	0|1|2|3|**4**

Table 8. ICT Assessment February 2011, Indicators on administrative use

We are the first school in the region to implement a clear and usable combination of components for ICT support systems. In these systems the different educational stakeholders all have their specific places and individual responsibility. The website has been renewed and the developments and daily issues in the schools are communicated by a digital newsletter for parents and teachers. So we maintain the scores from 2007 on the indicators U3.1 and U3.2.

Impact on learning and standards	**Score**
O1.1 Gains in broad learner achievement	0|1|**2**|3|4
O1.2 Effects of ICT use on pupil attainment	*0|1|**2**|3|4*

Table 9. ICT Assessment February 2011, Indicators on learning and standards

In a small-scale research project we proved minor positive results of using ICT for international collaborative projects. The broad scale running research on the introduction of the digital portfolio gives much evidence for positive effects of ICT on pupils' attainment. So this remains a work in progress....

CONCLUSION

We are still in a continuous process in the development and implementation of effective ICT use in education. It is hardly a question that we should introduce ICT usage on a broad scale in the school. There is some resistance among teachers and parents, mainly because of the fear that the personal interaction between teacher and students will be negatively influenced by continuous availability of computers in lessons.

The major challenge in the next years will be to seek the balance between teacher and student-centered education, between formal and informal learning, between individual and collaborative learning and between ICT poor and ICT enriched learning environments. A major effort will be to include research on the learning effects.

Technology has certainly played a role in streamlining our vision of the learning that takes place in the school. It has also brought about more independence and responsibility on the part of students. More focus on issues of ethics and critical analysis and less time spent on social media needs to be implemented in the school. Nevertheless, through our research, we have clearly demonstrated that when educators take charge of technology and direct it towards improving student knowledge and responsibility, progress of student performance is improved, rather than having technology being "wasted away" with simple student socializing.

NOTES

[1] The original European Framework for the Evaluation of ICT in Education was developed by the contribution of: Guy Ménant, Mireille Golaszewski, Michel Perez, Sven Borg, Peter Ekborg, Ken Dyson, Pádraig Mac Fhlannchadha, Iain Lowson, Wray Bodys, Kenneth Muir, Martin Uunk, Pieter Hogenbirk, Ferry de Rijcke and edited by Bert Jaap van Oel, the Netherlands

[2] The Partners In Learning Program is sponsored by Microsoft and is aimed at new ways of teaching and learning by the net-generation. The Dutch site is: http://www.microsoft.com/netherlands/onderwijs/pil/default.aspx.

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