

Students' Voices research Young people's views on ICT

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Quite a bit of research is carried out into young people and the way they use ICT. In many cases such research is aimed at getting a general idea of the kinds of media they use and the amount of time they spend on it. But usually the researchers do not take the opportunity to ask those young people themselves about their experiences with ICT, especially with regard to learning. How, based on those experiences, they view the use of ICT when doing homework, and what their expectations are regarding the use of ICT in school. Therefore, in the past few months, research has been carried out in Australia¹ and the Netherlands –with support from Kennisnet- into the expectations and experiences of students, pupils and young, starting teachers regarding learning with ICT in education. This article presents the most important findings of that research.

More attention for young people

Worldwide, various movements and developments can be identified that create a more beneficial climate for research into the views of young people about the use of ICT with learning.

It is quite clear by now that we are dealing worldwide with new generations of young people for whom the internet and multimedia have become indispensable tools in their daily lives. Part of their activities take place in the virtual world, with various environments, such as those of communication, entertainment and fun, and information. It would therefore seem to be increasingly easy to reach young people via the internet or mobile phone, also when it comes to learning. But is that really the case? Or are young people perhaps becoming more selective, because of the abundance of available media? Or do they have their own ideas about which media are more suitable for specific purposes, such as learning?

In recent years several publications have been dedicated to these generations of young people (*Yearbook [Social and Cultural Planning Office] ICT and Society 2006: The Digital Generation, Jos de Haan and Christian van 't Hof (ed.), Educating the Net Generation [Educause 2005], Diane and Jame Oblinger (ed.), Young people and their digital world. What teachers and parents should know (Van Gorkum 2006), Guus Wijngaards, Jos Fransen, Pieter Swager*). These studies attribute all kinds of skills and qualities to those young people: new technologies are an integral part of their lives, they are online virtually all the time, they like new challenges and experiences, they expect things to be taken care of fast, and preferably right away, they dislike texts but do like visualisations and they prefer to keep in touch with their peers online. Furthermore it is said they are fascinated with socially important subjects. As far as learning and teaching are concerned this would mean, amongst other things, that there should be more focus on cooperative learning (peer-to-peer learning, interaction and engagement), on learning that is visual and dynamic (images, movement, and spatial relationships), and on meaningful matters (socially relevant, problem-solving contexts for learning).

¹ The research in Australia was led by Dr. Kathryn Moyle, Associate Professor with the Faculty of Education of the University of Canberra and Director of the Secretariat for the Australian ICT in Education Committee.

It would appear important to compare these ideas with the ideas of young people themselves as much as possible.

The tempestuous, ceaseless developments in ICT now make it possible to personalise learning. Young people cannot all be lumped together, and like the individuals of all previous generations they differ considerably (which is a good thing). Modern media allow for custom-made education and learning processes, adapted to the individual. This provides young people with a perfect opportunity to see that their role in education is taken seriously and that they are no longer treated as 'subjects' but as 'citizens':

It is not unreasonable to argue that personalising learning moves students from being subjects to citizens. As citizens they have an entitlement to be direct participants rather than have token consultation. If personalising learning is to go beyond paying lip-service to a greater focus on the individual then students have to become active protagonists in the design and delivery of their learning (National College for School Leadership, UK).

Internationally there seems to be a growing number of initiatives to give young people their own voice. Examples of these include Project Tomorrow (www.tomorrow.org) and the Sound Out project in the United States, aimed at giving pupils a voice through research, training and information sharing. The Research Informed Practice Site of the Department for Children, Schools and Families in the United Kingdom which has a special theme about Pupil Voice research (http://www.standards.dfes.gov.uk/research/themes/pupil_voice/) and the Canadian SpeakUp Initiative has invited some sixty young people to take part in a departmental youth advisory committee. So we too should put our ear to the ground...

Research method

The Students' Voices research in the Netherlands is carried out by the INHolland eLearning Centre² –with support from Kennisnet. In order to facilitate comparisons between the Australian and the Dutch situation, it was agreed to do research in the same way as much as possible. It was decided to gather research data in two ways:

1. By means of quantitative research into the experiences of pupils, students and young, starting teachers with ICT, both within and outside education, and into their expectations and ideas regarding the use of ICT with learning. Data were gathered using online questionnaires, adapted to the various target groups. They were published and filled out on the Zoomerang website, www.zoomerang.com. The Dutch and Australian questionnaires were virtually identical; the only differences were the result of translation, and the mention of a few websites, such as the mention of Hyves as a social networking site for the Dutch situation. In the Netherlands a total of over 2000 questionnaires were filled out, divided amongst the target groups as follows: primary education (PE): 230, secondary education (SE): 465, vocational education (VE): 998, teacher training (TT) 308 and young teachers (YT): 117.
2. By means of qualitative research through so-called focus groups, using Zing systems. A Zing session requires special hardware and software. The software used is called ZingThing and runs on a computer (both Windows and Mac, via Java). The hardware consists of a number of wireless keyboards that form a small network and are connected to the computer with USB dongles. A beamer projects the input of the participants on a screen or wall. Each participant can pass his or her own answers to the computer, which in turn makes all contributions visible on the projected screen. This enables discussion of each other's answers. All input is stored right away.

² www.inholland.nl/elearning. Researchers: Jeroen Bottema, Hans van Eerden, Jos Fransen, Pieter Swager

It was explained in advance that the term ICT should be interpreted as broadly as possible: computers, the internet, games, social networking sites and multimedia such as mobile phones, digital cameras, camcorders and interactive blackboards.

The main results of the research in the Netherlands

The full research report can be found on the Students' Voices website of the INHolland University eLearning Centre. This article will at times expand on specific results, but its main focus is on what appear to be general trends and developments.

Mobile phone

The participating pupils, students, teachers in training and young, starting teachers all use ICT extensively. The focus is on mobile phones and the internet. Virtually all have their own mobile phone, except for the pupils in primary education, just over half of whom indicate they have their own phone. Remarkably, 18% of the PE pupils indicate they use their phone for all kinds of things, except for calling. It remains unclear whether this is the result of a lack of money for this form of communication or a conscious choice. The most popular functions of mobiles, apart from calling, are text messaging (mainly SE and VE), playing games (almost three quarters of PE and over half of SE pupils), taking pictures, listening to music and making videos. In all target groups a minority also use their phone for e-mailing, downloading music, listening to the radio, watching TV, navigation (GPS) and storing data and files. Young, starting teachers (YT) and teachers in training (TT) mainly use their phones for text messaging, taking pictures and listening to music –apart from calling.

From this we may conclude that virtually all people over twelve years of age have a mobile phone, that mobile technology offers an ever increasing number of functions and that those functions are actually being used extensively by all target groups. This might offer opportunities for the use of mobile technology in education in the near future, provided education is properly prepared and adapted for it.

Internet

The internet is used extensively in almost all target groups, mainly for finding information and all sorts of activities on a personal level. In this respect, the multimedia nature of the internet plays an important role, which is clear from the great interest in media sites. Pupils and students are also very active on social networking sites, with a clear peak amongst pupils in SE. The days when the internet was mainly used as a source of information are clearly over, and interaction has become a key aspect.

Teachers in training and young, starting teachers are of course also active on the internet. Both groups use the internet to find information, but when it comes to the other activities there are clear distinctions between young, starting teachers and teachers in training. Teachers in training play more online games, use social networking sites more, work with media sites more, chat more with friends and family and download more music. Young, starting teachers, on the other hand, download more media like movies and books and use Google Earth more.

We can conclude that the internet is playing an ever more important part in the lives of pupils and students, and that the possibilities the internet has to offer for information sharing and interaction are growing exponentially. It would be a shame if these possibilities were used insufficiently in education, especially since it is becoming clear that the present generation of teachers in training, who are on the verge of entering their profession, use the possibilities the internet has to offer extensively. This demands reconsideration of the possibilities this offers for the redesign of learning practices, but it also requires that we research what conditions have to be met in education, in order to allow for optimal use of those possibilities in the future.

Social software

Remarkably, a vast majority of all target groups indicate they are interested or even very interested in using social networking sites like Hyves, and even more in photo and movie sites like YouTube

and Flickr. The most popular chat sites are MSN, Hyves and Windows Live. Clearly, MSN is still the most popular site for chatting, but Hyves and Windows Live are scoring rather well too.

Roughly three quarters of all pupils feel that sites like Hyves and chatting are mainly intended for fun, and not for learning things. But it should be noted that a considerable number of students from SE and VE feel that these sites are not only intended for use at home, but equally for use in school. Regarding media sites like Flickr and YouTube, a clear majority of students in SE and VE do think they can learn things from these sites, and that they should therefore also be used in school. Teachers in training and young, starting teachers also see possibilities for the use of media sites in education. As far as the use of social networking sites is concerned, opinions amongst members of these target groups are more varied.

We can conclude that it is impossible to paint an unambiguous picture of the possibilities of particularly social networking sites in education and that opinions vary widely amongst the target groups that were questioned. Especially pupils and students feel that these personal environments in particular should not be mixed with learning in school, which could be explained from the two perspectives. It is all about the locus of control, for the personal environment is controlled by the owner of that environment, whereas in education pupils and students tend to put the locus of control with the teaching institute and the teachers. As long as we are insufficiently capable of designing education in such a way that students feel they are co-owners of their own learning process, chances remain slim that personal environments will be used in regular learning. Presently there is still a clear distinction between the formal learning environment and the personal environment, and only if we succeed in building a bridge between these two worlds when redesigning education, a successful link can be realised between the virtual environments that are part of those worlds.

Games

Pupils in primary and secondary education play a lot of (online) games, and in the future those numbers will probably only grow, considering the economic growth in this sector. It cannot be denied that pupils and students spend a lot of time playing games and develop numerous different activities while doing so. And it no longer holds true that it is mainly boys, for there is an almost equally large group of girls who play games. Pupils and students indicate that (online) gaming primarily appeals to them because of the fun and social interaction, but they say they also learn all sorts of things from it.

Teachers in training and young, starting teachers play less (online) games, but it is to be expected that those numbers will increase when the next generation enters higher education. Teachers are divided concerning the learning benefits of games, but they do think that games may make learning more appealing.

To find out what sorts of games are most popular amongst the various target groups, a number of genres were distinguished: action, sports, racing, role playing, strategy and flight simulation. Participants could also name other types of games. Action games appeal to a vast majority of pupils in primary and secondary education, and to just under half the students in vocational education. Sports games are mainly popular with pupils in PE, and considerably less so in SE and VE. The same goes for racing. Role playing games, on the other hand, are appreciated more amongst pupils in SE. When it comes to strategy games, such as Age of Empires, there is little difference between the target groups (approximately 40%). Flight simulation is clearly one of the less popular genres, but it appeals most to pupils in PE (29%).

When respondents are asked if they are interested in other types of games, outside the ones already mentioned, or in specific games, a deluge of game titles is the result.

What do you learn from (online) gaming? Pupils in secondary education have the highest expectations when it comes to '*hand-eye coordination*' (56%), '*learning to make decisions*' (40%),

'learning to concentrate' (35%), 'learning to cooperate' (43%), 'learning to solve problems' (32%) and 'learning to deal with other people' (34%). They also firmly believe that schools should make more use of games in education. Especially pupils in SE think so, because games make learning more fun for pupils. There is, however, also some criticism, as games distract from the learning process.

We can conclude that (online) gaming has become increasingly important, but that opinions regarding the possible value of games in education still vary. Many teachers consider the simple assumption that learning becomes more appealing with the help of games insufficient reason to use games in education. And many pupils somehow feel that fun and learning should not be mixed. Games are currently mainly used for drill & practice applications, particularly in primary education, where it is a simple way to offer some fun learning to pupils, while at the same time the demand for personalisation can be met. Undoubtedly, other types of games could have some added value in education, but apparently teachers lack knowledge about the existence of such games, as well as insight and experience regarding the way those games could be integrated in a didactic design. There might be ample room for improvement in this respect.

ICT in school and with learning

This research showed once again that 'frontal' (chalk 'n talk) lecturing is still the main form of education at all levels, but particularly in secondary education. This way of designing learning practices, with the accompanying division of roles between teacher and learner, does not combine well with the many new possibilities ICT has to offer for learning and the design and support of learning processes. This becomes apparent from the results of this exploratory research, as the vast majority of the participating pupils and students indicate they use ICT mainly at home, for self-study, making assignments and doing their homework.

On the other hand, pupils and students do feel they '*work with computers quite often*': PE = 49%, SE = 40%, VE = 48%. In secondary education, over a third of the pupils never use a computer in the classroom, but only in special computer rooms. In primary education it is just the other way around. As pupils grow older, they use the internet more often when in school, especially in the computer rooms of secondary schools: 71% (every day or once or twice a week) and VE: 74%. In primary schools it is (in the classroom) 39% and (in a computer room) 16%.

Over half the teachers in training feel that there is sufficient time to work with computers and the internet while in school, and that the internet connection is fast enough. So it would appear that the present infrastructure is not a bottleneck limiting the use of ICT in learning practices in school. There is, however, some concern over the ICT-skills of teachers, especially amongst the pupils and students, and this would appear to be a far more important reason why ICT is still playing only a minor role in the didactic design of learning practices.

We may conclude that there is still a long way to go before an integrated use of ICT in learning practices in regular education is realised. This integration might be sped up by enhancing the ICT-skills of teachers and the arrival of young teachers with good ICT-skills. But the experiences of teachers in training during their teaching practice indicate chances remain that those new skills will remain unused, as many schools are not yet equipped for it. Naturally, this can lead to regression to the tradition of 'frontal' lecturing, and apparently this is still the prevailing practice in current education.

Motivation

About half the pupils indicate that learning usually or always becomes more fun when ICT is involved, but far too little time and space is allocated to ICT in school. Things are different for VE, where there is more than enough time to use ICT in school, but there too ICT is still insufficiently integrated in a didactic approach. Teachers in training furthermore indicate that in their experience children in their practice schools appreciate the use of ICT, but that their good intentions often founder on the lack of time and technical support that are necessary to make the use of ICT

successful. They also note that as for now, most of their mentors have insufficient ICT-skills, and that they do not expect much support from their mentors as far as a vision on the use of ICT with learning is concerned.

The problem of the inadequate use of ICT can in large part be explained from the conditions that presently still apply within regular education. These conditions may be summarised as a lack of vision and knowledge amongst teachers about the added value of the use of ICT in learning processes, a lack of ICT-skills with most teachers currently working in education, and a didactic tradition based mainly on frontal lecturing. Obviously, young, starting teachers with the ambition to use ICT optimally in their learning practices must be very sure of themselves in order to realise real change under those conditions, and to maintain their motivation to do so. The implementation of ICT in learning practices is apparently no priority, which can hardly be expected, considering that many teachers lack the skills to use ICT.

Bullying, spam and plagiarism

The numbers concerning cyber bullying cannot be ignored. In primary education those numbers are: 11% (sometimes), 2% (usually) and 4% (always). For secondary education: 20%, 3% and 5%. For vocational education: 5%, 2% and 1%. Although cyber bullying is still a matter of concern, it should also be noted that the majority of pupils feel safe when they are online in school. Pupils and students are generally also satisfied with the software in school, as it usually works fine. They do, however, indicate that they are often not allowed to use the internet in school for finding information, mainly because teachers are concerned with plagiarism and the fact that it is hard to check the authenticity of the information found.

There appears to be ample room for improvement when it comes to 'making arrangements for the use of ICT in school', the knowledge of teachers concerning the use of the internet with learning and fighting plagiarism. More attention should also be paid to learning to deal with the internet and the information found on the internet. This justifies the question whether teachers are capable of achieving this on their own, also considering the fact that pupils and students think their ICT-skills are insufficient.

Homework and learning

As mentioned before, pupils and students use ICT predominantly for doing their homework and making assignments, and a majority of them are convinced that ICT offers added value for those purposes. It should perhaps be concluded that they use the computer more at home than in school, and that pupils are miles ahead of their teachers in this respect. So it is hard for these teachers to help their pupils in school and to instruct and support them.

Pupils and students also use the communication possibilities of the internet to work on assignments and homework together, but also to make presentations and other products they have to hand in. It might be concluded that pupils and students use the communication possibilities of the internet far better than their teachers. The main advantages of ICT the teachers see are the possibilities to support instruction and personalise the learning process, with an emphasis on offering learning content, rather than supervising the learning process.

A considerable number of teachers support their pupils online outside regular classes, and the same goes for classmates, fellow students, friends and acquaintances. The question remains whether it is just individual teachers putting their own ideas into practice, or if this is the result of a didactic vision of the school. It appears doubtful that it is the latter, but this remains to be proven by further research.

ICT-expectations

It is obvious that there is great concern about the ICT-skills of teachers, and this might be the main reason why ICT is still only used moderately within the learning processes in school. A majority of

the respondents feel that a lot needs to be done when it comes to the use of ICT in learning processes, but that nothing or too little is actually being done.

Furthermore, it should be noted that respondents are generally satisfied with the hardware and software available in education, but that there is only very little mention of the didactic vision on the use of ICT in learning processes. A vast majority feel that computers and the internet should be available in the library, computer rooms and other locations for studying. Half of them would like to be able to use active boards/smartboards in the classroom. Virtually all agree that they should have access to the digital learning environment from home, but in practice this is not yet the case.

We may conclude, as has been concluded repeatedly before, that there are reasons to suggest that the integrated use of ICT in learning processes in regular education is still far from being realised, and that there remains a long way to go. Limiting factors include the generally traditional didactic design of learning practices, the lack of knowledge concerning the didactic implementation of ICT, and a lack of skills and expertise to actually realise that didactic implementation.

Results from the focus groups with Zing system

The data collected with the online questionnaires were complemented by answers, examples and suggestions from the focus groups. In these groups Zing systems were used. The number of participants per Zing session varied from six up to ten. The aim was to have two focus group sessions per target group. From January to April 2009 a total of eight focus group sessions with Zing systems were carried out, divided equally amongst the four target groups: PE, SE, VE and TT.

All participants were very positive about their experience with the Zing system: It is innovative, 'not boring' and therefore fun to do. It turns out to be very interesting to see the opinions of the others projected on the screen, during the session. Pupils see it as a sort of synchronous chat. A traditional method with a modern tool.

All participants would recommend Zing for further use. It did, however, become clear that the discussions using this system involved a learning process for the researchers as well. In hindsight, they may at times have operated a bit too carefully and should perhaps have gone a bit deeper into some matters. That way the research might have provided even more insight, particularly regarding the reasons people do what they do, and that way their vision of the future might have materialised more clearly.

Be that as it may, the results from the various focus groups do confirm the data and the general picture that has been painted before, based on the online, quantitative research. As the discussions contain examples of practices and ideas favoured by the participants, the results of the most important topics that were discussed using the Zing system are presented below.

The participants in the focus groups were asked to '*describe one of the most interesting examples of ICT use you have ever come across.*' All sorts of answers were given: 'iPhone' (SE 2), '*controlling technology with your mind, waterslide simulation, laptops in the classroom, EEE PC, downloading music, wireless internet on your mobile, physics simulations*' (SE 4), 'Wii, Nintendo DS, iPod, robot soccer, a tank for your car that makes dirty air clean again, editing photos and movies' (PE), '*how they create a 3D world on TMF, mobile phone in your watch, ordering a meal with a touch screen, calling via satellite*' (VE) and '*smartboard, simulations in science class, games*' (TT).

When asked what forms of ICT they use at home for their study, various tools and software were mentioned, such as: school mail, mobile phone, internet, Blackboard, Google, iPhone, telephone, YouTube and Wikipedia. A pupil from SE mentioned an MP3 player '*for recording sounds and listening to audio books*'. Others mention special '*quiz programmes on the internet*' and a '*site with simulations for biology*'. Remarkably, social networking sites like Hyves and Facebook were not mentioned at all. Most participants hardly get beyond finding information on the internet.

When asked whether technology can help people with learning, everybody agreed that technology can play a positive role in learning. *'It makes learning more interesting'* and *'that motivates you'*. The things that were mentioned most are *practicing on a computer* and *finding information*. But it immediately becomes clear that ICT is not always considered the best tool for learning. Sometimes it is, but sometimes it is not. Positive examples that were mentioned include *'It is easier to concentrate while learning vocabulary when you use an MP3 player or computer'* (SE 4). *'By speaking English with others, over the computer, you can improve your English'* (SE 4). *'On the internet you can find information faster than in books'* (SE 4). But ICT can also distract: *'Because it's much more fun than learning, you often end up doing something else...'* (SE 4). *'BrainTraining is fun'* (PE). *'With simulations it helps you to visualise things'* (SE 4).

When asked how they prefer to study – in general - many pupils indicate that they like to listen to music when they are studying. Pupils from primary education also mention that they like to collaborate with others. The answers show various learning styles: by using computers, reading, working at home with a webcam, consulting others and finding information. SE 4 pupils also show clear differences: *'summarising, reading, quizzing and cramming'* works best for some, but others prefer to make assignments and would *'rather not cram, but just learn by trying things and watching what happens when you push a button...'*

Then the pupils were asked in what ways the school expects them to use ICT. In primary education almost all pupils answered: *'using Word for essays or projects, PowerPoint for presentations, and the internet for finding information and pictures'*. But other answers were given as well: *'RekenWeb.nl (an arithmetic site) and School TV, putting things on the digiboard, using the calculator on the computer'*. Furthermore, the dictionary is used for Dutch classes, Ambrasoft software for arithmetic and Dutch, and a CD-ROM for English.

Students from VE also mention: using the school's intranet, school mail, internet, beamer and laptop. SE 4 mentions the school's digital learning environment. These pupils also have to fill out their timetable on the internet and can find their scores for tests there. For Art and Culture classes cameras are used. In laptop classes they also find information for projects on the internet, make assignments and study for tests. Teachers in training use ICT for their studies in many different ways. In addition from what has already been mentioned above, they also work with digital video and an electronic portfolio.

VE students, by the way, feel that their schools do not, or not sufficiently, prepare them for the use of ICT in their future profession. *'We only learn some basic skills in our first year, like working with Excel, but apart from that we don't really do anything new with computers'*.

'How would you, ideally, use ICT for your school work?' Many answer that *'all pupils should get their own laptop.'* But also *'an entire afternoon for educational games, a built-in DS in your desk, so you can do BrainTraining when you've finished your work'* (PE), *'iPhones for everybody'* (SE), *'a chip in your head, food that provides knowledge, educational games, being able to learn everything online'* (SE 4). The ideas of teachers in training stay a bit closer to their daily practice: *'handing in assignments online, using PowerPoint, your own blog, magnifying experiments on a screen, movies on smartboard'*.

The teacher's role in using ICT was also discussed. The pupils from primary education feel that their *'teachers know far less than we do'* and think they can manage fine without their help. They also help their teacher to use the electronic whiteboard. According to the pupils from SE 4 things are hardly better in their schools, when it comes to the help of teachers. But there are exceptions: one teacher who knows everything about Excel, and teachers who *'refer to great sites with lots of useful information, that can help when studying or doing assignments.'* Conversely, teachers are often helped by pupils, especially when they need to connect hardware (computer, TV, sound system and DVD-player). And pupils inform their teachers of *'useful facts and sites'* too.

What about the use of games or simulations with learning? Most pupils in primary education are positive about the use of computer games. They mention BrainTraining on the DS, for example. But also games to learn typing, arithmetic and topography. One pupil mentions The Sims, if you want to be an architect, or Emergency 3, if you want to be a firefighter. Another pupil mentions the benefits of simulations: *'Sometimes games 'happen' in the real world, and then you will know what to do'*. Some students think that educational games could make classes more interesting. Others feel that games belong in your spare time. But simulations are useful and should be used more often. They should, however, involve *'real events'*. *'Practical skills can also be simulated easily. So that you can experience things beforehand, as it were'*. Most teachers in training clearly agree with this. Simulations and virtual worlds, like Second Life, *'allow pupils to be fully immersed in what they are doing, both at home and in class...'*

And what about the use of Hyves for school work? This question resulted in clear hesitation amongst the students. Particularly amongst the older ones, virtually all of whom have their own profile on Hyves, and are very excited about the site. The general picture shows that they find it a pleasant activity to fill out their profile, react to others and exchange photos. But it is also a world in which they can try out things and play: *'I have several avatars on the web. One of those I use to present myself as I really am, and the others (in games or chats) are somewhat more anonymous...'* Another student: *'I've got Hyves, with a so-called BudddyPoke, which is a sort of virtual me that I can dress up and change to look like me...'* Some students like the idea of having a Hyves profile of their class, but the majority do not think they would like to use such a social networking site in the classroom. *'Hyves should be used for your private life, and not for communication between the school and its students...'*

The teachers in training were also asked what the ICT situation in their practice schools was like. The picture painted by their reactions is largely negative. They used little ICT in their practice schools. Sometimes educational games, language and arithmetic software and digiboard. Most of them complain of malfunctions and unwilling hardware. Only one or two mentioned cyber bullying. It seems that the use of ICT with learning is promoted by their teacher training school, but hardly by the practice schools themselves, since most of the teachers in those schools do not use it themselves. Even though the pupils would love to make use of ICT more.

The students are clear about their expectations concerning how ICT should be used with learning, and offer recommendations to their own schools and schools in general: *'Make lessons more varied, more fun and more challenging. Communicate and organise more clearly (theme books, assignments, et cetera). Provide more computer rooms and more computers, provide faster computers and faster networks!'*

Many questions have been answered, many more will have to be asked; there appears to be sufficient reason to consider serious follow-up research, also to further explore important themes from this research in other countries.

A separate article will present concrete recommendations, based on the results of this research, to schools and teaching institutes to improve the quality of education through adequate use of ICT in learning and teaching situations.

Finally, another article will be published soon, concerning the content, methods and possible research partners in other countries for further Students' Voices research.