Supplementing Textbooks with Computer-Based Resources in the Primary EFL-Classroom

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I wish to express my sincere thanks to Günter Gerngross, who has shared with me some of his extensive hands-on experience and insights. Our conversation[1] about the place of computers in the primary EFL classroom has served to support the statistical information presented in this work.

My thanks also go to Ernst Klett Verlag for their generous gesture of sending me the latest edition of Playway textbooks.

My wish is that this work does not remain in the realm of academic discussion but actually serves to guide and instruct EFL primary teachers in Germany how to make the most of computers at school.

[1] CD-ROM > Interview

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List of terms and abbreviations[2]

CBT……...	Computer-based training: learning by executing special training programs on a computer. Also called computer-aided instruction (CAI).
CMC……...	Computer-mediated communication: exchanging text, images, audio and video via computers.
fat client……. (workstation)	A fully functional computer. Most of the applications are installed and run locally. The network server is only used for authentication, file storage, printing, internet access and other central services.
GUI……. (pronounced "GOO-ee")	Graphical user interface: the way a program interacts using the computer screen.
HCI…….	Human-computer interaction: the design of interactive computer systems and the study of their long-term effects on users.
ICT……..	Information and communications technology: the use of technology to process information and aid communications.
Interface…….	Interaction with a computer using input (keyboard, mouse) and output (screen, printer) devices.
MAP……	Multimedia authoring program: software which lets the user link together objects (such as text, an illustration and a song) to produce an attractive and useful presentation.
new media….	Here, computers and the internet.
thin client….. (terminal)	An input and output station (keyboard, mouse, monitor) connected to a network server which runs the software, data and at least part of the operating system (OS).
WBR……...	Web-based resources: here, using the internet to download and prepare labels, flashcards, worksheets, workbooks, picture dictionaries, games, and so on.
WLAN…….	Wireless local-area network: high-frequency radio waves used for connecting computers to a network instead of wires.

[2] Cf. www.webopedia.com, an online dictionary for computer and internet terms and definitions, 16.06.08

1. Introduction

On the face of it, there seems to be a baffling selection of possibilities to use computers in primary school. After initial research into what can actually be carried out, it has become clear that the best justification for using a certain possibility and not another is its didactic potential as much as its viability. There is still much confusion and disenchantment with integrating computers into school routine. Even when such obstacles as resistance of staff and hardware issues can be removed, it is clear today that computers can help pupils with their studies only as much as the teacher is able to put them into effective use.

As this thesis will show, using computers skillfully and integrating technology meaningfully, no matter what the context is – textbooks, curriculum, *Freiarbeit*, or others – requires long-term skills and teaching strategies which were unavailable at the time most of the teachers today embarked on their current careers. Understandably, many of them are unsure of the benefits of using computers in class. Indeed, in such cases it might be better to avoid the use of computers. Teachers who feel forced to use computers, even when they are not ready to do so, will not deliver better lessons. Or even worse: they risk being stigmatized by the establishment as obstinate and old-fashioned.

Nowadays, there is gradual shedding of the myths of using computers in education. “Nicht jedes Multimedia-Produkt ist Lernen zuträglich, nicht jede Stunde vor dem Rechner automatisch modern” (Mause 2001: 3). In that light, it is important to state that although this work deals with the possibility of supplementing textbooks by using computers, it neither endorses the use of computers in the primary EFL classroom in general nor with textbooks in particular. In fact, as mentioned above, it is an entirely understandable and didactically infallible practice for a teacher not to use computers in that specific context. In short, this work is not about *whether* or *why* supplementing textbooks might be a good idea, but *how* supplementing textbooks with computer-based resources can make didactic sense.

> “The computer should never be used as a substitute for interacting directly with the environment. Children should paint with real paint brushes, dance real dances, and collect real flowers rather than just doing these things on a computer screen” (Adams 1985: 35).

Most reputable educational studies today show that there will never be a direct connection between the use of computers and learning outcomes because learning is mediated through the learning environment and the computer is only one element of that environment (educa.ch 2006: 8-9; Herzig & Grafe 2007: 87-88).[3] ICT-based teaching should always be subordinated to curriculum-based teaching and never the other way around.

On the other hand, many opponents of the use of computers in school take the "either/or mentality," excluding the possibility of working with textbooks (traditional literacy) and computers (visual literacy) side by side (Herzig & Grafe 2007: 87). Basically, both proponents and opponents of the use of ICT in primary school justify their position as a pragmatic reaction to the increasing place technology occupies in children's lives.

> "Wenn Sie aber ein kleines Kind zu oft an den Computer heranlassen, wirkt das wie eine Einstiegsdroge: Sie fixen es geradezu an. So ein Kind wird mit dem Computer irgendwann auch ganz andere Dinge tun… Es genügt aber, wenn Menschen ab sechzehn Jahren damit arbeiten. Wir müssen die Kinder nicht an den Computer heranführen. In meinen Augen ist es wahnwitzig, welche absurden Argumente wir uns ständig aus den Fingern saugen, um die mediale Praxis zu rechtfertigen, die wir heute haben" (Spitzer 2008).

> "Children today are immersed in an overtly visual world of television, computers, and video arcades, which is having a disastrous effect on their abilities to listen, to think in words, and to exercise the 'mind's eye'" (Maguire 1985: 13).

There is a lack of longitudinal evidence which indicates whether adults who in their childhood used computers have today, for example, a higher-than-average income. It had taken scientists decades before the use of tobacco was conclusively connected with higher risks of contracting cancer; the jury is still out when it comes to the effects microwave radiation emitted from cellphones might have on our brain. Personal computers have been around for too short to suggest any cumulative effect their use might have on us as individuals and on our society as a whole.

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[3] Some additional insights into the impact of ICT on learning and teaching could be found at: www.det.wa.edu.au/education/cmis/eval/pd/reading/reading1.htm; www.educationworld.com/a_admin/admin/admin122.shtml; www.lehrer-online.de/kindermedienkonsum.php?sid=490461854691021197214078107825 30, 21.06.2008.

It is certain, though, that the lack of evidence should not be a reason for schools to shun computers completely. As will be shown later, most children in Germany have access to a home computer, and depriving them of such access at school would only mean driving the underprivileged and the socially excluded among them from better job prospects (Möllemann 2006: 7). Much like language skills, computer skills should be developed early on with pupils to ensure that by the time they become job candidates, they are ready for the modern work environment.

Since one of the conclusions presented in this work is that the optimal use of computers is at pupils' fingertips, this work will not concern itself with the development of new material by teachers. Therefore, using the internet to download and prepare labels, flashcards, worksheets, workbooks, picture dictionaries, games and so on, already a practice common among teachers (Feierabend & Klingler 2003: 38), will not be discussed here.[4]

Additionally, preferring textbooks to web-based resources frees the teacher of the need to develop her own texts. Textbooks such as Playway provide stories, chants, poems, songs, and rhymes which satisfy children's interests and the curricular requirements.

> "When you look in the internet for stuff, you will find things that have been didacticized, but you will also find lots of things you will have to simplify. And this, the simplification, is of course something that requires a lot of work and almost near nativeness. And we do not really know what the level of competence of the teachers actually is" (Gerngross 2008: 2'20'').

The possibility of using computers either independently (e.g., as part of *Freiarbeit*, at the media corner or school's self-access center) or during afterschool hours (i.e., at home) is also not discussed here. Nevertheless, data on the way children use their home computers will serve to proffer the thesis that they can benefit from using an appropriate piece of software to express their interpretation of texts in the EFL classroom.

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[4] Cf. Michel, Lutz P. (2008): *Digitale Schule – wie Lehrer Angebote im Internet nutzen.* Essen: MMB-Institut für Medien- und Kompetenzforschung. [Online available at: www.dlr.de/pt/PortalData/45/Resources/dokumente/nmb/MMB_Veroeffentlichung_Lehrer_Online_20080505_final.pdf, 22.06.2008].

Many of the sources cited in this work were retrieved from the World Wide Web. This was a conscious decision which echoes the origins of the internet as an interuniversity network. In the process of writing this work, the internet has offered a threefold advantage over conventional literature: the possibility to sift through large volumes of information, retrieve up-to-date data, and most importantly, read about teaching practices in real-life situations. The latter point is where the internet truly distinguishes itself from traditional literature. After all, most teachers do not report their individual lesson practices and results in scientific papers or professional journals.

To easily access the web addresses cited in this thesis by clicking on them, the work could be also viewed in portable document format (PDF) on the enclosed Resource CD, which also includes samples, examples, and additional resources (Appendix 2).

1.1 Writing conventions

Throughout this work the personal pronoun “she” refers to a primary school teacher because of the overwhelming majority of female teachers in this profession. “In class” simply implies during the lesson, be it in the classroom, in the computer lab, or elsewhere. The current situation at schools in the Federal State of Hesse is referred to whenever pertinent information could be found. In many instances, though, only nationwide findings were available. The UK is often mentioned for benchmarking purposes. Research done in the UK is easily accessible, and the size and composition of the population help shed light on the topic through the occasional comparison. Nevertheless, one should be reminded that British schools are *Ganztagsschulen*, thus making work with computers more feasible with regard to time.

> “There’s always this time constraint, and you have got 27 kids (like today, this morning, when I taught 27) and you haven’t got 27 laptops, and you haven’t got sort of three hours where you can try things out” (Gerngross 2008: 27’44’’).

> “If we had time, if we had *Ganztagsschule* (and you had enough time for kids to also exercise, because it’s important, they shouldn’t sit all the time), but if you also had, let’s say, enough hardware and good software, they could do quite a lot. The kids would learn from one another” (Gerngross 2008: 26’53’’).

2. Background information

In German primary schools there is an average of one teacher for every 14 pupils (UNESCO Institute for Statistics 2006). Nine in ten teachers are female (Feierabend and Klingler 2003: 5; Feil 2007: 187 et seq., Gerngross 2008: 1'54''). In primary education, foreign languages are taught by generalists (non-specialists) who teach several of the subjects in the curriculum (Eurydice, 2005).

Primary schools in Hesse include grades 1 through 4 (age 6-10). In 2006 there were on average 21 pupils in every class and 200 in every school, 14% of whom were foreigners (Statistical Office of the State of Hesse 2008).

Similarly to 13 other federal states, a foreign language is a compulsory subject in Hesse and is taught in grades 3 and 4 (i.e., ages 8-10) twice a week (within an overall load of 25 lessons a week), each lesson lasts 45 minutes. These amount to 150 lessons in the course of those two years. English is by far the most popular foreign language, taught in more than 1,100 primary schools in Hesse. In about 45 schools French has been the preferred foreign language for many years; in 2 other schools Italian is taught (Gompf 2006: 4).

Listening comprehension and speaking are two skills with the highest priority; reading and writing are the other two skills which play a supporting, and therefore, a secondary, role. (Standing Conference of the Ministers of Education and Cultural Affairs of the Federal States 2005: 2). The little importance of orthography in the curriculum may allay fears expressed by many opponents to the use of computers in school that typing damages children's handwriting and spelling skills.[5]

[5] Cf. Stoll, Clifford (1999): High Tech Heretic: Why Computers Don't Belong in the Classroom and Other Reflections by a Computer Contrarian. Mechanicsburg: Doubleday.

3. Statistics related to the primary EFL classroom

Before making any recommendations as to how textbooks could be supplemented, it is important to consider how teachers utilize computers in their weekly language lessons, if at all. Before discussing the potential of using computers for language learning and the danger of wasting precious time by misusing it, it is important to examine the reality in the classroom.

Side by side with the advent of computers, a growing body of literature and case studies on the versatile use of computers has developed. Unfortunately, as statistics show, many of the more advanced applications of computers in the EFL classroom, such as e-mail exchange projects, are “flagship projects” – they are exceptions which prove the rule. As much as those projects might be supported by sound pedagogic practices, they demand resources, both human and computer, which are beyond reach for most primary schools in Germany. Such projects often take place for examining the viability of “best practices” (Herzig & Grafe 2007: 70).

To an observer with scant understanding of the actual attitude and approach toward using computers in primary schools, those few and far between “flagship projects” which integrate ICT into English lessons might leave the wrong impression. Those cases are not the tip of the iceberg – they represent the bulk of it. They serve to represent some schools – they are certainly not representative of all schools. The skills, resources, attitudes and time which are required for those ICT-based projects are typical of a limited circle of pilot, magnet, experimental, and other especially selected exemplar schools and do not reflect the everyday use of computers in the common classroom in Germany.

Before presenting the statistics, it is worth mentioning that none of them make any specific reference to Hesse. Since no contrary evidence has been found, it is assumed that the following Germany-wide statistics reflect the local situation.

Finally, the statistics presented here are not of uniform quality. Some involve thousands of respondents, some “only” hundreds. In some of the studies two sources, e.g., children and their parents, teachers and their principals, were surveyed, in some only one. It seems that those studies which involved face-to-

face interviews were the most qualitatively telling, even when such a method meant surveying fewer respondents.

3.1 Pupils' computer use at home

Investigating how many children have and use computers outside primary school can tell us what children feel about using computers in their free time. It can help answer questions such as is the inclusion of computer use in the curriculum learning-centered or learner-centered (Cameron 2001: 1-2)? Are computers all about dependency on others (e.g., plagiarism), or can they also support self-directed learning? Does work with computers come to children as naturally as it does to adults? Answering these questions might also hint at the extent to which computer-assisted language learning at school could be complemented, or even completely replaced, by homework done with the home computer.

Three large-scale, nationwide surveys conducted in recent years could answer those questions. The one done by *Egmont Ehapa Verlag* in 2006 surveyed 1,652 children (age 6-13) and their parents with questionnaires which had been enclosed in 36 children's magazines.

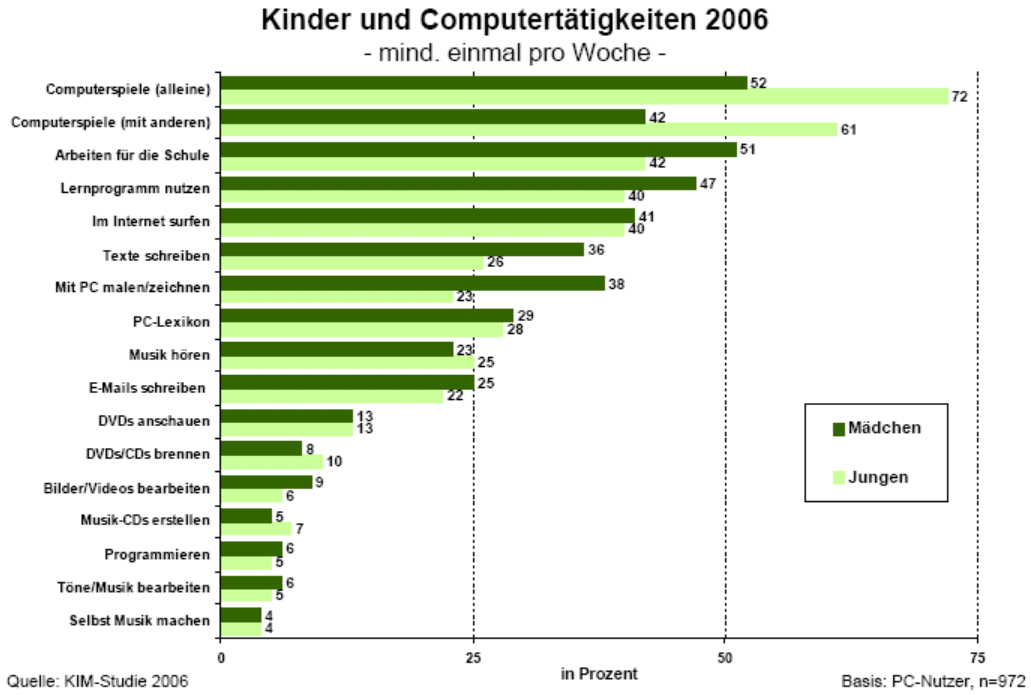
The second survey was carried out by Feierabend and Rathgeb who in 2007 conducted personal interviews with 1,203 kids (age 6-13) and in parallel gave the caretaker (often the mother) a complementary questionnaire.

In a more recent nationwide survey of 841 young people (age 10-19) conducted by IconKids & Youth, respondents were interviewed at home about their use of computers at home and at school.

All of the surveys stress the prevalence of using computers at home. According to the *Kids Verbraucher Analyse*, 60% of the surveyed children use a computer at home (Egmont Ehapa Verlag 2006: 27). According to CHIP, 81% of primary pupils use a computer at home (IconKids & Youth 2008: 5). Similar results emerged from the KIM Study: nine in ten families own a computer, with 81% of the children making actual use of them (Feierabend & Rathgeb 2007: 29).

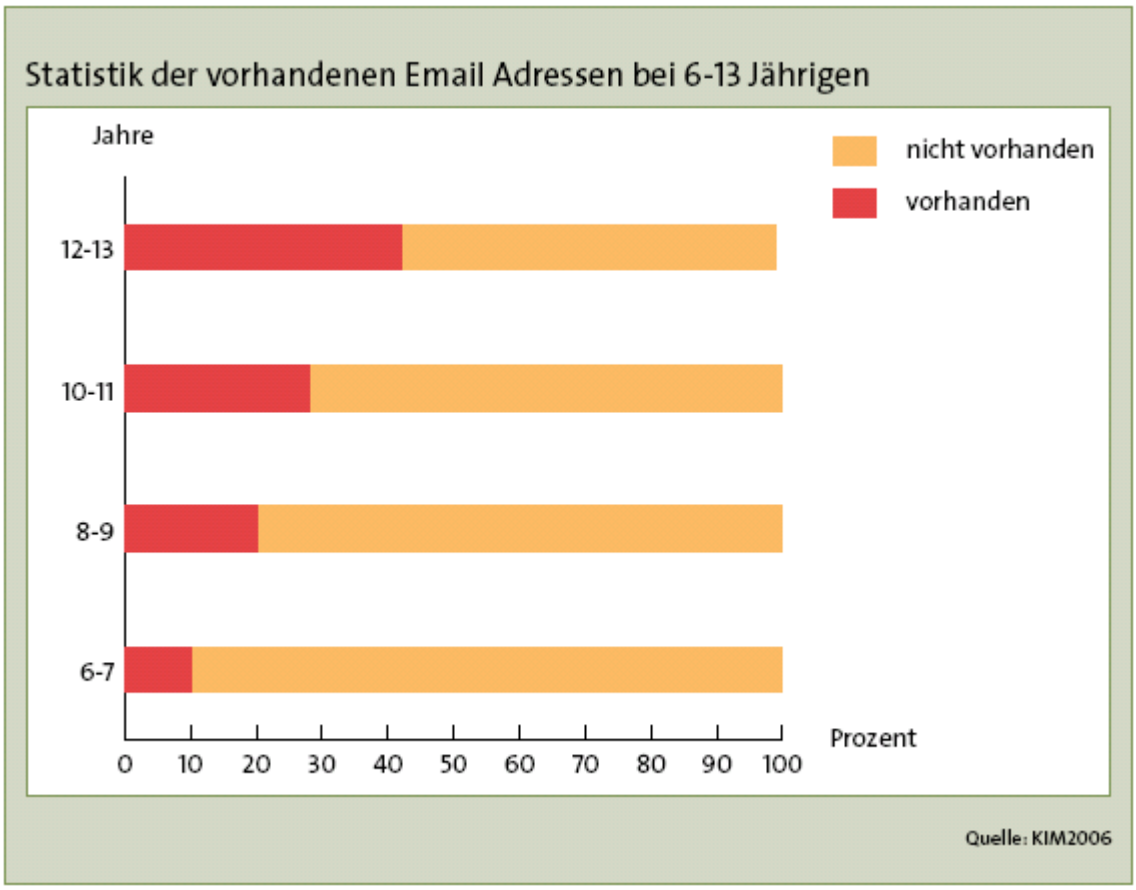
How children use computers is also revealing. As might be expected, the most popular activity is playing computer games, alone or with friends. Not much behind, 46% of the children use the computer regularly for doing their homework (Feierabend & Rathgeb 2007: 32). It is interesting to see that e-mailing is not a very popular activity among children – only one in every five children e-mails on a regular basis, a finding also corroborated by the *Kids Verbraucher Analyse* (Egmont Ehapa Verlag 2006: 31). Learning about children's preferences can help us design ICT-based activities which reflect their interest in computers rather than impose on them their teachers' preferences.

Both KIM and *KidsVA* studies indicate that with approx. half of the children, the popularity of using learning software (e-learning) closely follows behind playing computer games. The most popular learning programs are for mathematics and German, with foreign languages coming in third (49 %). In other words, one in five children who have access to a computer at home uses it with a dedicated piece of software for learning a foreign language at least once a week (Feierabend & Rathgeb 2007: 40). This might be due to the importance of foreign languages in primary school as reflected by the number of weekly hours and as perceived by the parents.



3.2 Pupils' internet use at home

Although 81% of German children have access to the internet at home (Feierabend & Rathgeb 2007: 41), only 58% actually belong to the circle of surfers, i.e., they are active online. According to *KidsVA* 2006, the figure for regular internet users among children aged 6-13 stands at 46% (Egmont Ehapa Verlag 2006: 31), whereas CHIP Study reports 65% for the same age group (IconKids & Youth 2008: 11).



How children use the internet is also eye-opening. Both KIM (p. 44) and *KidsVA* (p. 31) studies confirm that the most popular online activity is searching for information as part of doing homework. Unfortunately, the literature does not provide any information about what subjects are mostly researched online. Also here the limited use of the internet for e-mailing is evident: only one in five children is engaged in this activity either at home or at school (Feierabend & Rathgeb 2007: 44; Feierabend & Klingler 2003: 42). According to *KidsVA*, one in four children exchanges e-mails using the home computer (Egmont Ehapa Verlag

2006: 31). This stands in stark contrast to internet use of teachers, where e-mailing is the most popular online activity (Feierabend & Klingler 2003: 29, 38).

> „Was für Lehrpersonen ein sinnvolles Medium ist, kann für Lernende umständlicher «Schnee von gestern» sein. Was Lernende für sinnvoll halten, kann Lehrpersonen überfordern“ (educa.ch 2006: 9).

3.3 Teachers' computer use at school

Here too we find three primary studies which reveal the usage of computers in primary school.

In 2006 Korte and Hüsing from *empirica Gesellschaft für Kommunikations- und Technologieforschung* interviewed 450 head teachers and 901 classroom teachers in Germany. In their survey, the researchers did not make a distinction between the use of computers online and offline. In their research computers also stand for the internet, and vice versa.

In the same year, Krützer and Probst received filled out questionnaires from 13,814 primary schools in Germany. According to them, the ratio of pupils to computers in primary schools stands at 12:1, which means that there has been practically no change since 2003 (Feierabend & Klingler 2003: 47). According to the study done by *empirica*, there is one computer for every 10 children (Korte & Hüsing 2006: 2). This is almost double the ratio found in British primary schools, where the mean number of pupils per computer stands now at 6:1 (Kitchen et al. 2007: 36). Nevertheless, Germany is one of only three EU countries in which primary schools are better equipped than secondary schools in terms of number of computers per pupils (Feierabend and Klingler 2003: 46). Then again, this might be more to the disrepute of German secondary education than a badge of honor to primary education.

> “I haven't seen so many computers in the classroom actually, so that's why it is rare. It sort of hasn't been set up yet, it's not a normal thing yet to use the PC or laptop in the classroom” (Gerngross 2008: 4'36'').

Already in 2002-3, the *medienpädagogische Forschungsverbund Südwest* conducted telephone interviews with 700 primary school teachers. It found that primary teachers used their personal computer for an hour every workday, half of which was spent surfing the internet (Feierabend & Klingler 2003: 29, 37). These habits put teachers above the national average. Unlike computer competence, most of the primary teachers surveyed believed that internet competence should be imparted only in secondary education (ibid p. 20). Approximately two thirds of the teachers recognized the importance of computers and the internet for their pupils' professional life (ibid p. 34). The study also found that primary school teachers have a concrete and realistic picture when asked to describe the use of home computers and the internet by their pupils (e.g., with regard to learning software) (ibid p. 13).

Four years later, *empirica* Study reported that Germany was ranked 11 in Europe for using computers in primary school with 22% of the country's primary teachers not having used yet computers in class. Those figures were two to three times higher than the European average. Those teachers stated at least one of these reasons for their (non-)actions:

1. A lack of computers at their school;
2. Are not convinced of any benefits of using computers in class;
3. A lack of adequate skills to use computers for teaching.

> "It appears that action is urgently required in the area of motivation towards, and teacher training in, ICT use in German schools" (Korte & Hüsing 2006: 3).

Even though primary teachers are generalists who teach several subjects and are therefore expected to show little variation in computer use in their different teaching subjects, a clear hierarchy has developed over the years. It was found that in 58% of primary schools computers were used to teach a foreign language, compared with 50% in 2005 (47% according to Korte & Hüsing 2006: 3), far behind their use for teaching natural sciences (Sachunterricht), mathematics, and German (Krützer & Probst 2006: 24, 27). On the face of it, these findings might not be surprising given that "left-brained" teachers, who are familiar with exact sciences, tend to use computers more extensively than "right-brained" teachers with a background in the liberal arts and such.

3.4 Pupils' computer use at school

The picture gets murkier when we try to assess the number of pupils who actually get to use computers in primary school. Even though 99% of schools are equipped with some sort of computers, only 78% of primary schoolteachers use computers in class, mostly with pupils (compared with 97% in Britain) (Korte & Hüsing 2006: 1-4 in respective country briefs).

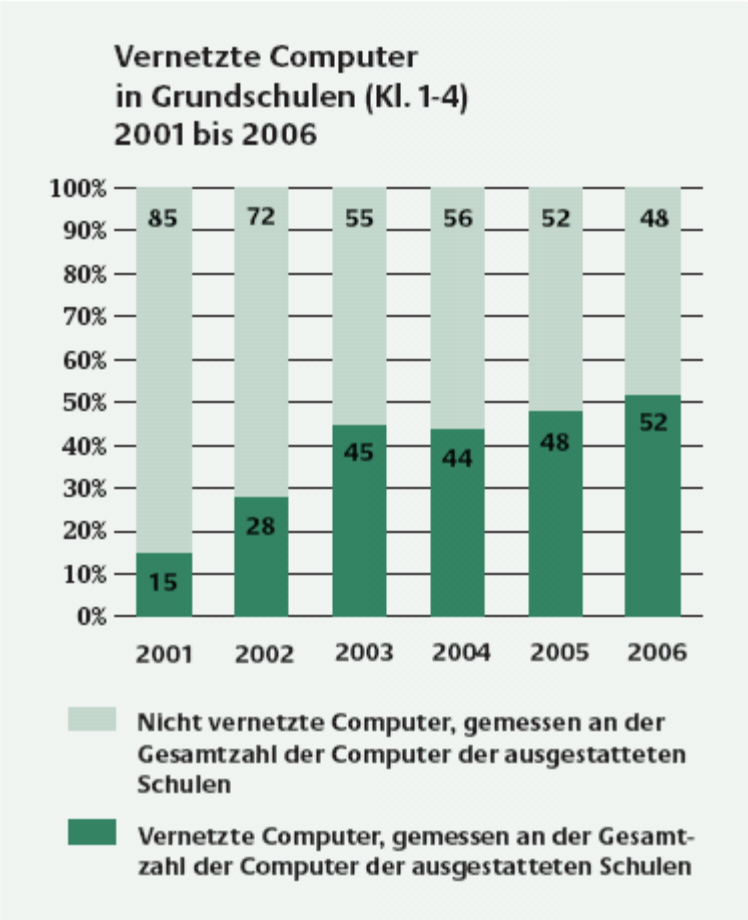
The latter figure is contested by two other studies. According to CHIP Study, only 30% of pupils use computers in class. This finding was reinforced by KIM Study, which found that only 33% of pupils use computers at school at least once a week (Feierabend & Klingler 2003: 30, 40; Feierabend & Rathgeb 2007: 30, 40). When they do use one, 89% (IconKids & Youth 2008: 18) have to share it with at least one more pupil (84% according to Feierabend and Klingler 2003: 42).

"I have seen, if I remember correctly, one PC standing somewhere, but I didn't have the feeling that this is regularly used" (Gerngross 2008: 19'48''). Slow internet connection also accounts for the large number of classroom workstations which are left untouched (Krützer & Probst 2006: 13; Korte & Hüsing 2006: 2).[6] Taking a look again across the Channel, 80% of all British primary schools use computers for teaching in classrooms. The United Kingdom takes the first position in Europe on this indicator (Korte & Hüsing 2006: 1-2 in UK country brief).

3.5 Teachers' internet use at school

Every second computer in primary schools (grades 1-4) is equipped with broadband internet connection (28% ISDN, 22% DSL, 2% WLAN) (Krützer & Probst 2006: 41; Korte & Hüsing 2006: 1-2 in respective country briefs). In the UK, this figure stands at 74%. The availability of fast internet connection is a cause for concern when we observe its growth over recent years. It seems that since 2003 the trend to connect more schools to the internet via broadband has largely come to a halt.

[6] Advice on how to deal with the One-Computer Classroom can be found at: www.techtrain.org/resource/1c_bmark.htm; www.tcet.unt.edu/weblibrary2/overview/?id=17; http://kathyschrock.net/1computer/1computer.htm, 21.06.2008.



Ill. 3 Source: Krützer & Probst 2006: 48

> "Zwischenzeitlich können Schulen kostenfrei einen 6 Megabit [pro Sekunde]-Anschluss erhalten. Dieser ist etwa 90-mal schneller als ein ISDN-Anschluss. Dass über 40% der Schulen trotzdem weiter die veraltete ISDN-Technologie nutzen, ist erstaunlich" (Karl 2007: 17).

In 2002, 2,394 primary school principals in Germany (grades 1-4) filled out a questionnaire for the project "School and Social Networks." The study showed that the internet was mostly used by school administration and teachers (59%) and that only one in five teachers frequently used the internet in class (Lipski & Kellermann, 2002: 6-7). Five years later, the study "Learning with the internet," which surveyed 881 teachers from 491 primary schools (grades 1-4), still found that only one fifth of the teachers used the internet in class on a weekly basis (Feil 2007: 187 et seq.). It is clear then that despite the existence of internet connection and computer equipment in primary schools, they are seldom put into use in class.

When asking teachers about the obstacles to using the internet in class, Feil encountered explanations similar to those mentioned in the *empirica* study for the disuse of computers:

1. Almost half of the teachers said that there were too few computers with internet connection, and a third said that computer equipment was outdated.

2. About half of the teachers felt they needed further IT training, and 80% felt their colleagues needed further training. This might partially explain why every second teacher experienced technical problems which obstructed the use of the internet in the lesson. The last finding is corroborated by CHIP study, which found that with 55% of the pupils computers at school often malfunction (IconKids & Youth 2008: 15).

3. One in three teachers claimed that planning and preparation were too demanding.

> "The still sub-optimal quality of the internet connection in many schools and very importantly the lack of motivation of teachers not using computers for using ICT are the most critical issues for a wider uptake of computers and the internet in schools in Germany" (Korte & Hüsing 2006: 1).

Even though primary teachers are generalists who teach several subjects and are therefore expected to show little variation in internet use in their different teaching subjects, a clear hierarchy which neatly correlates with the use of computers in class has developed over the years. In 2006, it was found that in 37% of primary schools the internet was used to teach a foreign language (46% in Korte & Hüsing 2006: 3), far behind its use for teaching natural sciences (*Sachunterricht*), German, and mathematics (Krützer & Probst 2006: p. 8, 35). Similar findings appeared in "Learning with the internet" (Feil 2007: 187 et seq.) and already five years earlier in the study "School and Social Networks": foreign languages came in only fourth (Lipski & Kellermann, 2002: 7). Here again we can see that the use of the internet has not changed over the past half a decade. With the number of schools with new DSL connection decreasing, the role the internet in the EFL classroom is not going to change unless drastic measures are taken.

> "Um den internationalen Anschluss nicht völlig zu verlieren und die Technik auf dem neuesten Stand zu halten, hätte Deutschland in den letzten Jahren erheblich in die Computerausstattung investieren müssen. Dies ist jedoch nicht geschehen, denn die Wachstumskurve der neu angeschafften Computer verläuft auf einem zu niedrigen Niveau. Es ergibt sich ein negatives Wachstum" (Karl 2007: 16).

3.6 Pupils' internet use at school

KIM Study found that only 13% of the children who use the internet on a regular basis do so at school. The vast majority of children who use the internet do so either at home (68%) and/or at friends' (29%) (Feierabend & Rathgeb 2007: 41-2).

3.7 Implications for supplementing textbooks

We can reach several striking conclusions by looking at the ways pupils and their teachers choose to use computers and the internet at home and at school.

One of these conclusions is that currently the internet and its derivative applications (e.g., e-mail) do not play a major role either in the children's room or in the EFL classroom. If to judge by its use at home, the internet does not seem to appeal much to children aged 8-10, and the number of primary schools being connected to broadband has been growing sluggishly over the past five years. Further to that, the number of teachers who are unsure how to use it in class is significantly higher than the number of those who are confounded when it comes to using computers (Korte & Hüsing 2006; Feil 2007: 187 et seq.).

Therefore, the benefit of using the internet in class, especially on the tight schedule of two lessons a week and with a slow connection to the internet, is doubtful. Add to it the confusion of teachers (and parents!) when it comes to safety online (e-safety)[7] and whose responsibility it is to protect children from those potential hazards, it is made clear that the days of the internet in the EFL classroom are yet to come (Feierabend & Rathgeb 2007: 43, 64; Feil 2007: 187 et seq.).

> "Zumindest bei uns in Deutschland ist es ein großes Problem, dass sich die wenigsten Eltern bewusst sind, was ihre achtjährigen Kinder am Computer tun: Die Buben ballern

[7] CD-ROM > E-Safety, and www.klicksafe.de, 14.06.08

> und laden sich vom Internet verbotene Sachen runter, die Mädchen chatten, wer weiß mit wem“ (Spitzer 2008).

3.7.1 Computer and internet infrastructure

“Das Bildungssystem hinkt der Realität in deutschen Kinderzimmern hinterher“ (IconKids & Youth 2008: 2).

This statement speaks volumes about the current situation of using computers and the internet in primary school. Computers play an ever-important role in the personal and professional life of pupils and their teachers. On the other hand, the use of computers in the primary EFL classroom is still in its bud, and that of the internet is almost an oddity. This is at a time when the need for closer links between formal and informal learning is increasingly recognized.

> “Eine neue Unterrichtskultur mit der Integration der digitalen Medien in den Unterricht ist unter diesen technischen Voraussetzungen nicht möglich” (Karl 2007: 15).

This situation is not new. Already in 2001 Germany had one of the most significant national gaps between the habitual use of computers at school (17% of the pupils) and at home (66% of the pupils) (Petko et al. 2007: 35). Six years later this gap remains open with 15 percentile points added to each figure, now at about 30% and 80%, respectively. A minority of children don’t have any opportunity to use computers.

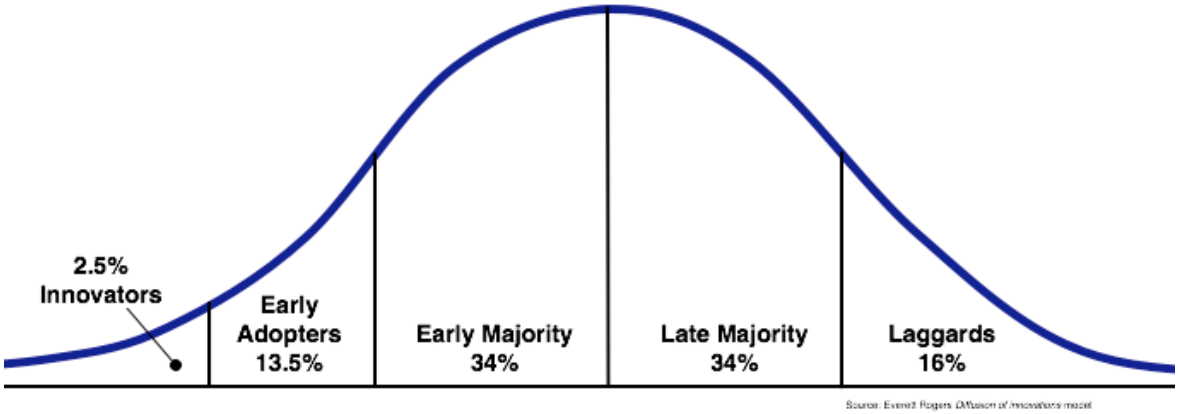
An e-mail received from the subject teacher whose classes I used to teach for my Classroom Action Research projects provides a glimpse of the situation in Hesse:

> “Ich habe noch nicht mit dem Computer im Englischunterricht gearbeitet – leider. Wir haben ja nur 8 Computerplätze in der Schule und es müssten immer zwei Personen für die Klasse da sein, um mit einem Teil der Kinder in den Computerraum zu gehen“ (Reisinger 2008).

Even when much of the feasibility of using computers depends on decisions made anywhere but in primary schools, the aim of this thesis is not to criticize the politicization of the education system in Germany and its effects on the rich-poor divide. Instead, the aim is to propose possible solutions to the current impasse in using computers in primary education.

3.7.2 Teachers' IT skills

Another obstacle to using computers in class is the level of teachers' preparedness to operate and maintain computer and internet infrastructure. The statistics presented earlier paint a picture of 20%-25% of teaching staff being computer adept (Feil 2007: 187 et seq.). Obviously, only a fraction of them would happen to teach a foreign language. Another 20%-25% still put up resistance to using computers in their lessons. The rest, about one in two teachers, rarely use computers, perhaps more as a "comic relief" or "time killer" than as a an integral part of their methodology. And as it is with any method which is used only occasionally, it is questionable whether the use of computers in class has any impact on pupils' achievements.

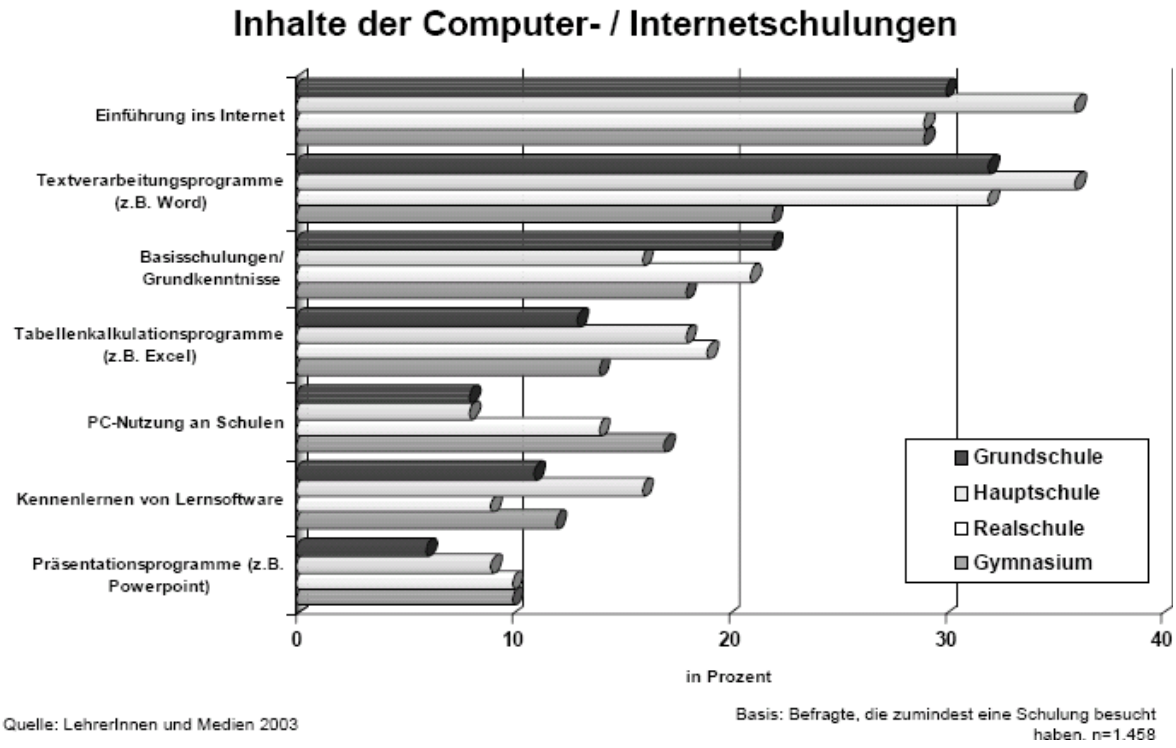


Ill. 4 Rogers' Technology Adoption Lifecycle Graph[8] Source: Wikipedia

Children's ability to imitate greatly depends on their teacher's ability to explain (Feil 2007: 187 et seq.). And if the teacher lacks the knowledge necessary to operate and maintain computer equipment, then she will show a lack of motivation to use it in class. The feeling of inadequateness which accompanies the apocryphal female, "right-brained" primary language teacher when it comes to using computers in class might be addressed by appropriate training.

On average, primary teachers complete three IT-training courses, mostly in introduction to the internet and word processing, competencies which are more relevant to teacher's work at home than to children's computer use in class.

[8] Cf. Rogers, Everett M. (2003): *Diffusion of Innovations (5th ed.)*. New York: Free Press.



The computer courses teachers take stand in complete contrast to the interest they have expressed in computer programs which target pupils as the end-users.[9] In other words, teachers would like to take part in ICT courses which are less informational and more practical (Feierabend & Klingler 2003: 43-45).[10]

3.7.3 Teachers' methodological skills

Teachers need not only to be computer literate, but they also need to develop skills in integrating computer use into their lessons. While these skills in integrating the computer into the curriculum may be helped by some in-service training, they primarily develop out of experience in using computers in the classroom. Currently most teachers have little such experience primarily due to a lack of resources (time and equipment).

The statistics have shown us that primary teachers use computers and the internet in class at least twice as much as their pupils get to use them, indicating a frontal teaching style. An artificial gap is opened here between the teacher, acting as a

[9] Some websites offer free instruction on how to operate such programs: http://its.leesummit.k12.mo.us, and www.learnquebec.ca/en/content/pedagogy/cil/teach/teachja.html, 21.06.2008.

[10] One example of such a course is offered by Blickwechsel e.V. at www.blickwechsel.org/hessen_grundschule.html, 02.06.2008.

qualified user, and the pupils, who are assumed to be uninitiated users. As we have seen, this is an artificial construct created by the education system – it does not reflect pupils' true computer competencies.

Although teachers do not seem to have reservations about using computers at home, they do seem to be prejudiced against using them in class. Some might feel that the potential of computer-based training (CBT) for reducing the teaching workload has never really materialized; some might see in computers a threat to their sovereignty in class. As much as this does not bode well for the future of using computers in primary education, the underlying positive attitude toward the use of computers in general gives a reason for hope.

3.7.4 Summary

As we have just seen, there are three main aspects to the use of computers by teachers in classroom situations. Aside from computer and internet infrastructure,

> "Es sind im Wesentlichen zwei große Bereiche, die zur Ablehnung von computergestütztem Unterricht führen. Es sind einerseits – durchaus begründete und keineswegs peinliche – Versagensängste, wenn z.B. die Technik mal wieder nicht mitspielt oder die SchülerInnen alles besser können. Zum anderen sind es didaktisch-methodische Defizite: ein Großteil aller Lehrpersonen hat keine Ahnung, wie und warum man EDV und Internet didaktisch sinnvoll einsetzen und wo man sich knapp und effektiv darüber informieren kann" (Metz 2003: p.44-45).

This rest of this work will deal with the last aspect in the context of using textbooks in the EFL classroom.

4. Choosing and using educational software

As we have seen in the previous chapter, teachers' reluctance to use computers in primary school originates either from lack of knowledge, lack of motivation, or confusion about what can and cannot be achieved with computers. Teachers could consult with the school IT-administrator or the regional helpdesk service, such as the *Serviceeinheit Mediendienste* in Hesse.[11] Once the teacher is comfortable with using computers, including some basic troubleshooting skills, she is more likely to use them in class.

As stated earlier, children's ability to learn greatly depends on teacher's ability to explain. Since motivation and knowledge often hinge on each other and on teacher's personality, it follows that the real question is *what are computers good for?* Can they meet existing needs in a way unparalleled by traditional teaching methods? Answering this single question will not only justify the use of ICT-based resources in the primary EFL classroom but will also instruct us how to use them to supplement textbooks.

Choosing new software for curricular activities can be time-consuming and costly, but looking for experiences of other teachers with a piece of software should indicate how effective and useful it is. Additionally, asking pupils to name their favorite computer programs and websites they frequently use will provide further information on what they can and like to do (Möllemann 2006: 21-22).

Teachers could also inform themselves about the applicability of some programs by browsing the following websites:

1. i-CD-ROM Datenbank für interaktive multimediale Bildungsprogramme und Lernsoftware;[12]
2. Internetportal für Lernhilfen- und Lernspielesempfehlungen im deutschsprachigen Raum.[13]

[11] http://medien.bildung.hessen.de/einrichtungen_medien/support/index.html, 16.06.2008

[12] www.i-cd-rom.de, 16.06.2008

[13] http://lernklick.de, 16.06.08

4.1 Why use computers in the EFL classroom?

Working with computers often requires pupils to operate non-verbally. This might sound as if the use of computers defeats the purpose of learning a foreign language. Nevertheless, since conceptual thinking is a higher, more abstract thinking skill it plays a critical role in supporting verbal thinking. Mind mapping, for one thing, often makes use of pictures to demonstrate relations between words, thus supporting verbal thinking. In a similar vein, non-verbal work with computers reinforces the retention of lexical fields. It ranges from dragging and dropping a textbox onto its corresponding picture to matching sound bites to images and then ordering them in the right sequence. As we will see later, multimedia authoring programs require pupils to import bits of information (e.g., sounds and images) and then order them in a form (a storyboard) which follows a certain function (creating a talking book).

> "The combination of text, pictures, sound, tables, graphs, simulations or models may help provide the link for students between that which is immediately linguistically accessible and that which is cognitively accessible" (Davies 2004: 14).

Computers provide pupils with the opportunity to work bilingually. This assertion seems counterproductive to the purpose of learning a foreign language, but with young learners, eliminating such function from a computer program would mean limiting its usability. Pupils should be encouraged to toggle between the German and English graphical user interface (GUI). This is also a very effective way to introduce functional words "through the backdoor" – words which are not part of the curriculum yet come in handy when operating the program. At any rate, the interface language is not an important factor when preferring one program to another – it is the context it is used in which matters.

Perhaps an overlooked aspect of computer use is its provision of multilingual support materials for monolingual teachers. This is especially true with non-native English speakers, who tend to mispronounce words whose phonology deviates from their orthography.

> "I mean, even two [children] are usually too many for one laptop. That's what teachers sometimes do – they've got two [children] for one laptop. But, actually, what happens is

> that one takes over and the other just watches, which is not ideal. Because it's a lonely thing, basically, isn't it?" (Gerngross 2008: 34'49'').

In fact, experiments have shown that collaborative work flourishes in computer-supported learning environments. A Thinking Together Educational Team research on promoting exploratory talk through the use of ICT in the primary classroom demonstrated how pupils who work together at a computer can be moved away from an IRF structure: Initiation (computer), Response (learner), Feedback (computer), toward an IDRF structure where D represents pupil discussion using exploratory talk. Instead of immediately reacting to computer prompt, learners discuss possible answers (Wegerif 2004: 8-9). This, in turn, increases children's exposure to the target language and their reflection on meaning and functionality.

> "Nur wenige Arbeiten am Computer müssen ausschließlich von einer Schülerin oder einem Schüler allein erledigt werden (etwa Übungssoftware benützen). Die meisten Arbeiten lassen sich zu zweit erledigen, und die Praxis zeigt, dass Schülerinnen und Schüler es auch vorziehen, zu zweit am Computer zu arbeiten. Wichtig ist dabei, dass Maus und Tastatur abwechslungsweise bedient werden, dass also niemand das Gerät «monopolisiert» (etwa indem Sie klare Regeln vorgeben und nach einer bestimmten Zeit wechseln lassen)" (educa.ch 2006: 22).

Children learn to negotiate with each other when planning the course and pace for the task. There is always the risk that one child will monopolize the process while the other takes the backseat, but even then the teacher must step back before stepping in – this is an opportunity for peer tutoring. Allowing children to form their own pairs can reduce such a lopsided work allocation.

The use of computers provides plenty of opportunities for learners to rehearse and practice new language items with automated evaluation and progress-tracking, better accommodation for the diverse starting points and paces, and rapid, consistent feedback. In English lessons, Teacher Talking Time (TTT) is too limited to give every child enough exposure to and practice of the language. Clicking repeatedly on a sound icon or doing the same exercise over and over again have yet to put the "patience" of computers to the test (Davies 2004: 16). Computers are nonjudgmental and tireless when repetitive tasks are called for.

> "At home, or when they use the CD-ROM, they do of course lots of exercises like drag and drop and this kind of things with the advantage being, of course, that when you make a mistake, or let's say you play bingo, you can do it a hundred times and there's nobody who breathes down your neck and says, 'now, why don't you finish?' You can do it again and again and again and again. So this is the advantage of the CD-ROM" (Gerngross 2008: 6'04'').

Albeit not an authentic practice of language, drill & practice software is especially suitable when language production is not required or possible. It can also support less secure language learners or very young learners who thrive on repetition. A recent research, part of a project at 1,600 primary schools in the UK, suggests that pupils learning a foreign language through lessons delivered via a CD-ROM progress at about twice the rate of children using traditional textbooks.[14]

The exposure to multi-sensory stimuli when working with computers gives pupils more physical pegs to associate information with. Evidence suggests that this leads to increased learning and more effective remembering of information (Becta 2006). Desktop publishing software allows EFL young learners to combine spoken, written, visual and graphic materials to create multimedia presentations, thus successfully expressing information and ideas which are just beyond their current level of English competence.

As the statistics have shown, by the time pupils experience their first encounter with the foreign language, many of them have already gained some experience with using computers. As much as mastery of languages is measureable (e.g., The Common European Framework of Reference for Languages), a comparison between two entirely different competencies might not be possible. Nevertheless, it could be reasonably argued that for most children, their ability to express themselves in the foreign language is considerably exceeded by their ability to operate a computer. Therefore, computers could serve as the fulcrum point to support new skills, such as using a foreign language.

[14] www.independent.co.uk/news/education/education-news/new-approach-in-language-lessons-helps-pupils-progress-more-quickly-822150.html, 02.06.2008.

The statistical evidence of the previous chapter indicates that as children grow up, they spend increasingly more time using computers in increasingly varied ways. Their exposure to English, however, might decrease dramatically once they graduate secondary education. For how long this interdisciplinary gap between pupils' language proficiency and computer competence stays open is a question which deserves further research. It is my contention, though, that this gap remains open throughout pupils' life, as we deal here with a developed, non-native English speaking country; more uses could be found here to computers than to English.

4.2 What computers are not

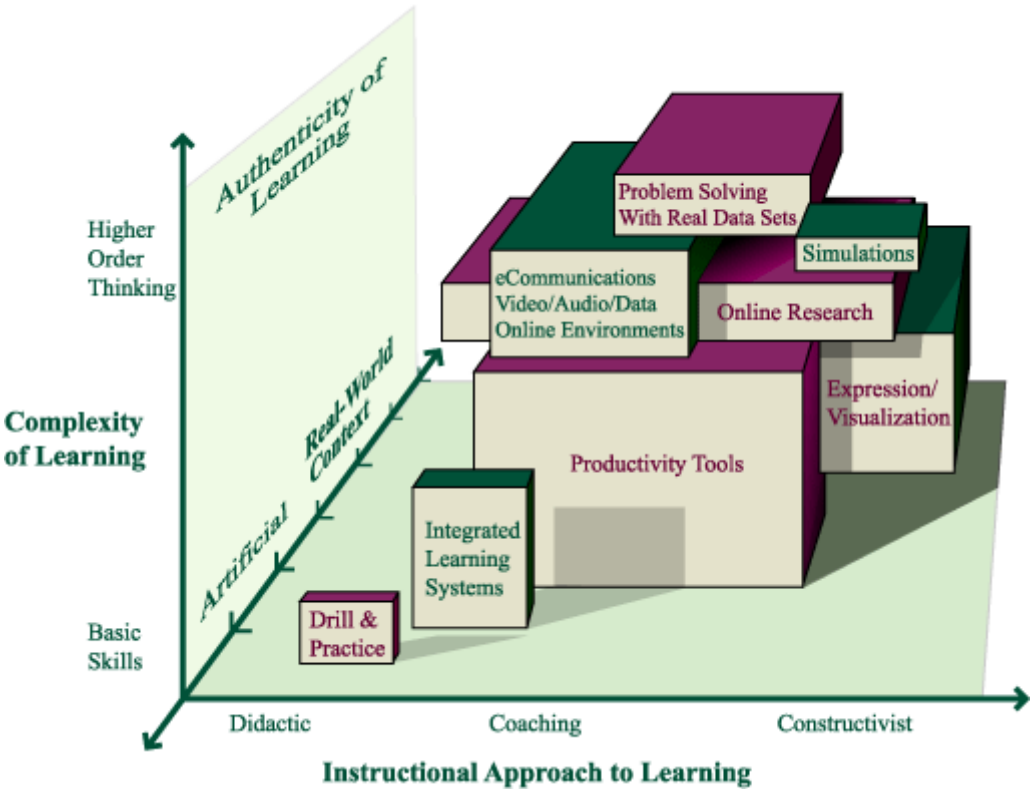
One objection to using computers in the foreign language classroom could be that they are worthless when it comes to communicating with the pupils. Computers cannot understand and react to spoken and written language the way humans do; they can only understand commands. The last thing a language teacher would wish is having to teach her pupils English *and* computer literacy skills! It might appear to her that the best practice would be using computers as the virtual mirror image of pencil cases, paper holders, pens, rulers, scissors, and glue sticks. This attitude could account for the scarce presence of computers in primary school lessons throughout Germany, as described in the previous chapter.

> "However, language work on a computer is not the same as authentic communication and so is limited in how far it can support learners to learn and process language. For example, programs do not provide formative feedback that can help learners identify how they could improve. Programs cannot discuss with the learners why they have said or written something in a certain way and how appropriate it is in the particular context. Programs cannot differentiate between the learner understanding of content and the means to express that content appropriately. The limit of artificial intelligence raises questions as to how 'interactive' programs can be – that is how closely they can recreate communication and the negotiation of meaning which is the essence of language use" (Davies 2004: 17).

The other strategy for dealing with the ineptitude of computers at authentic, multichannel communication is to limit their use to forms of asynchronous and synchronous communication, such as e-mail, web forums, instant messaging, audio and videoconferencing (the "flagship projects" of communicating with pupils in other countries mentioned in the introduction chapter). Alternatively, the pupil

might take on one of the roles in a play and the computer would take on the other(s) (“dialogue karaoke,” Gerngross 2008: 38’15’’).

In both cases the computer is put into use in a fashion which marginalizes its potential for the learning process in class. Both approaches could (and therefore should) be carried out using equivalent traditional practices. Using computers for a task which could be carried out just as well with traditional media is misuse of precious English time *and* computer uptime.



Ill. 6 Range of Use Chart Source: NCREL 2000

Teachers who still have reservations about using computers with the class might either misuse them, as described above, or give up on using them altogether. After all, carrying out an activity with pen and paper in the classroom saves the time it would take to escort the class to the computer lab and back to do there the same activity.

> “The computer would be a failure as a language teacher. So would a textbook. But both the textbook and the computer have valuable contributions to make to the language learning process. It’s hard to imagine teaching a language without the benefit of a

> textbook; for my part, I can't imagine teaching without the benefit of a computer" (Hoopingarner 2005: 3).

4.3 What computers are

As adults, we mostly use computers as purposeful tools to generate and modify material: office applications, graphics and presentation packages, word processors, and electronic spreadsheets. Similarly, using computers as tools in class takes advantage of their processing superiority to tap the intellectual capabilities of the learner in order to meet curricular demands.

We take our communication with computers seriously, not as a passive form of interaction as we would use DVD players to watch movies and portable media players to listen to music. We would normally not expect the computer to react to our utterances the way we would from another person – it is us who constantly need to lower our level of communication to that of the software we happen to use at that time.

In the primary EFL classroom, the native English speaker is the epitome of language use. Young learners are expected to pattern themselves on native or native-like utterances they are exposed to. In a similar vein, to promote the use of computers among "newbies," work should be done similarly to the way "old hands" at computers use them. The GUI itself may be simpler than that used in computer programs which target adult users, what matters is that work with the program simulates the way competent users work with their programs.

> "What does it mean to be digitally fluent? Consider the analogy with learning a foreign language. If someone learned a few phrases so that they could read menus in restaurants and ask for directions on the street, would you consider them fluent in the language? Certainly not. That type of phrase-book knowledge is equivalent to the way most people use computers today. Is such knowledge useful? Yes. But it is not fluency.
>
> "To be truly fluent in a foreign language, you must be able to articulate a complex idea or tell an engaging story; in other words, you must be able to "make things" with language. Analogously, being digitally fluent involves not only knowing how to use technological tools, but also knowing how to construct things of significance with those tools (Papert and Resnick 1995).

> "Fluency with language not only has great utilitarian value in everyday life but also has a catalytic effect on learning. When you learn to read and write, you are in a better position to learn many other things. So, too, with digital fluency. In the years ahead, digital fluency will become a prerequisite for obtaining jobs, participating meaningfully in society, and learning throughout a lifetime" (Resnick 2002: 33).

In such a case the young learner gets to practice the foreign language and gains *transferrable computer skills* which s/he can then use later in life.

> "The teacher has to do what the child may not be able to do: to keep in sight the longer view, and move the child towards increasingly demanding challenges, so that no learning potential is wasted" (Cameron 2001: 2).

The work process (project or task) should be broken down into distinct steps (activities), such as planning, designing, experimenting, implementing, revising, presenting, and evaluating.

> "Hierzu wurden jedoch im Rahmen des Instruktionsdesigns auch verfeinerte idealtypische Ablaufmodelle konstruiert, die dem menschlichen Lernen noch besser entsprechen sollten, z.B. die idealtypische Abfolge von Lernaktivitäten nach Gagné: 1) Aufmerksamkeit generieren, 2) Über Lernziele informieren, 3) Vorwissen aktivieren, 4) Material präsentieren, 5) Unterstützung bieten, 6) Leistung fordern, 7) Feedback geben, 8) Leistung beurteilen, 9) Erinnerung und Transfer fördern. Darstellende Medien besitzen insbesondere in den Schritten 1-4 ihre Stärken, interaktive Medien unterstützen auch die übrigen Schritte" (educa.ch 2006: 6).

Another possibility would be to follow the process of Creative Copying for retelling a story:[15]

1. Presentation of model text
2. Reconstruction of model text
3. Text production
4. Editing
5. Rewriting
6. Publication

[15] As presented by Günter Gerngross at Titus-Forum in Frankfurt on 11.04.2008

Media competence is the ability to use the computer as a multifunctional tool, a sort of Swiss army knife. “Das Herstellen und Gestalten von Medieninhalten in medienpraktischen Projekten ist ein Weg zur Vermittlung von Medienkompetenz“ (Feierabend & Rathgeb 2007: 54).

Using computers does not come naturally to children, but learning does. To unlock the potential of the computer, it is the child who has to learn how to operate it; the computer cannot operate at the same level the child does. Using a keyboard, for example, requires learning and practice just as putting pen to paper is an acquired skill. Pupils’ work at their home computer seems to correspond well with this idea. “Und wenn Sie den Computer als Werkzeug benutzen, ist das überhaupt nicht schlecht“ (Spitzer 2008). It is only at school where teachers try to sweeten the pill of working with traditional media by having pupils work with computers instead.

Curriculum integration is about exploiting the ability of computers to add value to teaching and learning processes by integrating computer-enabled activities into the curriculum. Computer-enabled activities can include a wide range of uses, such as generic software packages and educational software for interactive learning, simulations and content mastery. Similarly to the way children learn languages by using them, the most appropriate software would be one that children do not need to learn to use, but can use to learn. It is true for both languages and computers that the intention to understand and be understood is the best motivation for becoming a competent user. On the other hand, when subjects such as English, computers, and mathematics are taught without being put into practice, i.e., only to fulfill curricular requirements, then they merely serve as a dead weight on the young minds.

To sum up, the rule of thumb which applies to choosing computer programs for use in class is the one which applies to choosing textbooks – work with them must be engaging. As we will see in the next section, in the context of supplementing textbooks this translates into having children use open-ended software. Chapter 8 will discuss how different open-ended multimedia programs can support the task of creating a talking book.

4.4 Types of software: correct vs. create

Computers are useless without running some kind of software. Nevertheless, if the software requires more computer resources than available, it will be most probably of very little use. However, when minimal hardware requirements are met, a computer is as good as the software it comes with. For that reason, we can equate the potential of using computers in the primary EFL classroom with the possible benefits of using particular software in that context. For the rest of this section, therefore, the terms 'computer' and 'software' are interchangeable.

At this stage, becoming familiar with two key terms will make it easier for us to distinguish between two different types of software.

Close-ended (or: content-rich) ***software***

This learning software, often accessible on a CD-ROM, is programmed to detect right or wrong answers to a question. Pupils' input is restricted because unpredictability won't allow the program to check the exercises for mistakes. These programs are very popular among parents and teachers alike because they deliver content in accessible and engaging ways and save teachers time creating and correcting such exercises themselves (Feierabend & Klingler 2003: 42; Korte & Hüsing 2006: 4; Krützer & Probst 2006: 24).

The content can be loosely structured or searchable, such as in multimedia encyclopedias, or presented in a sequence based on skill level, learning outcomes or curriculum areas. Nevertheless, the use of software for learning a foreign language at home comes in only third and is even a less popular activity at school (Feierabend & Rathgeb 2007: 40). Examples include Budenberg[16] and Lernwerkstatt.[17]

The CD-ROM enclosed with Playway Activity Book is close-ended software designed to check understanding in a playful way and revise the material covered in class. It offers different modules which pupils can choose from at home, where other opportunities to practice and get feedback might not be available. "The CD-

[16] www.budenberg.de, 22.06.2008

[17] www.medienwerkstatt-online.de, 22.06.2008

ROM is mainly used for home use" (Gerngross 2008: 17'22''). It does not aim to provide the child with tools to express himself/herself within the context of the textbook. As mentioned in previous sections, it is questionable whether this is a good use of the limited user and computer time during the weekly English lessons.

Open-ended (or: content-free) ***software***

At the most generic level, a spreadsheet is a content-free software tool which can be used for creating graphs and exploring how equations can be represented graphically. Such type of software also includes word processors, multimedia content editors, programming software, web authoring and concept mapping programs. Similar to a sandbox, the pupil is free to create whatever s/he wishes to within an environment that can be used for exploration, simulation or creative tasks.

> "Can the child make any number of choices, can she click anywhere, or is the exploration limited? To avoid frustration children need to know what these limits are. When all this is known they will explore a section of the program on their own, often coming back and back until the supporting skills, like the different uses of the mouse for a particular operation, are established" (Mary Lou Thornbury).

Well-known educational packages of this type include Clicker[18] and My World 3 for Windows.[19]

[18] www.cricksoft.com, 22.06.2008

[19] www.dialsolutions.com, 16.06.2008

5. Choosing a computer-based task

The previous chapter has dealt with the fascination some teachers have with computers, even when it means completing tasks which could have been carried out just as well with traditional resources. The computer-aided process stands then in the fore without giving enough consideration to the task support it offers.

Before any piece of software is purchased and installed, it is necessary that teachers start by deciding what they want to achieve, understand what that software offers and explore the ways in which implementing work with that software can support teaching and learning. After all, it is the task at hand and the textbook in the hand which should define what software is to be used and how.

Teachers need to develop experience in choosing when to use computers and when not to by being aware of the types of tasks which computers do well. Moreover, the software has to provide a notable departure from the mainstay of learning materials and methods the class has access to. If the children are used to matching words to pictures in their workbooks, performing such exercises with computers will not have any intrinsic value to their language development as such. *The computer should only be used when it can support a task which otherwise could have not been carried out as effectively.* This statement carries with it three implications:

1. Only a few tasks need to be strictly computer-based, i.e., learning also takes place with pencil and paper, chalk and talk. This seemingly banal remark is sometimes ignored by “technomaniacs” who focus on the computer rather than the learning.
2. Computer-based tasks are specifically planned to make optimal use of computer resources. Those tasks can be fully carried out *only* with computers.

The two statements above could also be summarized this way: it is ultimately the task itself (e.g., its respective place within a lesson or unit) which justifies the use of computers; the use of computers per se is not enough to justify any task.

3. Some tasks which require the use of computers may fail due to a mismatch between task demand and task support offered by the program (e,g., the program is too buggy or complicated).

Of course, these implications still leave much to be desired in the way of task selection criteria – they don't tell us much about what could be best achieved with computers in order to, for example, supplement textbooks. They do make it clear, though, that even when a piece of software can perfectly serve, or at least not hamper, the completion of a computer-based task, the use of such software might lack any didactic value for all intents and purposes.

5.1 Task support offered by open-ended software

The next three subsections will discuss the properties a piece of software should have to make working with it a unique learning experience. These properties should manifest themselves in every computer-based task in class.

5.1.1 Self-directed learning and differentiation

The software should address a range of aptitudes and abilities. Pupils should be able to progress at an individual pace and should be allowed to use modules and functions of the software in a way and extent which fits with their personal preferences (Gerngross 2008: 7'18''). When asked to write, pupils may choose to write full sentences or only some words, design graphics or experiment with text size, color, placement, etc.

> "Der Einsatz von Multimedia in der Schule und besonders im Fremdsprachenunterricht erscheint mir deswegen besonders wichtig, weil es zwei Fähigkeiten zu schulen gilt, die man auch als die Schlüsselqualifikationen dieses Jahrhunderts bezeichnen könnte: Die vielberufene Medienkompetenz und die Fähigkeit zum selbstständigen, lebenslangen Lernen" (Mause 2001: 5).

With the limited time for English lessons, sticking to deadlines ("today is your day so use it or lose it") should be of paramount importance and also serve as an impetus to propel learners towards making progress. When learners think it is necessary, they should be allowed to continue through their breaks (e.g., at the media corner or the self-access center) in order to achieve what they have planned. Nevertheless, pupils should be reminded not to "overdo it" – working for one with a multimedia authoring program can be motivating, fun, and… addicting!

5.1.2 User-friendliness

The software should offer the user a clear indication of what it can do and how to do it. A drawing program, for example, should offer young learners various tools (pen, brush, stencil), with each of these tools being easily modifiable (color, thickness, pattern) but without using small icons to cram all of this functionality into a single workspace. Program features have to be clearly marked in the graphical user interface (GUI) by having, for example, an icon of scissors denote a cutting function.[20]

User-friendly design by necessity involves more than just following a set of rules governing button and menu placement on a monitor screen; the number of keystrokes and mouse clicks necessary to get the software to work also affects the way a pupil would feel about rushing headlong and experimenting with it until it is mastered.

As well as it may serve the teacher, step-by-step tutorials are not ideal for children to find their way in a piece of software. Children are more comfortable with figuring out by themselves the way a program works. This experiential approach of exploring a piece of software stands in contrast to the more textual approach found in adults, who often make use of speech bubbles, virtual assistants, and walkthrough tutorials.

> "They watch other children, elder brothers or sisters, and they pick this up pretty fast. We know that kids are quite good at that" (Gerngross 2008: 23'55'').

> "They try it out, they don't read manuals, they just try things out and find out. And his brother, the younger one, the middle one, who's two years younger, he just watches. And now he can do everything – he learns by watching" (Gerngross 2008: 26'35'').

On the teacher's part, a user-friendly program can test the language skills of her pupils without putting her or their computer skills to the test. Additionally, such a program provides the user a safety net, for example, when it recovers data from a

[20] More on the subject of interface design and human-computer interaction (HCI) could be found at http://industry.becta.org.uk/content_files/industry/resources/Key%20docs/Content_developers/interface_hci.doc, 22.06.2008

sudden computer crash or an unexpected shutdown, or when it is ended without saving the project. The measures offered by a user-friendly program could in this case be continuously making backup copies in the background and flashing a warning message at the user that the project hasn't been saved yet.

5.1.3 Cooperation and job allocation

The software should encourage learners to discuss problems, share their thoughts, and reach an executable agreement. Nevertheless, it is vital to determine in advance what mode of interaction the program supports (individual, pair, or group work) and whether this mode could be carried out under the present physical conditions (e.g., computer-to-child ratio) and task demands.

> "Kommunikations- und Kooperationsanlässe werden durch den Einsatz von ICT begünstigt. Durch den Computer als Kommunikationswerkzeug werden die Lernenden unterstützt, Lösungswege in kooperativer Auseinandersetzung zu entwickeln, unterschiedliche Problemlösungen zu vergleichen und gemeinsame Lösungen auszuhandeln" (educa.ch 2006: 16).

Going through the work process in pairs will give weaker students more opportunities to improve their computer and language skills (peer tutoring, Gerngross 2008: 28'47''). At the same time, it will also produce a true synergic effect if children divide the work between themselves in a way which makes the best use of their skills and personal inclinations to write, draw, operate the equipment, and so on. This could serve as an optimal solution for a mixed ability class. If the piece of software is not to be used for collaborative work, it is important that learners stay focused on finishing the task on time and do not get sidetracked by personal rivalries.

5.2 Task constraints imposed by computer hardware

This section will deal with the possible complications which can arise from using software to support computer-based tasks. Unless addressed head-on, those complications can mean the premature discontinuation of working with computers in class.

5.2.1 Computer equipment

Neither the teacher nor the pupils have the time or patience to wait for a computer to boot up and for a program to upload to its memory. To prevent the work with computers from grinding to a halt it is therefore recommendable that the equipment meets the minimum system requirements as indicated by the software manufacturer. This is of special concern for work with multimedia applications, in which case the available and desirable equipment should be compared for these specifications:

1. Processor speed or architecture – measured in hertz or number of cores;
2. Operating system – Linux, Windows, etc.;
3. Memory – type and size in megabytes of DRAM;
4. Hard disk space – the standard today is a minimum of 160 MB;
5. Drive – most drives today can read from and write onto (burn) a CD and/or DVD;
6. Display – size and resolution in number of pixels;
7. Speakers and/or headphones;
8. Internet connection – DSL speed is measured in megabits per second;
9. Peripherals – e.g., router, printer, scanner, microphone, webcam.

The condition of computer equipment directly affects the performance of a computer program and can be improved by upgrading old hardware and keeping new one up-to-date. Nevertheless, it is important to note that the potential of computers in the primary EFL classroom does not lie in the superiority of their performance, though state-of-the-art computers make work with them noticeably more pleasant. Newer, more advanced, and faster computers do not guarantee better learning outcomes; the possible benefits of computers lie entirely with their users, and more specifically, in their attitudes, skills and imagination.

5.2.2 Location and time

It is common nowadays to see one or more computers in the classroom, but most of them are kept outside the classroom in a special room, the computer lab (Feierabend & Klingler 2003: 48; Gerngross 2008: 19’48’’; Korte & Hüsing 2006: 2;

Krützer & Probst 2006: 13).[21] Since all pupils at school have to use the same lab, teachers cannot use it on demand but have to book it in advance. To make the most of the allocated time at the computer lab (not to mention the time of just getting there and back), it would be advisable to spend the entire lesson there.

As with any learning method, the use of computes in the primary EFL classroom has to be practiced systematically. Until this use is anchored in the curriculum,[22] it is crucial that the teacher makes it a habit for the class to frequent the computer lab at regular intervals. When we get to discuss the concept of usability in the next chapter, we will see that even an easy-to-use piece of software requires frequent use. Without frequent use, the user essentially relearns the software every time s/he uses it.

After discussing the unique task support offered by computers, it is time to look at the context which calls for using computers in the first place. But before that, we will see how working with multimedia applications promotes better learning outcomes than using learning software.

[21] There doesn't seem to be any record of the quality of the equipment itself, but it would be reasonable to assume that the well-equipped and well-maintained computers are those found in the computer lab.

[22] More about this in chapter 10 of this thesis, and CD-ROM > Curriculum

6. The case for using multimedia applications

6.1 What is multimedia?

Multimedia, a modern-day indoor version of son et lumière, is the representation of at least two of the following content elements combined:

1. Text;
2. Still images – drawings, diagrams, graphics;
3. Sound – audio, effects;
4. Moving pictures – video, animation;
5. Interface – interactive elements.

Ill. 7 Source: Wikipedia

Multimedia programs – having text, sound effects, still and moving pictures, and especially interactivity – enable a multimodal learning environment which caters to a range of learning styles by integrating numerous cognitive channels. Interactivity gives pupils plenty of opportunities to practice the four language skills – listening, speaking, reading, and writing – separately or in combination.

By integrating symbols, pictures, sound, text and animation into a single communicative experience, it is possible to create learning resources that engage visual and aural learners. By adding tactile instruments, such as keyboard and mouse, scissors and glue, writing implements, etc., it is possible to facilitate interactive, multisensory discovery learning that engages kinesthetic learners. Simply put, multimedia is more engaging and representative of life in general because it interfaces with more of the senses.

EFL learners can control the pace, and replay as often as they like, streamed multimedia output. It is easy to go back and forth and flick through screens to

recheck meaning and understanding. Hyperlinks to other screens, further information and word glossaries are easily incorporated, and text and audio can be differentiated for different levels.

6.2 Learning software vs. multimedia authoring programs (MAPs): consumption vs. production

The presence of multimedia in learning software (close-ended) and authoring software (open-ended) is not what sets them apart – it is the role multimedia plays in each one of them. With learning software, which is able to correct learner's input by limiting it in the first place (e.g., pointing and clicking with the mouse on the right word), multimedia is *the means* of creating multisensory stimuli at the user's end. Good learning software can give immediate and accurate feedback without being perceived as overly stringent.

> "The advantage of the CD-ROM is that you can do it in your own pace, you can do it as often as you want, there is nobody to rush you, and the correction is being done by the computer. When you think of, let's say, they hear a word and they have to click on the picture, then of course if they make a mistake, they can do it again and again, and sometimes Max says 'Ooh, you were not successful!' The kids laugh but they can do it again. There's never any kind of feeling of being patronized, of being looked down upon. You just do it again like in a game. When you do not reach a certain number in Nintendo, you don't give up but you try again and go again. This is the advantage of the computer" (Gerngross 2008: 10'46'').

With MAPs (sometimes called multimedia content editors or desktop publishing software), which allow learners to display their own creations to the class, the teacher and the parents, multimedia is *the end* which requires the combination of different media and language elements during the production process. Children are eager to express themselves in the foreign language once they are given the permission to do so (e.g., the "speakers' corner" in Gerngross's English lessons in which children are encouraged to say whatever they want and the teacher then recasts in English). A good MAP should therefore be as non-restrictive as possible when it comes to reproducing media without confusing the children.

> "Mediendidaktisch optimiert werden solche Möglichkeiten, wenn die Schüler nicht nur das Papierformular ausfüllen, sondern am selbst PC „interaktiv" Aufgaben bearbeiten und die

> Vorlagen umgestalten und weiterentwickeln dürfen. Mit leicht handhabbaren Autorenprogrammen können darüber hinaus selbst einfache Lernprogramme erstellt werden, wobei Lehrer und Schüler die Konstruktionsprinzipien von Multimedia durchschauen lernen“ (Schorch 2007).

6.2.1 Presentation of content

Learning software comes with an exhaustible amount of multimedia resources – only that much video clips, audio recordings, images, etc. can be stored on a single CD-ROM. Even when learning software can better echo the contents of a textbook it supplements, it also means that once these contents have been covered and a new textbook has to be bought, the old software is of little subsequent use and a new one has to be purchased. For programmers this would mean paying careful attention to the *content* design of learning software (since there is only so much that could be fit into a CD-ROM) and the *interface* design of a MAP (i.e., its usability, or the handle of the hammer, which puts its utility, the head of the hammer, in the user’s hand).

A significant advantage of an open-ended piece of software, being a generic tool to manipulate content, is that it can be invariably used with different textbooks. Although the production process with a MAP is fixed, it encapsulates endless possibilities since the contents (e.g., as represented in a storyboard) lend themselves to be easily modified. Learners can grow up using the same MAP for different subject matters whereas they can only grow tired of using the same learning software over and over again. Using a MAP would also mean making smaller long-term investments in new software.

> “Durch die damit einher gehende intensive Auseinandersetzung mit dem Sprachmaterial (und die Freude am kreativ-gestalterischen, produktorientierten Tun) ist der Lerneffekt möglicherweise höher als bei herkömmlichen Üben/Pauken, da das Aufbereiten für andere die inhaltliche Reflexion voraussetzt.“ (Lechner & Ziyal 2003: 214).

As enriching as working with learning software may be at any given moment, very little of the learner’s own work done with the program can be stored for later use, leaving a lot to be desired for the young learner’s long-term motivation. With MAP, results can be easily documented (saved) and exported (copied) for later use, for instance for compiling a computer-based portfolio (e-portfolio).

6.2.2 Access to content

To keep young users engaged while performing a computer-based task, they should feel neither bored nor frustrated with the piece of software they happen to use. Boredom sinks in when the child's curiosity is prematurely satisfied or when his/her competence remains unchallenged. Frustration takes over when the child's sense of discovery is overwhelmed or when s/he fails to perform the task using the program, often due to poor usability.

Boredom is a greater threat to users of learning software because its contents and their presentation are non-extendable. The degree of hypermedia connectivity, i.e., the ability to navigate between different multimedia elements, is finite. To prevent users from getting bored easily with the learning software, its contents should be at the right level and they should be gradually exposed to them (for example, in the form of a quiz in which certain requirements have to be met before advancing to the next lexical field).

The other end of the discovery spectrum, frustration, is of special concern to users of MAP and could be avoided by creating as simple as possible graphical user interface. Even if there isn't enough room for displaying all the features of the program on one screen, both visible and hidden features should be easily accessible (perhaps by dividing the screen into well defined "workspaces").

This section has compared two types of applications which make use of multimedia – learning and authoring software. Since this thesis proposes MAP as the better choice between the two to support computer-aided tasks in class, we will now turn to discuss the biggest obstacle to using such software.

6.3 Usability

6.3.1 Usability vs. utility

When inquiring about the *usability* of a computer program we are actually asking *what the learner can do with the program* and not *what the program can do*, the latter being the definition of the *utility* of a program. In the context of the primary EFL classroom usability would mean *what the learner can do with the program to achieve the task*. A highly useable program does not necessarily imply that pupils

can sit back and relax while it does all the work for them. Similarly, a highly utilizable program does not imply that pupils can click the time away while using the program. Those cases would actually mean an ill chosen program or a poorly designed task.

For a program to be highly utilizable it must be able to "converse" with other programs (e.g., for the sake of sharing files) and devices (e.g., printers) without creating any software conflicts (e.g., with other drivers).

> "Consider typical Microsoft® MS-DOS® word processors from the late 1980s. Such programs provided a wide variety of powerful text editing and manipulation features, but required users to learn and remember dozens of arcane keystrokes to perform them. Applications like these can be said to have high utility (they provide users with the necessary functionality) but low usability (the users must expend a great deal of time and effort to learn and use them). By contrast, a well-designed, simple application like a calculator may be very easy to use but not offer much utility.
>
> Both qualities are necessary for market acceptance, and both are part of the overall concept of usefulness. Obviously, if a program is highly usable but doesn't do anything of value, nobody will have much reason to use it. And users who are presented with a powerful program that is difficult to use will likely resist it or seek out alternatives" (Microsoft 2000).

Since usability puts the user at center stage, it is strongly affected by the user's age, experience with computers, preferred type and mode of work (e.g., in pairs), and gender.

> "The boys usually go more for computers; it's the same with adults… I think one key element is actually that, of course, we mustn't over-generalize here, but boys are more adventurous. I don't mean this in any positive or negative way, it's just that I've got the feeling that girls are more cautious, I think. But this might simply reflect the way they are educated" (Gerngross 2008: 29'54"').

Therefore, some pupils in the class might find a particular program more difficult to work with than others would.

As difficult as it might be to determine the usability of a program, it has direct consequences for the limited time allotted for EFL lessons at the school lab. Pupils

learn features of a highly usable program more quickly and retain their knowledge longer, which directly correlates to a decreased amount of time spent (re-)learning the program.

Once the children have been acquainted with two or more computer programs, it is possible to compare their relative usability. The teacher needs to observe the children as they work their way through the task and examine their final products to see how many of the features offered by the programs have been actually put to use. It would be tempting to determine the usability of the programs solely by comparing the *quality* of the final products. However, when assessing language performance learners should not be compared to each other but measured against a set of criteria (often in the form of a scoring rubric[23]). Similarly, the teacher has to bear in mind that girls, for example, might produce more aesthetically pleasing drawings no matter what computer program they happen to use. In our discussion about software usability we therefore should never take the users out of consideration.

With all this in mind, the teacher should not be preoccupied with measuring the usability of a program. As much as adults may be intimidated by technology, children are preconditioned to trying out new things: “When Danny, my oldest grandson, got this Nintendo, I tended to look at the manual first, but he immediately started playing, and he immediately threw himself into it” (Gerngross 2008: 31’25’’).

6.3.2 Finding a high-usability program

Before putting a program to the test, it is possible to get an impression of its usability by looking at how it makes use of input (mostly a keyboard and a mouse) and output (mostly a screen and a printer) interface devices.[24]

The inverse relation of utility to usability is imposed by the physical constraints of the interface devices. With high-utility software there is limited surface area to display all of its functions on a single screen. To avoid dumping all the features on

[23] CD-ROM > Photo Story > How to, and www.mediafestival.org/docs/CSMFRubricRev.pdf, 21.06.2008

[24] In some computers the screen can also serve as an input device (touch-screen).

the user right after the welcome screen, it might take more than a dozen keystrokes or mouse clicks to get the user where s/he wants to be.

For a program to be highly useable, its functions must be clearly displayed and easily accessible with a keystroke or a mouse click. This, in turn, means that not many functions could be packed into a high-usability piece of software.

Software engineers have been able to tackle the usability problem using two methods. One, which has already been mentioned in the previous section, is to allocate different screen areas for different uses (“workspaces”). Microsoft PowerPoint, which makes use of a main window and side panels, would be a case in point. Microsoft Excel achieves a similar effect with tabs.

Another method which might strike a chord with young learners is to break down the workflow or production process into steps, as in the case of Microsoft Photo Story. Program features are gradually made available to the user as s/he works his/her way through the task. This approach could be likened to that of teaching a foreign language, in which the teacher creates, fulfills, and then anticipates the learner’s linguistic needs.

6.4 Summary

Highly utilizable and useable programs for young learners are not as difficult to come by as it might seem, but work with them must be done on a regular basis. Without frequent use, young learners will practically have to relearn the program every time they use it. As a result, it could be argued that under the tight time constraints prevailing in the EFL primary classroom and the school lab, multimedia authoring programs should not be given preference to using learning software after all.

Nevertheless, as most primary EFL teachers are generalists who teach more than one subject, the only possible solution would be to have them incorporate the same MAP into learning situations other than English, such as art or German lessons. And since MAP packs much more versatility than learning software does, applying it with different subjects should not present any problems.

7. The task: producing a talking book

This chapter will provide the "missing link" between using multimedia authoring programs, recommended here as the preferable ICT-based resource for the primary EFL classroom in Hesse, and the opportunity it offers to work on topics children have covered in their textbooks.

> "Maybe there is more you can do, I don't know. Maybe in the future you can, I have no idea of when some things work, you could sort of maybe create pictures and they have to find a sentence to go with pictures to create their own story, or I don't know. I mean, there are definitely possibilities" (Gerngross 2008: 40'41'').

Language

The good news is that such a possibility has been around for several years. Interestingly enough, talking books are called *Bildgeschichten* or *Bildergeschichte*n in German, thus emphasizing their visual, rather than aural, quality. In either case, producing an audio-visual book requires the pupil to use the listening and speaking skills of a storyteller rather than the reading and writing skills required for authoring a storybook. Pupils whose capacity to express themselves in the foreign language is limited can achieve considerable satisfaction by using pictures to fill lexical and functional gaps (conceptual thinking and visual literacy).

Creating talking books is one of the most common uses found for multimedia authoring programs in primary schools in England.[25] The Primary National Strategy has come to acknowledge the importance of speaking and listening as essential elements in literacy development and conceptual thinking and has moved towards a recognition of the importance of visual literacy (Fox 2007: 1).

Textbook

Talking books resemble animated audiobooks. An audiobook is a recording of a text read aloud by a narrator. Talking books take a more liberal approach towards

[25] With EAL – English as an Additional Language – and MFL – Modern Foreign Languages – learners

the narration of texts and their graphic interpretation.[26] Adding such elements as rhythm and chants can modulate the words spoken. By recasting an action story, photo-story, action strip, etc. found in their textbooks, children make the foreign words their own. Their talking books reflect the intricacies of the plot which have attracted their attention and captivated their imagination and help them express their individuality through a new form of communication. Therefore, it is important that the teacher does not dictate what parts of the story are to be depicted in the talking book. Such an approach can result in uniform products which might better serve the teacher's assessment needs than the children's right to free expression.

In this sense, a talking book will never be a paper-on-screen reproduction of the plot – it is always a derivative with some resemblance to the original.

> "Some people view multimedia programs or presentations as no more than a text book 'come alive', however one of the crucial advantages is that students and teachers now have much more control over the content of the textbook. They can choose what to access, foreground, add, change and insert. As such, they are no longer limited by the linguistic, cultural and physical ethos and resources of the classroom in what they choose to present" (Davies 2004: 14).

The advantage of adapting a story found in a textbook is that its language is already simplified.

Pupils

Children produce books with the aim of sharing their inner worlds with each other, which is what communication is all about. The finished product is the Holy Grail which provides the motivational drive. Later on it can be (dis-)played to the rest of the class, thus giving the children a well-deserved sense of achievement, and archived (e.g., for an e-portfolio).

The most significant benefit of producing talking books to supplement textbooks is that children are in the driver's seat throughout this creative process. Children will

[26] A few online examples of professionally made talking books could be found at www.candlelightstories.com/movies.php, www.scholastic.com/parents/play/stories/, www.storyplace.org/preschool/other.asp 08.06.2008.

feel free to express themselves in the foreign language in an environment open to experimentation, tolerant of errors and free of criticism. Moreover, children's individual experiences as *media producers* turn them from *media consumers* to *media critics* when watching talking books made by classmates and accessing new lexical and functional meaning (peer tutoring). This change of perspective should be taken into consideration if and when the teacher considers whole class activities based on (dis-)playing other pupils' work.

In parenthesis, it is worth mentioning that the idea of children as media producers correlates well with Lawrence (Larry) Lessig's, a Stanford Law School professor and founder of Creative Commons, idea of "read/write culture," more commonly known as "remix culture" (Lessig 2006: 195). Lessig is a proponent of legalizing digital mashups, media files which recombine and modify existing copyrighted material, instead of viewing them as a case of copyright infringement.[27]

Teacher

A successfully completed talking book can contain concrete evidence, which might have been otherwise unavailable, of children's speaking abilities. A voice recording can reveal deviations from standard intonation, inflection, pace and tone which can remain unnoticed and hence unaddressed during other speaking activities in class. Once those problems have been addressed, children may wish to reedit their talking books.

> "The finished book can be used as a focus for literacy and oracy work in English to support the child's return to using English in school after a period when they may have used it less. This is especially useful for younger pupils. It is a means to share experiences with peers and raise awareness of pupils' backgrounds, knowledge and skills" (Crowther, p. 13).

To summarize, focusing on pupils' narration could serve as the basis for making them more aware of how they can shape their speech. Additionally, they might be delighted in recording and listening to their own voices.

[27] Cf. www.ted.com/talks/view/id/187, 22.06.2008, a talk he gave last year on "How creativity is being strangled by the law."

Computer

Central to children's success of using computers to produce talking books is the involvement and dedication on the children's part as active producers rather than passive consumers. Interactivity, a key feature of any multimedia application, contributes to children's success because it requires them to grapple with task demands. A sound file, for example, can be clipped into shorter bites, its pitch can be altered, it can be attached to another sound files to create a soundtrack, and finally it can play in the background of a video recording. Classmates who have been watching this talking book alone, in pairs, or with the rest of the class can finally turn the volume off and try to retell the story from memory.

As gratifying as having some control over the unfolding of the plot might be, producing a self-made talking book which is also interactive might only complicate matters, as we will soon see with Microsoft PowerPoint. Here professionally made interactive animations, as in Playway Activity Book CD-ROM, offer quality which pupils would be hard-pressed to match. Nevertheless, engaging learners in language production and encouraging confidence hold the true didactic rationale for integrating work with computers into the curriculum.

8. Multimedia authoring programs for publishing talking books

This chapter provides an overview of a few multimedia authoring programs (MAPs), their utility (what they can do) and usability (what the learner can do with them) in the context of publishing talking books. We will start with programs which require well-developed computer skills, yet are known to be used for creating talking books, and end with programs which are more suitable for children.

Since Microsoft Windows is the most widely used computer operating system today, often coming preinstalled on new computers, the following sections will deal with three MAPs which are fully compatible with this platform: PowerPoint, Movie Maker, and Photo Story. The last two programs can be downloaded free of charge by owners of an authenticated Windows XP operating system. PowerPoint Viewer is offered for free, but the fully functional version has to be purchased (mostly as part of Office 2003 suite). However, one fully functional copy of the program should suffice. Once a talking book is ready, the teacher can use PowerPoint Pack and Go[28] to compress the presentation into a self-extracting file which can be installed and (dis-)played on any computer.

8.1 Microsoft Office PowerPoint

As surprising as it may first seem, PowerPoint is often used by teachers for publishing talking books based on pupils' interests or texts they are familiar with. PowerPoint is suitable for creating interactive presentations because the author can hyperlink media on one slide to play from any other slide automatically or on reader's cue. To make PowerPoint an even more powerful tool, Microsoft offers its Producer free of charge – add-on software which captures and synchronizes audio, video, slides and images for viewing in an internet browser.[29]

Nevertheless, PowerPoint is not a MAP in the strict sense of the term but a hypermedia presentation program. It allows users to move non-linearly between texts, images, sounds, videos and other elements in a fashion similar to surfing the internet. Hypermedia attempts to offer a learning environment which parallels

[28] http://download.microsoft.com/documents/australia/education/resources/tips_packandgo.htm, 10.06.2008

[29] www.microsoft.com/windows/windowsmedia/technologies/producer.mspx, and www.breeze.usu.edu/common/help/en/support/startmain.htm, 10.06.2008

associative thinking and it is therefore especially suitable for pupils who prefer to navigate between media in the order of their choice. As much as this interactive feature might be attractive to learners as media consumers, it has been argued in the previous chapter that it is of little consequence to them as media producers.

Stephen Woulds from Thomas Danby College believes that Microsoft tools are ideal for developing resources for students. He has posted on the Portsmouth Ethnic Minority Achievement Service website tutorials and materials for PowerPoint.[30] For additional step-by-step instructions on how to create a mouse-operated PowerPoint talking book, refer to the text and video tutorials.[31]

Mediaculture website brings an impressive example of a talking book made, according to the teachers, by grade three and four pupils.[32] Nevertheless, it is hard to believe that scanning the drawings, their embedding in and animation with PowerPoint could have been carried out without intensive involvement on the teachers' part. Since the production of *Fischgeschichten* was done as a class project, the teacher had obviously to break the process down into subtasks and allocate these to the children ("differentiation"). Once the parallel work on the different subtasks had been completed, constructing the presentation would have created a bottleneck at the computer, a situation which may turn chaotic without teacher intervention.

This approach to using ICT in class defeats the purpose of integrating computer skills into the curriculum because it leaves the computer-assisted work in the background. In the end children are not going to be more skilled at creating a PowerPoint presentation on their own, leaving the teacher in charge of similar tasks also in the future. In terms of lesson time, it is doubtful whether an EFL primary teacher could and should have her pupils spend ten hours on creating such a presentation.

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[30] CD-ROM > PowerPoint > How to > Woulds, and www.blss.portsmouth.sch.uk/resources/cdrom/index.shtml, 09.06.2008

[31] CD-ROM > PowerPoint > How to create > Bowdoin, and www.videojug.com/film/how-to-create-a-talking-book-in-microsoft-office-powerpoint-2003, 09.06.2008, author unknown

[32] CD-ROM > PowerPoint > Examples > Fischgeschichten, and www.mediaculture-online.de/Multimedia.759+M56f8ea22300.0.html, 09.06.2008

PowerPoint will not be appealing to a nine-year old. The user interface is crammed with too many small icons to be considered “child-friendly” and requires continuous use to master. Children don’t seem to use this program or any other similarly advanced program at home. The relative high-utility and low-usability of PowerPoint make work with it a time-consuming means of creating talking books.

8.1.1 Other uses to PowerPoint

An interactive revision of vocabulary is offered by Monika Wegerer.[33] This example of consolidating the lexical field of “weather” makes hotspots and hypertext to play a voice recording and display a text by clicking on a picture.

Another use to PowerPoint is creating whole-class games and quizzes (especially those which simulate television game shows such as *Jeopardy!*, *The Weakest Link*, *Wheel of Fortune*, and *Who Wants to Be a Millionaire?*).[34] Those activities are teacher-centered and should be therefore used critically. The teacher is the one who literally runs the show, an impression which might leave some pupils resenting the teacher’s self-appropriation of technology. As mentioned earlier, teachers should choose computer-assisted activities which reflect and promote pupils’ existing abilities rather than neglect or marginalize them.

To sum up, PowerPoint is a versatile program which allows the teacher to put together a rich multimedia presentation and revise material which has been covered in class. In the hands of a skillful teacher who wants to produce talking books for her class, PowerPoint is an attractive alternative to existing learning software and even professionally made talking books.

8.2 Windows Movie Maker[35]

Windows Movie Maker is a program for embedding digital video clips, images, sounds, music and narration in a combined file.[36] First, audio from a dictaphone,

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[33] CD-ROM > PowerPoint > Examples > Wegerer

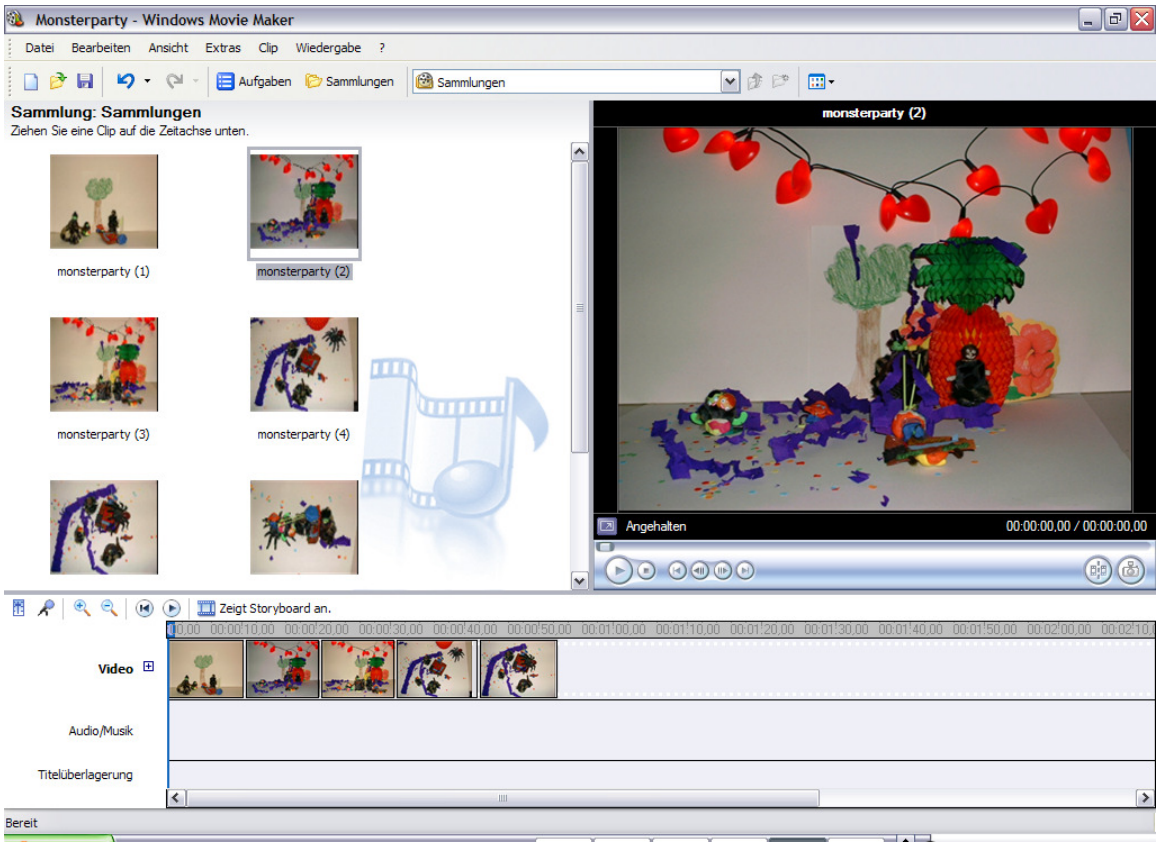
[34] CD-ROM > PowerPoint > Examples > Games

[35] A free alternative could be Slide Show Movie Maker, www.joern-thiemann.de/tools/SSMM/index.html, 21.06.2008.

[36] www.microsoft.com/windowsxp/using/moviemaker/default.mspx, and Windows Media Bonus Pack for Windows XP, www.microsoft.com/windows/windowsmedia/player/bonuspack/default.aspx, 10.06.2008

video from a camcorder, still pictures from a digital camera or any other media element are captured by the computer (“imported”). Afterwards, the sound bites, video footage, digital photos, downloaded images or scanned pictures are embedded in a Movie Maker project. The project can be then edited to add titles, video transitions, soundtrack or effects. Finally, it is saved to the hard disk or an external media storage device (“exported”) to be shared with others.

For the second face-to-face phase of our studies, I prepared a movie clip using Movie Maker.[37] The original intention had only been to capture a taped movie so that the unimportant footage could be edited out. Eventually, some text, music and visual effects were added. This investment of time and effort had not been planned – not a good practice when deciding to use computers in class – but working with the program and watching the movie with the classmates was a gratifying experience.



Ill. 8 Windows Movie Maker Source: Mediaculture

[37] CD-ROM > Movie Maker, 24.02.2007

Microsoft recommends having a 1.5 gigahertz or faster processor and 256 megabytes or more of RAM[38] – a standard recommendation with all multimedia applications (Karl 2007: 15). A computer with a processor double that frequency and RAM memory still grinds to a halt when capturing video from a camcorder, thus making it impossible to work with other applications at the same time. The teacher has to take into consideration that exporting a project file to a movie format (i.e., a WMV or MPEG file extension) can also take a considerable amount of time during which pupils will not be able to use their computers for other purposes.

Movie Maker is especially suitable for producing stop-frame animation movies. This technique is not covered here as its use of computers and the foreign language is limited then to only a fraction of the entire production process.

8.3 Microsoft Photo Story 3 for Windows

Much like PowerPoint and Movie Maker, Photo Story[39] comes with a storyboard and an impressive collection of transition effects between slides. Slideshow stories are constructed by cropping and rotating still photographs (or other scanned images), adding text, voice-overs, special effects and background music.[40] Children might enjoy experimenting with these the same way they would with trying out different fonts. Alternatively, they can use the built-in 'Create Music…' option and have fun trying out all kinds of musical instruments, moods and tempi (and they may need help focusing on the task at hand!). One very useful feature of Photo Story is that music lasts the length of the project so that the learner does not have to figure out how long it needs to be.

> "One word of warning when using sound; if at all possible the children should use headphones. Some of the most popular tunes they use will play in your head for the rest of the day and then haunt your dreams!" (Hyde 2008: 6).

There is evidence that eight-year olds have found the program intuitive and managed to complete a slideshow story using it (Fox 2007: 1). Bob Fox from the

[38] www.microsoft.com/windowsxp/downloads/updates/moviemaker2.mspx, 10.06.2008

[39] www.microsoft.com/windowsxp/using/digitalphotography/photostory/default.mspx, 10.06.2008

[40] CD-ROM > Photo Story > Examples

Institute of Education at the University of Worcester writes that the slideshow style of Photo Story is superior to the videos of Movie Maker as a storytelling medium:

> "In many ways I find this more powerful than video as a means of telling a story, because the viewer's attention is drawn to the particular moment in time captured by the image, and the narrative weaves detail and meaning around that specific moment; whereas with video any additional spoken narrative can often seem superfluous to the action on the screen" (Fox 2007: 2).

8.4 Producing a talking book with Photo Story

Offered here is a rough outline for publishing a talking book, possibly for summarizing a unit in a textbook (e.g., Playway Pupil's Book).

8.4.1 Preliminary considerations

Children need to be familiar with the rules for working at the computer lab. Rules are important because they instruct children how to avoid repetitive strain injury (RSI), reduce equipment wear and tear, prevent children from tampering with computer configuration, limit the amount of noise in the lab and promote cooperative and fruitful learning. A list of such rules (e.g., how often to save a project to the hard disk) could be hung at a prominent place in the lab.[41]

When the production of one minute of talking book can last as long as an entire lesson and even longer, sticking to a timetable is of great importance for making progress. Clear deadlines should be set to assure that children don't get sidetracked in their work. The production process should be broken down into steps with each one being covered in one lesson at a time; after a number of lessons the pupils should be able to present their final results. The more familiar children become with the production process, the more they can accomplish within one lesson and the better the teacher can plan her lessons.

The next point to consider would be what story, chant, poem, song, rhymes etc. the teacher would like to render as a talking book. The teacher should be guided by practical considerations, choosing a story which has proven to be popular with

[41] A list of "Ten Golden Rules for Work with Computers" provided by Claudia Mutter could be found at www.lehrer-online.de/regeln-computerraum.php, 10.06.2008

the children, a story which can be easily depicted, or a story which exploits and recycles language elements used throughout the unit.

> "All coursebooks have attractive features but equally they are all restrictive in some ways. It is important that teachers can take time to identify gaps in their coursebooks. Having done this, they can begin to adapt and rewrite materials to fill these gaps so that the book becomes better suited to their class" (Pinter 2006: 119-120).

8.4.2 Staging

Guided by their teacher, the children could decide whether to depict the story in drawings,[42] photographs, paper cuts, etchings, or any other two dimensional media which can be later scanned to the computer. Large picture banks of clipart are readily available on the internet and on CD-ROMs. The teacher is strongly advised against infringing intellectual property (IP) rights; she ought to get the publisher's permission to scan parts of a copyrighted textbook.

Alternatively, pupils could use paper folding, papier-mâché, handicrafts, play dough, modeling clay, Playmobil, Lego, replicas or other toys and techniques for their figurines. Those figurines could be set against the backdrop of a poster or an illustration in a children's storybook and then photographed with a digital camera. Since large backdrops are difficult to produce, it is best when the figurines are of relatively small and proportionally reasonable size.

Finally, the children could star in their own media production, which ensures a range of postures and facial expressions that toys and other figurines cannot recreate. In fine weather the children can wear costumes and use the outdoors as their set for a photo shoot. To make the session outside purposeful and prevent the children from messing around, the storyboard has to be worked out in advance.

8.4.3 Storyboard

Since children's metacognitive skills are not yet developed enough to be able to plan their storyboard first and then use it for staging (as with theater plays and movie scripts), it is better to start with collecting the images for the talking book

[42] Children can also use drawing programs, such as these freeware: http://drawing.gamemaker.nl, www.getpaint.net, and www.tuxpaint.org (open source), 21.06.2008

and then sorting them into what to take in and what to leave out. As much as this may seem time consuming, storyboarding would most certainly lead to a better talking book.[43]

There are a few approaches to creating a storyboard. One is to take the digital photos or scanned pictures, arrange them in the desired sequence in a PowerPoint presentation (one image per slide) and print them out leaving lines for comments. The children then use the lines to decide what the voice-over should say. If they are familiar with the zooming and panning effects of Photo Story, they may wish to trace on the printouts the effects these motions should create.

Another approach would be to allow half the class outside the computer lab to take or draw the pictures while the other half works on importing and editing the pictures at their computers in the lab.

8.4.4 Work at the computer

In the computer lab, or already in the classroom, the teacher can demonstrate with a digital projector how to work with Photo Story.[44] She should keep the introductory part to a minimum, just giving an overview how to use the program.

> "I then explained the task, showed the pictures and demonstrated the whole program in one go, including a short 'here's one I made earlier'. Twenty years ago I would not have done that – rather, I would have shown them how to do part of it, given them time to do that part, and then shown them the next part, and so on. I have found that it is quicker and easier to give an overview of the whole thing in one go, and then to answer queries as they arise. In this instance I had a couple of able student assistants, though neither of them had seen the program before the sessions started. Although many of the children I was working with were from relatively disadvantaged backgrounds, the majority had computer access at home, though none had seen the program before. No-one had any apparent difficulty understanding what they had to do, and no-one needed to be shown anything more than once" (Fox 2007: 4).

[43] CD-ROM > Photo Story > How to, and www.jakesonline.org/storytelling.htm, 20.06.2008 (storyboard forms)

[44] Alternatively, the teacher might wish to prepare in advance a tutorial the children can watch on their computers. Such tutorials could be produced using www.debugmode.com/wink/, and http://camstudio.org, 21.06.2008.

The teacher should let the children explore the range of possibilities offered by the program, all the while going around and making sure that they are on track to complete the task on time and that the voice-overs are as much as possible free of pronunciation and other errors.

8.5 Other proprietary multimedia authoring programs

Before making a case for using free software, it is worth mentioning in brief three proprietary programs which are often used at schools.

In the context of producing talking books in primary school two programs seem to be market leaders, especially in English-speaking countries: Clicker,[45] which comes with a wealth of additional material, and HyperStudio.[46]

A proprietary program popular among German teachers to create standalone hypermedia applications is Mediator.[47] It allows the production of interactive multimedia presentations and websites, dynamic HTML pages and flash projects. According to Mediator website, students as young as seven can use it.

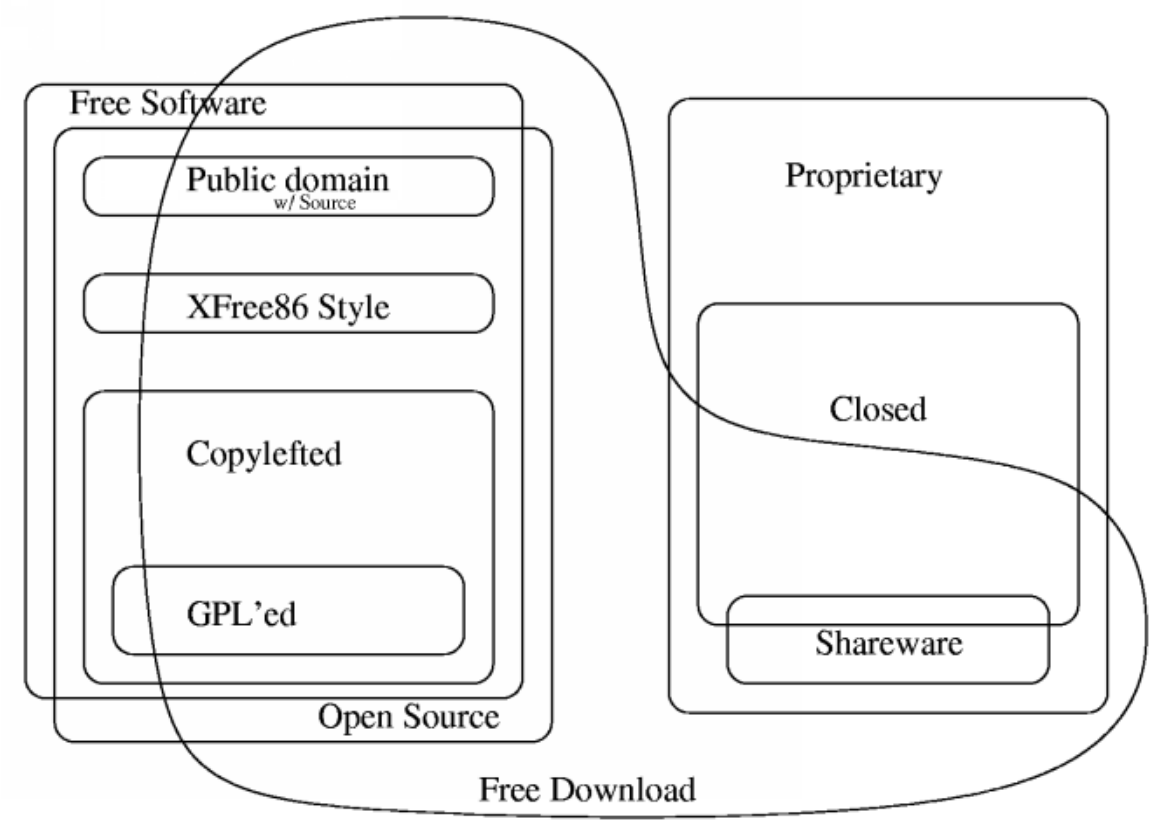
[45] CD-ROM > Clicker, and www.cricksoft.com/uk/ideas/using_clicker/talking_books.htm, 10.06.2008

[46] www.mackiev.com/hyperstudio/index.html, 10.06.2008

[47] CD-ROM > Mediator, and www.matchware.com/en/products/mediator. Examples could be found at www.matchware.com/ge/products/mediator/showcase.htm, 10.06.2008

9. The case for free software[48]

Free software comes with the permission for anyone to run, copy and (re-)distribute it (for free or for a fee) without restriction. In particular, this means that users have full access to examine, modify and improve the source code of the program. In short, the free software movement sees in the *freedom to read and alter* an existing source code without asking or paying for permission a case of the *freedom to create* an original code. The best-known example of free software is Linux, though in fact it is an open source program. As the diagram below shows, the two do not exactly overlap.



Ill. 9 The Different Categories of Software Source: Chao-Kuei[49]

Free software should not be confused with freeware, which is proprietary software made available free of charge but without the permission to study, modify or

[48] Cf. Guhlin, Miguel (2007): The Case for Open Source. *Techlearning*. [Online available at: www.techlearning.com/showArticle.php?articleID=196604245, 21.06.2008].

[49] www.gnu.org/philosophy/categories.html, 11.06.2008

redistribute it.[50] By contrast, free software does not automatically mean “software that is legally available for free” – some free software might be for a fee.

If a primary school were offered an unlimited supply of free textbooks, after the initial astonishment, suspicion would sink in: what might be the didactic value and the curricular relevancy of those textbooks? And for a reason: few publishers would even contemplate such a disastrous marketing strategy. Nevertheless, developing free software can do without many of the costs key to survival in the publishing industry. Free software developers for one do not need to contract marketing experts to herald the superiority of their product. Instead, it has to prove its worth by meeting users’ needs.

Computer users might shy away from using free software because of quality, security, and service issues. They either perceive it as a product of inferior quality (e.g., it cannot meet curricular requirements) or they suspect the motives of the program developers and distributors (e.g., that a product for free will later require upgrades or technical support for a fee).

9.1 Quality of free software

Partly-functional proprietary software is often offered for evaluation purposes for free. Evaluation software can be used for a limited amount of time (trial) or to a limited extent (demo). Consequently, work with the program has to be discontinued after a short while. The program has to be uninstalled, sometimes from several computers (with fat clients), often causing the deactivation or even loss of project data (similarly, document files cannot be accessed without having a word processor installed). It is only left to hope that the skills which have been acquired and the project files which have been created using the evaluation software will be used with a fully-functional version of the software or with other programs.

[50] E.g., StoryBoard Pro http://movies.atomiclearning.com/k12/storyboardpro/, StarOffice 8 Office Suite www.lern-staroffice.de, www.sun.com/products-n-solutions/edu/solutions/staroffice.html, and others which can be found at www.orbitdownloader.com/freeware-download/, 11.06.2008

Among other reasons, the irrevocable permission to use free software for free warrants its positive reception by learners. As mentioned earlier, although "free" does not refer to price but to rights, the former might appeal to decision makers at schools: "Primary schools could cut their computer costs by nearly half if they stopped buying, operating and supporting products from the world's largest software company [Microsoft], government research has found" (TES 2005). Perhaps an equally convincing argument for using free software is that these programs are mostly the result of collaborative grassroots initiatives.[51] The free software business model is a radical departure from the traditional commercial model for producing software. Free software business models are usually based on adding value such as support, training, customization, integration, and certification (e.g., Red Hat).

As the internet has allowed for rapid and inexpensive distribution of software, the quality of free software in the public domain has been constantly on the rise due to increased volumes of online traffic and collaboration. Even if some free software is inferior to its non-free alternative, programmers who like the idea could contribute to the project and get it off the ground. "In any case, examinations of many free software applications show that today they are as good as or better than equivalent non-free applications, or are reaching there fast" (Wikibooks).[52]

Alternatively, with a large group of end users it is a highly cost-effective practice to contract a software engineering company to take an existing piece of free software and customize it for the users' needs instead of developing an entirely new piece of software.

The free software model opens a communication channel between software developers and ordinary users. Accordingly, free software developers are often more aware of users' needs and the difficulties users have encountered while operating the existing version. This strong cooperation between developers and

[51] Nevertheless, large software companies also release free software, e.g., IBM's Lotus Symphony http://symphony.lotus.com/software/lotus/symphony/home.jspa, and Sun Microsystems' OpenOffice www.openoffice.org, 11.06.2008

[52] CD-ROM > VLC, and www.videolan.org/vlc, 19.06.08, is an example of free multimedia software for playing various audio and video formats which has gained tremendous popularity.

users assures that free software remains free of design decisions that prioritize marketing requirements over users' needs and compromise software performance. In addition, teachers are more likely to contribute their experience to improving free software rather than live to see their ideas increase the profit margins of a software house.

> “Designers should recognize that they are not typical users. They have more intimate knowledge and understanding of the system they are developing than the average user ever will. Aspects of the interface that are unclear or confusing to most users might therefore be perfectly clear to someone who has worked on the project. Some software designers are able to empathize with the average user to a degree, but there is no substitute for the real interactions of actual users with the product” (Microsoft 2000).

9.2 Security of free software

Free software betas (test versions) are usually released to the general public, whereas proprietary software betas go to a relatively small group of testers. On the other hand, updated versions are more frequently released than those of proprietary software (which are released in response to new developments in technology). The aforementioned strong cooperation between developers and users of free software also ensures that the program is continually updated to resolve or prevent software issues, often within hours after they are reported. Bugs are quickly fixed and security loopholes are quickly code-patched, saving the user time and money s/he would otherwise spend calling the proprietary software helpdesk.

> “Open-source proponents have long argued that their software is more secure due the exposure of the raw code to thousands of eyeballs, and the ability of anyone using the software to incorporate code changes to quickly patch vulnerabilities” (Salkever 2001).

The more popular a piece of software is, the faster it evolves. Therefore, only free software which reaches the stage of being in common use benefits from such intensive care. Bugs and loopholes in programs of little popularity are often overlooked, causing them to fall by the wayside into disuse. This ensures that only the deserving and useful programs get supported in this manner.

One could only wish that a similar process for filtering out dangerous websites were in place. Then surfing the internet would not expose children to the security risks they face today when they are online.

9.3 Service for free software

The argument that real-time support for free software rarely exists does not mean that users cannot get adequate support. It is true that only few free software maintainers can offer helpdesk support services. Users become quite agitated when a piece of software does not seem to work properly on their computer. Some would prefer to express their anguish on the phone by dialing a helpdesk number. This has often more to do with human psychology than with helping users operate the program properly.

Free software often comes with high quality documentation, e.g., a downloadable user's manual. Asynchronous (e-mail, internet forums and discussion groups) and synchronous (instant messaging, audio and video conferencing) communication channels for online collaboration and information exchange are often available. The programmers together with the users maintain a wiki website to report newly discovered bugs, submit bug fixes, post news of their own programming subprojects and read others' postings. The teacher can contact the maintainer of the software directly or via a dedicated forum to make suggestions how the software could be further improved (e.g., asking to make the software available in the local language, a process known as "localization").

Since the software itself is open, users are not bound to any particular support vendor. In other words, anyone could offer support for free software. Support could also be offered by an expert company or an in-house consulting team which works for the State Ministry of Education.

9.4 Finding the right software

On this occasion, it is worth mentioning seven websites which offer quality free software.

Program directories

The Free Software Directory[53] is a project of the Free Software Foundation (FSF) and the United Nations Education, Scientific and Cultural Organization (UNESCO). The website catalogs useful free software that is available under the terms of the GNU General Public License (GPL) – the most common free software license to date (also used by Wikipedia, the free online encyclopedia).

By analogy with the free and open source software development website SourceForge.net, *SchoolForge*[54] offers schools free software needed by teachers and students for their work and studies.

The *Informatikserver* website[55] is a platform for best-practice reports on the deployment of open source software in schools to promote its use among teachers.

Open source software alternatives to well-known commercial and freeware products can be accessed at *osalt.com*.[56] By browsing through software categories, the user can compare pros and cons of both commercial and open source software.

Open Source Living[57] offers an up-to-date repository of open source software, fully categorized, annotated and searchable. Additionally, the website aims to educate users about viable open source software alternatives to corporate funded, closed source software.

Software packages

Schüler-CD website[58] offers a CD with more than 30 free programs, put together by the *Berufskolleg für Wirtschaft und Informatik* in Neuss, which can be ordered online. Although this software package targets students in secondary and tertiary

[53] http://directory.fsf.org, 12.06.2008

[54] www.schoolforge.net, 12.06.2008

[55] www.informatikserver.at, 12.06.2008

[56] www.osalt.com, 13.06.2008

[57] http://osliving.com, 13.06.2008

[58] www.schueler-cd.de, 12.06.2008

education, it could also serve teachers' personal and professional needs. *Opensource-DVD*[59] offers three similar software packages.

Similar to Schüler-CD, *WinLibre* website[60] offers a free software package for Windows: office, internet and multimedia applications. Although there are fewer programs in this package than in Schüler-CD, it can be downloaded for free directly from the website.

Finally, the *Institut für Qualitätsentwicklung an Schulen Schleswig-Holstein* (IQSH) has put together a collection of free software, *Digitale Schultasche*, which could be run from a USB flash drive (≥1 gigabytes) as well as from a hard disk.[61]

9.5 Scratch

On May 15, 2007, MIT Media Lab (the same institute which the Free Software movement had emerged from a quarter century earlier) officially launched its Scratch free software and website.[62]

The name Scratch comes from the technique used by hip-hop disc jockeys of spinning vinyl records on turntables to mix music tracks together in creative ways ("remix culture"). Similarly, Scratch lets children (8 to 16 years old) mix together a wide variety of media – graphics and photos, music and sounds – to produce "from scratch" their own interactive creations – stories, games, music and animation – and share them with one another on the internet under the Creative Commons license. The Creative Commons license, established by Lawrence Lessig, permits the free distribution of content material, e.g., textbooks,[63] in the same way that the GNU license has made free software available without infringing copyrights.

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[59] www.opensource-dvd.de, 22.06.2008

[60] www.winlibre.com/en/index.php, 13.06.2008

[61] CD-ROM > Digitale Schultasche, and
http://medien.lernnetz.de/home/content/download_ds.php?group=30&ugroup=3, 21.06.2008.

[62] http://scratch.mit.edu, 14.06.2008

[63] www.opentextbook.org, 14.06.2008

Scratch cards provide a quick way to learn new Scratch visual code and are included in the Resource CD.[64] The front of each card shows what users can do with that specific visual code, whereas the back of each card shows how to do it. Additionally, new users can toggle between a German and English GUI, thus enhancing the learning potential of working with this program.

The distinction between authoring tools (e.g., Photo Story) and programming tools (e.g., Scratch) is not always a clear-cut one. Typically, though, authoring tools require less technical knowledge to master and are used to present, and sometimes even interact with, a mixture of textual, graphical and audio elements.

Ill. 10 Scratch Source: MIT Media Lab

According to MIT Media Lab, Scratch is a programming tool for children, making interactive creations possible simply by snapping together graphical blocks, much

[64] CD-ROM > Scratch > Cards

like LEGO bricks.[65] However, the claim made by Scratch developers that it is a full-blown programming tool has been disputed from the very beginning. In fact, Scratch has been often likened to Microsoft PowerPoint because of its dual interactivity: it is not only the story producer who cuts, pastes, drags and drops, but also the viewer can influence the outcome of the story.

One limitation of Scratch is that it cannot import videos. The video importing feature had been part of the beta version but it was removed because, according to the developers of the program, it was too confusing for new users. Nevertheless, it is possible to bypass this limitation by converting a video file into an animated GIF file and then importing the latter to Scratch.

[65] An example of a talking book in German could be found at http://scratch.mit.edu/projects/Victor/53043, 14.06.2008

10. Conclusions

As the bulk of this work has pointed out, the use of multimedia authoring programs (to produce talking books) is the preferable computer-based resource (for complementing textbooks) in the primary EFL classroom in Hesse.

> "It seems to me that at some point multimedia expression is going to be like writing: it's something you don't leave college without. Kids are very sophisticated in navigating on computers and surfing the Internet. I think pretty soon they're going to have to be as sophisticated in expressing themselves using the media" (Kann 2003: 40).

The main obstacles to using ICT-based resources in the EFL classroom have been outlined in the third chapter.

> "A popular view implies three main obstacles to the spread of these promising innovations:
> 1. The cost of ICT hardware, software and maintenance, although falling over the years, is still unaffordable to a majority of schools in many countries;
> 2. The (often unconscious) resistance of many educators to the intrusion of still obscure technological newcomers that threaten to alter drastically long-established and time-honored practices and customs; and
> 3. The lack of teachers who are trained to exploit ICT proficiently. Technology-rich curricula materials are therefore rarely implemented because students and teachers often have insufficient access to technology, and schools are unable to rearrange the curriculum to exploit the advantages of these materials" (Semenov 2005: 185-186).

Before making any more long-term decisions to invest in computer and internet equipment, it is vital that teachers are instructed in tried and tested methods of using computers to fulfill curricular requirements. Policy makers, on their part, should help teachers receive ICT training in media competence and not assume that they are as computer aware (of the potential of using ICT in class) as they might be computer literate (and know how to operate ICT equipment).

> "Verbesserungswünsche beziehen sich aus der Sicht der Schulleitungen, der Lehrkräfte sowie der Eltern weniger auf die Ausstattung mit besseren Geräten als auf qualifizierte Fortbildungsmaßnahmen, eine professionelle Wartung und einen zentralen Zugriff auf bewährte Software" (Herzig & Grafe 2007: 41).

As mentioned in the introduction to this work, teachers who are reluctant to use technology in class should not be forced to do so, as this might have adverse effects on their teaching. Nevertheless, they should be convinced that using computer-based resources can facilitate learning and makes sense when used correctly and critically. Yet it is not enough to win teachers over; to deal with the second obstacle mentioned in the previous page, *the State Ministry of Education has to anchor the use of computers in the primary curriculum*, as is the case with British primary schools.[66] Naturally, this will require a massive overhaul of the EFL curriculum itself.

The first obstacle of costs has been partly addressed in the previous chapter on free software and technical support. It will be further expounded on in this chapter.

10.1 The case against web-based activities

The first part of this thesis, citing studies of children's computer habits, has demonstrated that grade three and four pupils are ready for using computers. Nevertheless, it is doubtful whether this age group is ready for the internet, let alone in the EFL classroom. Since there isn't any indication that a computer with internet connection is superior to a standalone computer in the EFL classroom, using the internet mostly means putting an additional strain on the already tight schedule and budget.[67] As far as the IT-administrator is concerned, internet connection can considerably complicate the maintenance of computers at school (e.g., by requiring frequent anti-virus computer scans).

> "But at the moment you mustn't forget, especially in Germany or in most European countries, as far as I know, money is tight. The schools always complain about money" (Gerngross 2008: 8'35'').

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[66] CD-ROM > Curriculum, and http://clg.coventry.gov.uk/ccm/cms-service/download/asset/?asset_id=16070008; http://curriculum.qca.org.uk/key-stages-3-and-4/cross-curriculum-dimensions/technologymedia/index.aspx; www.standards.dfes.gov.uk/primary/publications/languages/framework/crosscurricular/, 14.06.08

[67] In fact, there is no indication that computers at school are of any didactic advantage over having no computers at all. The school as an egalitarian institute is obligated to offer pupils a level playing field. It can be argued that providing some kind of access to computers is school responsibility to the disadvantaged and the underprivileged, irrespective of the didactic value of such practice.

There are two types of activities children can carry out using the internet: those which could be carried out just as well without the internet (e.g., computer games, office utilities such as Google Docs[68]) and activities which demand advanced computer and language skills (e.g., retrieving information for a WebQuest, asynchronous and synchronous communication, website design).

E-mail exchange projects, which require advanced reading and writing skills, could be replaced with letters and postcards. It is unfortunate that some teachers insist on using the computer lab for e-mail correspondence. So much precious information gets lost with every e-mail – the postage stamp, the postmark, the handwriting. Since reading and writing in English are of relatively little consequence to that age group, e-mail correspondence demands intensive involvement on the teacher's part. Moreover, since spellchecking and typing skills are not taught in school, computers are used inefficiently to support this task.

Most pupils do not use e-mail clients (such as Windows Live Mail) at school and therefore have to type in their user name and password every time they wish to log on. Since they tend to forget or lose this piece of personal information, many of them end up sharing others' e-mail accounts. Pupils who share a computer at the lab and neglect to log off once their work is done risk having their e-mail account "hijacked" by others ("identity theft"). Spam is another e-safety threat when using web-based resources (Möllemann 2006: 11-13).

The second type of web-based activities demands advanced computer and language skills, for example, when searching for information online. Children at this age are unripe critics – they are not completely aware of the dangers hidden in their search results – and might consequently fall prey to online criminals. Web filtering software does not prevent pupils from accessing inappropriate information either (think of the efficiency of anti-spam software…) and it might even block appropriate websites. Additionally, using web filtering software is not going to teach children how to surf the internet at home or later in life, when they are deprived of such protective measures. Add to it the slow internet connection in

[68] http://docs.google.com. Interestingly enough, there is also a website which emulates Microsoft Photo Story, www.onetruemedia.com, 14.06.08.

most schools, and the teacher would be better off making the data necessary for completing the task available on CD-ROMs or computer hard disks.

> “Wer jedoch das Netz aktiv nutzen will, benötigt einen schnellen Internetzugang. Doch mit schnellen Netzzugängen ist es an Deutschlands Schulen schlecht bestellt… Selbst eine simple Netzrecherche kann da "Ewigkeiten" dauern. In der Sparte "Schnelle Internetzugänge" liegen Deutschlands Schulen auf Platz 21 von 27 untersuchten Ländern“ (Krüger 2006).

Children are not taught to drive cars, no matter how many precautions we can take to protect them. Instead, we drive them ourselves. It is not because driving is bad as such; it is because driving is too dangerous for them. In a similar vein, they should only be allowed to surf the internet once they are experienced and mature enough to tell appropriate and inappropriate content apart. Since many parents look to school authorities for guidance in educating their children, perhaps this is a message worth spreading.

10.2 Dealing with the limited number of computers at schools

The relation between the learning environment (location and time) and the use of computers in English class has surfaced a number of times in this work. Computers in sufficient numbers (one computer per pupil or two) are almost always confined to a single room at school, the computer lab. Therefore, doing computer work outside the classroom is a necessary evil which makes it difficult to integrate ICT-based tasks in English lessons. After all, not all computer-based tasks lend themselves to be squeezed neatly in a 40-minute sitting at the computer.

Having computers in the classroom in sufficient numbers would make it possible to integrate ICT-based tasks in English lessons. Unfortunately, the space occupied by a desktop computer (fat client), the major ICT device in schools today, makes such a possibility impractical. Equipping every classroom with 20 desktop computers might not leave much room for movement. Activities such as dancing, role-playing and games, the very essence of EFL lessons, would have to be done outside the classroom.

> "We need, let's say, to sing together. You've got a song; you could have it on the screen, but it's still easier to have it in the book. We need to do chants together and role-plays which is interactive, so... But I don't think [the computer] it's sort of something that will completely replace books in the near future, I don't think so" (Gerngross 2008: 53'26'').

The reality of having the computers at school confined to the lab has encouraged principals, IT-administrators and teachers to take a step towards having computers in every classroom (Möllemann 2006: 17-18). With computers in sufficient numbers being beyond the reach of most schools, the middle-of-the-road solution has been to make computers accessible outside the classroom and school hours. Some schools have placed workstations in shared areas such as the school hall. Often these workstations are either bookable by individuals or available to pupils on a first come, first served basis. "They have set up the computers in an open space, which is not a classroom, and during the breaks kids can sort of use a CD-ROM" (Gerngross 2008: 3'40'').

Unsupervised work

1. *Wochenplan*: pupils follow a schedule and take turns at the computer.
2. *Freiarbeit*: a more relaxed form of the *Wochenplan* which does not require but allows work at the computer. "There's a time where the kids decide what they want to do and how they want to do it, there's just some objectives" (Gerngross 2008: 18'21'').

Supervised work

1. Carousel learning: one or more computers are at the center of one or more of the activities.
2. Project work: work with computers is allowed at any given stage of the project. Children who have access to a computer at home may use it for completing their share of the project.
3. Computer *Arbeitsgemeinschaft* (*AG*): a teacher or a parent supervises the use of computers at the lab. Work with computers is mostly done as an afterschool enrichment activity rather than as a part and parcel of the curriculum.

10.3 From textbooks to notebooks

Having computers in sufficient numbers in the primary EFL classroom will not only free the teacher and her class from the need to go to the computer lab and back, it can also increase dramatically the range of applications found for computers.

> "Deutsche Computerräume sind in aller Regel abgeschlossen. Zutritt gibt es nur nach Voranmeldung. Dabei gilt laut Infratest-Studie folgende simple Regel: Je leichter Computer für Lehrer und Schüler erreichbar sind, desto häufiger werden sie im Unterricht auch eingesetzt" (Krüger 2006).

In the previous section we have seen that language and computers can be mutually exclusive when trying to accommodate 20 stand-alone computers in a single classroom. "And it's also a question of space, you know… Classrooms are usually not big enough, there's not enough space" (Gerngross 2008: 20'00''). The solution which often comes to mind is using notebook computers.[69] However, in this learning environment pupils don't have their laptops with them all day long; when a class is over, pupils dock their laptops to a special cart and wheel it to the next classroom.

In 2000 the former Federal Minister of Education, Edelgard Bulmahn (SPD), announced that by 2006, each of the 10 million students in Germany would be equipped with a laptop. Additionally, Bulmahn expected companies to donate 1 million used computers to schools. In 2006 both initiatives reached only 1% of their initial goal (Karl 2007: 15, 24, 27; Krützer & Probst 2006: 6).

The UK, on the other hand, has seen in recent years an increase in the availability of laptops and wireless networks in primary schools (Kitchen et al. 2007: 36). To retain their portability, it is sensible to use WLAN-enabled laptops to connect to the internet. Using cables instead could cause children to trip over and fall.

> "There are not many classrooms I have seen where you have got 20 laptops and the kids can access them whenever they want to. But if this happens and they use more of the software, this would more go into the direction of, sort of, each kid finding their own way

[69] A well-rounded discussion about one-to-one computing can be found throughout Herzig & Grafe 2007, and www.det.wa.edu.au/education/cmis/eval/curriculum/ict/notebooks/, 15.06.2008

and the teacher would become more a facilitator and less an instructor" (Gerngross 2008: 7'47'').

The disadvantages and virtues of using laptops in class both stem from their size. Laptops can be easily dropped, fall apart, knocked out, get soiled and wet.[70] Compared to desktops, laptops are difficult to upgrade and exhibit high repair costs, thus necessitating their frequent replacement. Laptops prioritize energy efficiency and compactness and therefore deliver lesser computational performance than equally expensive desktops. However, with the advent of multi-core processors, laptops are beginning to close the performance gap with desktops.

Having notebook computers at school raises some questions: should children be allowed to take "their" laptops home? Critics who object to this idea, citing the dangers of theft and tampering with laptop configuration, should be reminded that computers can foster self-directed and lifelong learning in children and can help those who don't have a computer at home close the digital divide.

Finally, it all boils down to the question how to finance all of this?

10.4 From procuring to leasing

Leasing computer equipment, a practice common among German companies, is a sustainable alternative often overlooked by school authorities.[71] Leasing, which is limited in time, is especially suitable for using notebooks, which are difficult to upgrade and exhibit high repair costs. New notebooks could be leased once the old ones have been returned to the leasing company (which can then re-lease them to another school or company).

A school which has been gradually equipped with computers as the necessary funds have been released will end up with computers of disparate quality. Leasing makes the desired amount and type of computer equipment affordable at once, guaranteeing that all of it is of consistent quality.

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[70] Also here solutions have been devised, such as the GammaTech DURABOOK.

[71] Leasing computers in Hesse is done through the Schule@Zukunft initiative.

> “Für die Beschaffung und Verwaltung dezentraler IT-Systeme gewinnt Leasing als kosteneffektives Werkzeug zunehmend an Bedeutung, da immer kürzer werdende Innovationszyklen bei Hardware und die entsprechenden Anpassungen im Bereich der Anwendungssoftware gekaufte Anlagegüter schnell zu einer Belastung werden lassen” (Kroll 2005: 99).

In the face of ever-changing policies and attitudes toward the place of ICT in the curriculum, using the services of a leasing company enables schools to adapt themselves much faster to a new reality while keeping their budget intact. The State Ministry of Education might take a new approach to using ICT in class; some schoolteachers might oppose the idea of integrating computers into their lessons; other teachers might wish to lease additional computers for private use.

Another upside of using a leasing company is that it offers a range of complementary services such as replacing malfunctioning computers, advising on software procurement and training of staff.

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Appendix 1: interview questions[72]

1. Do you know how many primary schools in Hesse use Playway?

2. What is your attitude toward the actual use and the potential of using computers and the internet in English lessons in primary school? Is there room for improvement, or enough has already been done?

3. If we take a few factors into account, for example, time spent on an activity, the self-satisfaction pupils derive from doing it, and the quality of the final product, would you rather see a class use pens, scissors, and glue with your book or a class which works with a digital version of the book using computer software?

4. Since software can be designed to be interactive and adaptive, should that affect in any way the role of the teacher in class?

5. To what extent were you involved in designing and developing the CD-ROM which is included in the Activity Book Playway 3 and 4?

6. Where did you get your ideas for the CD-ROM?

7. Does the CD-ROM make better or worse use of pupils' skills than the book? For example, social interaction, learning styles, physical activity.

8. When you were planning the content of the CD-ROM, did you have certain external constraints, for example budget, time?

9. What about some self-imposed constraints? Did you limit yourself in any way, for example in order to prevent the learning software from upstaging the book?

10. To what extent is the CD-ROM dependant on the Activity Book? Is the CD-ROM subordinate to the book, or perhaps the other way around?

[72] The interview with Professor Günter Gerngross, found on CD-ROM > Interview, took place at Frankfurt Airport in the evening of 11.04.2008.

11. When designing a book, the author makes certain assumptions about the competencies of its audience, for example, that a child is able to read. Did you make any assumptions about children's computer skills when developing the learning software?

12. Did you assume that those computer skills would be acquired at home or at school?

13. Is the design concept of learning software should be different from that of textbooks? For example, when considering what might attract boys and girls, motor skills and manual dexterity?

14. Is the CD-ROM meant to be used mostly at home or at school? Alone in the media corner, with a peer in the computer lab, or presented to the class with a digital projector?

15. For how long should the CD-ROM be used in one sitting?

16. If money, time, and energy were no object, would you like to see additional, or altogether different, features on the CD-ROM?

17. Are you planning to put one day some material from the CD-ROM on the internet, for registered users who pay a license fee? Why yes/no?

18. Your ordinary, run-of-the-mill, primary school teacher has neither the time nor the knowledge to develop any learning software which comes even close to the sophistication level of the Playway CD-ROM. Do you think that there still might be room for teachers who want and can develop additional materials to do so? Or was the learning software conceived with the idea of freeing teachers from the need to supplement the book with their own digital resources?

19. Do you believe that one day learning software will completely replace books?

ERKLÄRUNG

Hiermit erkläre ich, dass ich die vorliegende Arbeit selbständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe.

Frankfurt am Main, 24.06.2008