FABULA: A BILINGUAL MULTIMEDIA AUTHORING ENVIRONMENT FOR CHILDREN EXPLORING MINORITY LANGUAGES

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ABSTRACT

Fabula, an interdisciplinary project funded by the EU Multimedia Software programme, provides software to enable children learning European minority languages to create bilingual digital books. We share a set of assumptions and approaches to the key issues addressed by the project. First, bilingual books are a powerful teaching tool of great value in multilingual classrooms. Second, the graphic design of books has important effects in finding inventive solutions to problems. Third, multimedia can enrich bilingual books. Finally, self-made materials motivate children. These assumptions led to a general definition of the Fabula software: an easy-to-use software environment for making and viewing interactive multimedia bilingual books, concentrating on "languages of lesser diffusion." The language pairs we currently cater for are Welsh/English, Irish/English, Basque/French, Catalan/Spanish and Frisian/Dutch. We shall present a brief description of the Fabula software and discuss the ways in which it has been used in schools in Europe. We shall also set out our future plans for Fabula, including a Europe-wide competition for schools and the creation of a WWW-based "on-line library" for teachers and children who use the Fabula software.

INTRODUCTION

Minority languages suffer from a dearth of electronic media suitable for children, whether for language learning or for general use. The market for multimedia products in minority languages rarely justifies the outlay required from developers and publishers. However, the availability of electronic media can be a powerful motivator for young people in particular, to develop and maintain their knowledge of a minority language which might otherwise be overshadowed by more glamorous media products in the more widely used languages.

Fabula is a multidisciplinary, multinational project, initially funded by the European Commission, which goes some way to repairing this lack. In its two-year development phase, it involved teachers, children, software engineers, information designers and translators, together with academic researchers in linguistics, education, human-computer interaction and typography. Partners in England, the Basque country, Catalunia, Friesland, Ireland, and Wales set out to produce a simple-to-use tool for making bilingual multimedia story books in the lesser used languages of Europe. The aims were twofold: to help ensure that minority languages were not excluded from the Information Age and to increase the perceived status of lesser-used languages by associating them with new technologies.

This paper offers a brief description of the development and evaluation of the Fabula software and the ways in which it has been used in schools in Europe. We also set out our future plans for Fabula, including a virtual library of multimedia books for speakers and learners of minority languages.

Assumptions of the Fabula Project

The partners in the Fabula project shared a set of assumptions and approaches to the key issues addressed by the project. To begin with, we had a shared belief that bilingual books can be a powerful teaching tool. At a pragmatic level, those of the team experienced in language teaching in the UK context had long been convinced of the value of (paper-based) bilingual books for strengthening the position of minority languages. They had recently published a book of design guidelines for teachers thinking of using such books in the classroom (Edwards & Walker, 1995). Although the language learning setting in some of the other partners' regions was rather different, with an emphasis on foregrounding the minority language in a monolingual school setting, teachers in each region were open to experimenting with this new tool.

We also believed that the graphic design of books, paper or electronic, has important effects. Designers of paper-based books have struggled to find inventive solutions to problems such as how to position text in both languages on a page without suggesting that one is more important than the other. These details are noted by children given bilingual books as educational material, and influence their attitude towards the languages in question, often negatively. Enabling children to create products that are aesthetically pleasing is an important goal.

We shared the view that multimedia can enrich bilingual books. The specific stimulus for the project was the belief that creating digital versions of bilingual books can at once enrich the books by adding audio and other interactive elements and also solve some of the design problems connected with the paper medium. In addition, and importantly, digital books will give minority languages the high status attached to computer-based material and give children enjoyable, engaging language learning/exploration tools.

Finally, we believed that self-made materials motivate children. Some of the most successful of the paper bilingual books had been created by the children themselves, illustrating the constructionist approach to teaching, which holds broadly that creating an artefact is a more powerful way of learning than consuming another's product (Druin & Solomon, 1996; Jonassen, Peck, Wilson, & Pfeiffer, 1998). The active involvement of the children as collaborative creators rather than consumers is central to the successful use of the software in classrooms. An important practical spin-off is that these projects produce minority language materials for use in other teaching situations.

These assumptions led to a general definition of the Fabula software: an easy-to-use software environment for making and viewing interactive multimedia bilingual books, concentrating on European "languages of lesser diffusion." The language pairs used in the development phase were Welsh/English, Irish/English, Basque/French, Catalan/Spanish and Friesian/Dutch. The software consists of two integrated components: a simple multimedia authoring environment (the Fabula Maker) enabling users to create pages of text and graphics, plus interactive elements; and a browser-like environment (Fabula Reader) for reading and interacting with the products of the Fabula Maker.

The Fabula Software

In the development phase, the project had two main objectives. The first was to develop a tool sufficiently usable and flexible to meet the needs of teachers and children producing their own bilingual multimedia materials in a range of different settings. Several multimedia applications were already available and were considered for use: high-end professional programs like *Macromedia Authorware* and *Director* can be found alongside others such as the Learning Company's *KidPix* or *StoryBook Weaver,* which are more likely to be available on a school budget. However, the more sophisticated programs require relatively advanced technical and design skills to create a reasonable result. The lower-end products, while easy and fun to use, tend to encourage the use of prepared graphic and audio material with an unmistakably U.S.

flavour. In addition, localised versions of whatever software we produced would be essential, and while authoring packages exist in the major languages, the lesser used languages were not well catered for, and the code of the packages would not have been available to us for localisation. In contrast, we envisaged Fabula as an easy to use tool which would draw on the principles of best practice for screen based learning materials and be designed specifically to meet the needs of bilingual children and teachers in a number of different countries. This objective has now been achieved: the authoring and browsing tools are currently available in the project languages on CD-ROM (for schools which are not yet online) and can also be downloaded free of charge from the Fabula Web site: www.fabula.eu.org.

The early thinking on the project assumed a scenario in which an adult professional -- likely to be a teacher or a translator, or possibly a commercial publisher -- would create a second language version of a pre-existing monolingual text for display in the Fabula Reader. Alternatively, we thought the teacher might take an existing bilingual electronic book in one pair of languages and substitute her own language version for either one or both original languages. The bilingual product would then be given to the children. The team's thinking on this point evolved, however, and the scenario we worked toward was of children being involved in creating bilingual storybooks, probably from scratch, using their own graphic material. This assigns children a more active role and is in line with current best practice in bilingual classrooms.

The decision to target children as users of the Fabula Maker as well as the Reader meant that it had to be straightforward and simple to use. Maker is used to assemble multimedia objects, acquired for instance from a scanner, digital camera, or audio CD, into an electronic book. We have not attempted to build in media editing facilities (word processor, drawing package, sound editor) as these are available relatively easily elsewhere. There are two screen areas for text, one for each language, to be assigned as the user chooses. Users can add various types of interactivity, such as in the form of links from the picture to media objects such as sound files (containing spoken dialogue fragments or recorded sound effects), labels, or speech and thought bubbles (containing text). In addition, users can place links between a word or phrase of one language and its equivalent in the other to create a kind of simple guessing game for any child reading it. Links can also be made from individual words to a bilingual glossary for the book. If a spoken version of the entire text in a text panel has been recorded, this can be linked in via a special button on the relevant text panel (Figure 1).

The overall look of the package is quiet and plain. Our aim has been for the software itself to melt into the background and become "invisible," that is, so easy to use that it does not present itself as an object of interest in its own right. Perhaps controversially for a children's software package, there is little room to experiment with font styles, border patterns, or background colours. While the graphics imported into the package may obviously be of any kind the user chooses, once inside the package the choices for fonts and backgrounds are strictly limited to a single set of colour combinations and fonts that "work." We hope that this will enable our users to produce high quality products with the accompanying satisfaction that this gives, while avoiding the confusion and the "where do I start" feeling often aroused by more open-ended software (Druin & Salomon, 1996).
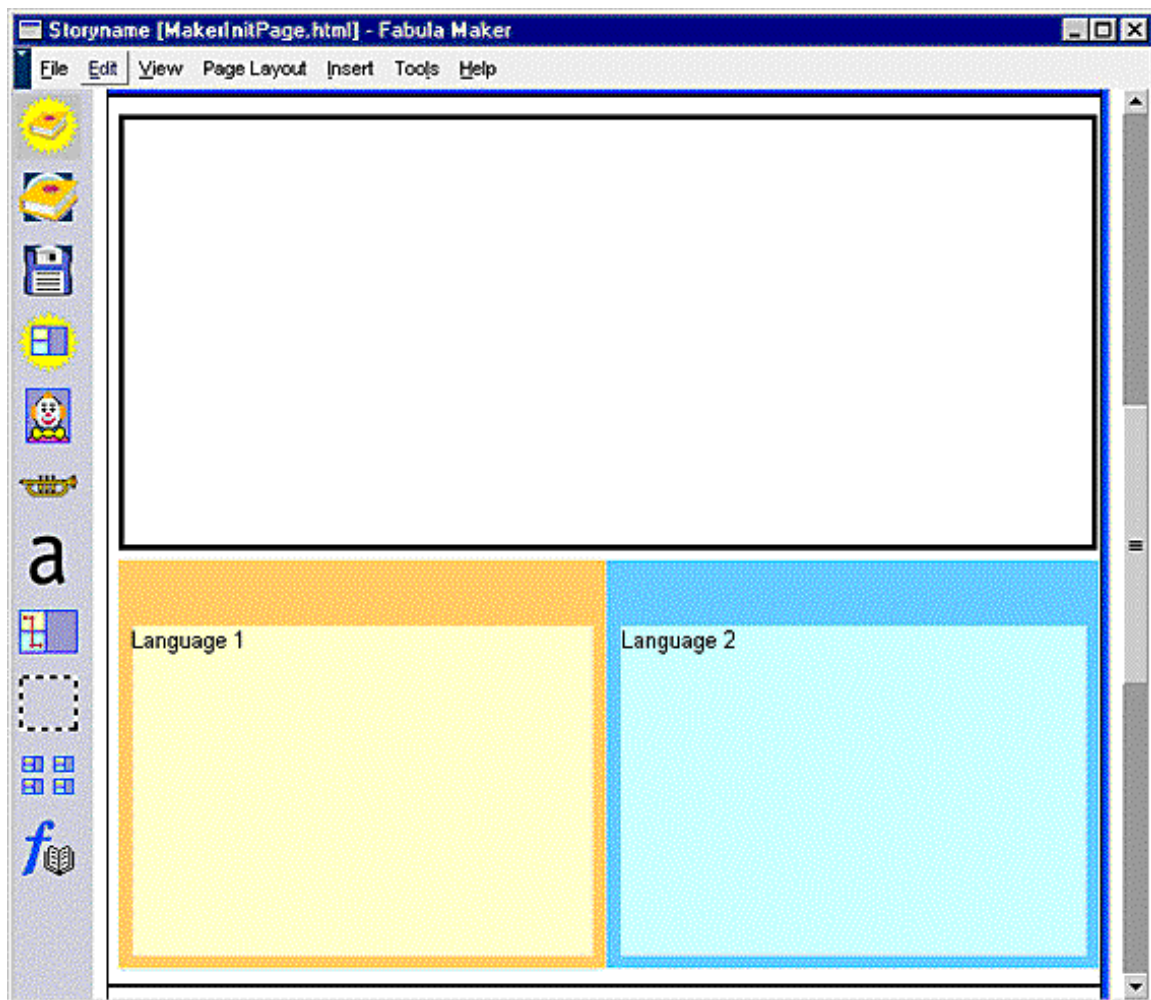
Figure 1. The Fabula Maker window

The Reader stands in the same relation to the Maker as a Web browser to a Web authoring programme. Here a reader can page through the book, explore the interactive elements of the pictures, look words up in the glossary and try to work out which parts of the version in one language correspond to the other version. A more passive use is to click the "Read to me" button on the title page, which takes the reader from page to page as a spoken version of the book is read out in the language of the child's choice.

Documentation and Training

The second objective was to disseminate guidance for teachers intending to create, repurpose, and/or use bilingual multimedia material. The software is accompanied by user documentation and includes information on how to do things such as taking digital photos or digitising sound recordings that are outside the scope of the project, together with teaching tips on how to integrate the programme into classroom practice. This teaching advice has been developed in collaboration with teacher partners in the participating countries. Workshops were arranged in each of the five countries involved to introduce it to an even wider base of teachers and thereby to establish a community of expert users. The project web is also important here, as a focus for discussion by users of the software.

FABULA IN USE

The following section describes three examples of the ways in which Fabula has actually been used in schools. We have deliberately chosen this case study approach so as to highlight not only the different benefits associated with bilingual digital stories, but to draw attention to the ways in which these benefits mutually reinforce each other.

Zaunka ari zen gatua (The Cat That Barked)

Errobi Ikastola is a small four-class school in Cambo les Bains in the Northern Basque country. The teachers' salaries are paid by the French government, but the buildings and other resources are funded by a co-operative of parents and teachers anxious to provide a Basque-medium education for their children. Although the teachers in the Ikastola had very little experience of IT at the start of the project, they embraced the opportunity to use the Fabula program with great enthusiasm. They were particularly adept at enlisting the help of other members of the community when faced with gaps in their own knowledge and experience.

The Fabula story was developed with a class of 8 - 10 year olds, co-taught by Lilian Hirigoyen and Janine Urruty, as part of work on narratives and the structure of stories. The children were put into groups of two or three and asked to analyse the underlying structure of *A Lovely Bunch of Coconuts,* a conventional picturebook by English writer Dennis Reader (1991) that had been repurposed as the first Fabula story in order to give children and teachers a taste of what a bilingual digital story might look like. In a subsequent session, they were asked to write their own stories in Basque using a similar structure: introduction of the characters, setting a problem, saying what happened, providing a resolution, giving the tale a twist. The children then read each other's stories and voted for the best draft.

The winning story was *"Zaunka ari zen gatua" (The Cat That Barked).* Bintu the cat drinks a magical potion and starts to bark like a dog. He sets off to find the old man of the mountains to help him get his meow back. When he gets back he finds that something else has changed After h aving chosen the story, the whole class worked on improving it together. At this stage, the teachers encouraged the children to enrich the language, focusing in particular on connectors and adjectives. Once the Basque version of the story was complete, it was sent to another class, who translated it into French. The story was then read by a class of 6 year-olds with less well-developed Basque language skills, who drew the illustrations.

The children now had access to the ingredients for making a Fabula storybook (Figure 2). The specially commissioned illustrations were scanned and made into jpeg files and the two older classes made digital audio recordings of both language versions of the story. The older children then combined the story texts, audio recordings, and images into a full Fabula storybook. The entire story-making activity took around one month to complete from initial analysis and drafting to implementation with the software. The bilingual "Cat That Barked" storybook has subsequently been used as the basis for a range of language awareness lessons with the younger children. Another inter-class activity involving the older children was used to develop a bilingual wordlist to accompany the story.

Figure 2. Fabula storybook version of *Zaunka ari zen gatua / Le chat qui aboyait*

Stori Branwen (The Story of Branwen)

The second example comes from St Illtyd's Roman Catholic Primary School in Swansea, South Wales. In Wales, both English and Welsh have equal status for official purposes. Small but growing numbers of children are educated through the medium of both Welsh and English in *ysgolion Cymraeg,* or designated Welsh schools. However, even in English medium schools, Welsh forms part of the National Curriculum and by 1999 almost all pupils between the ages of 5 and 16 were studying it either as a joint or a second language (Peate, Coupland, & Garrett, 1998). St Illtyd's is an English medium school where children learn Welsh as a second language.

As was the case for Errobi Ikastola, the children at St Illtyd's were centrally involved in the planning and creation of a bilingual, multimedia story. The class had been working on a school drama project developing their own play based on the ancient Welsh myth of Branwen, and a group of children from the school had been involved in performing the play in the Millennium Dome in London. The children had all written their own English version of the story and it was decided that this would form the basis for a bilingual digital story using the Fabula software (Figure 3).
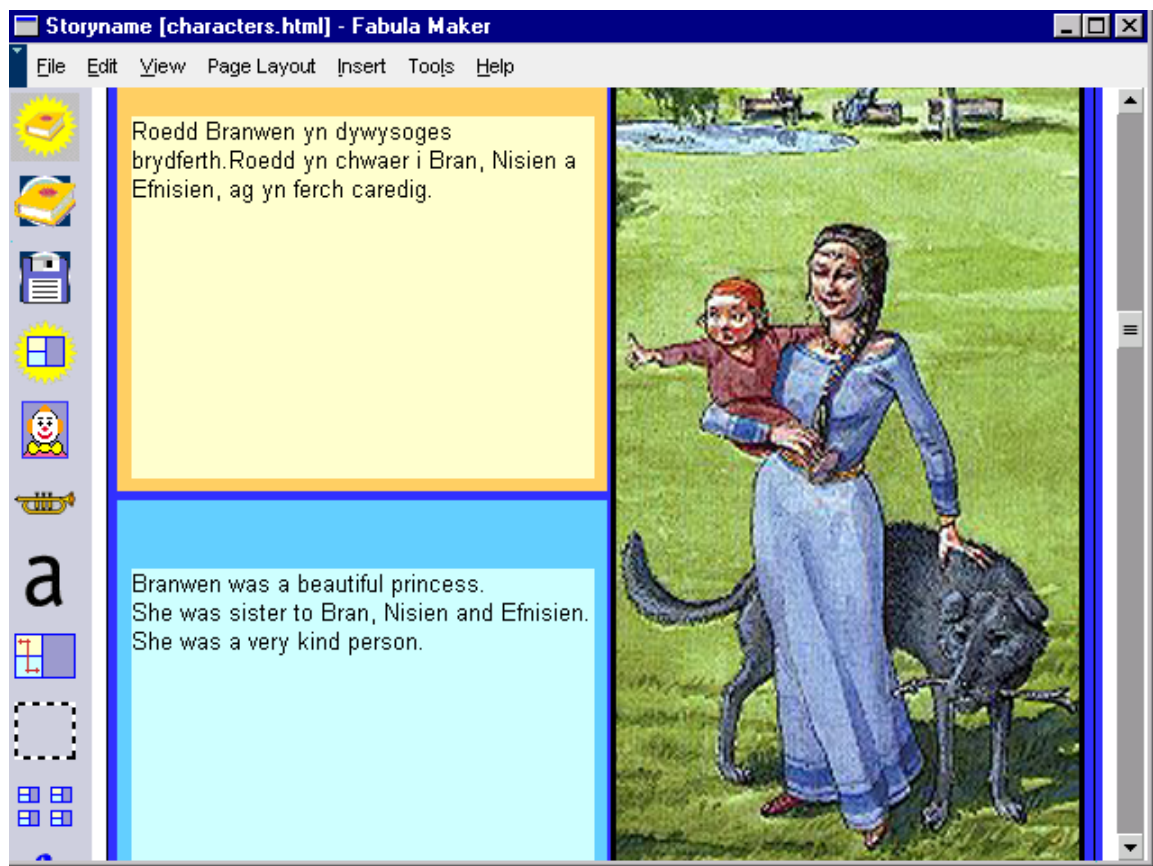
Figure 3. *Stori Branwen / The Story of Branwen*

Agreement was reached on which were the key scenes in the story. The children divided into groups with each group taking responsibility for a scene. They also discussed the layout of the page, the sounds they could use and how they would produce them -- battle raging; cauldrons cracking; waves breaking; gossips whispering, and so forth. The realisation that they would need to produce a Welsh version had the effect of focussing their minds on the English text. At the outset they were only thinking in terms of vocabulary. They saw their task as finding any unfamiliar words in a Welsh-English dictionary. As things progressed, however, they realised that they needed to find equivalents not only for individual words, but also for idioms and grammatical structures and that, in many cases, they lacked the linguistic resources to be able to find appropriate translations. This led them to find other solutions. They realised that the task was more a process of parallel authoring than translation, where the English text needed to be driven by their existing knowledge of Welsh. This process can be illustrated by looking at the first and second drafts of one of the pages of the story:

> Bran went to the battlefield with 500 men. You would be able only to hear "For Wales!" and screaming. Mofuloch waited with 500 men also. Wales were behind because Ireland had the cauldron of rebirth so Nisien tried to smash it, but he died. The battle was tiring, long. Blood stained the grass and bodies scattered the battlefield.

This early draft is the product of native speakers of English with little sensitivity to the main structural differences between English and Welsh. The final version embodies a much more realistic view from the children of what they could achieve as learners of Welsh as a second language at their current stage of development:

> The battle had begun. Ireland had the advantage because of the cauldron. The battle was long, tiring and bloody.

Interestingly, it is possible to argue that the final draft of the English version is a more focused and more coherent structure. In this sense, the exercise of producing a bilingual story is also incidentally providing support for writing in the children's first language.

Annwyl Fferm (Dear Farm)

The third story was developed in a Swansea school where children learn Welsh as a second language. Sharon Davies is the teacher of a class of 5 - 6 year-olds. Because she was working with younger children, she decided to take a more structured, didactic approach than the teachers in Errobi Ikastola or St Illtyd's. She began by reading *Dear Zoo,* a well-known children's book by Rod Campbell based on highly predictable patterns of language:

> I wrote to the zoo to send me a pet. They sent me an elephant. He was too big!
> I sent him back.
> So they sent me a giraffe. He was too tall!
> I sent him back.

The children used this as the model for their own story of a visit to a farm, drawing on the same pattern and structures, but substituting different animals and adjectives.
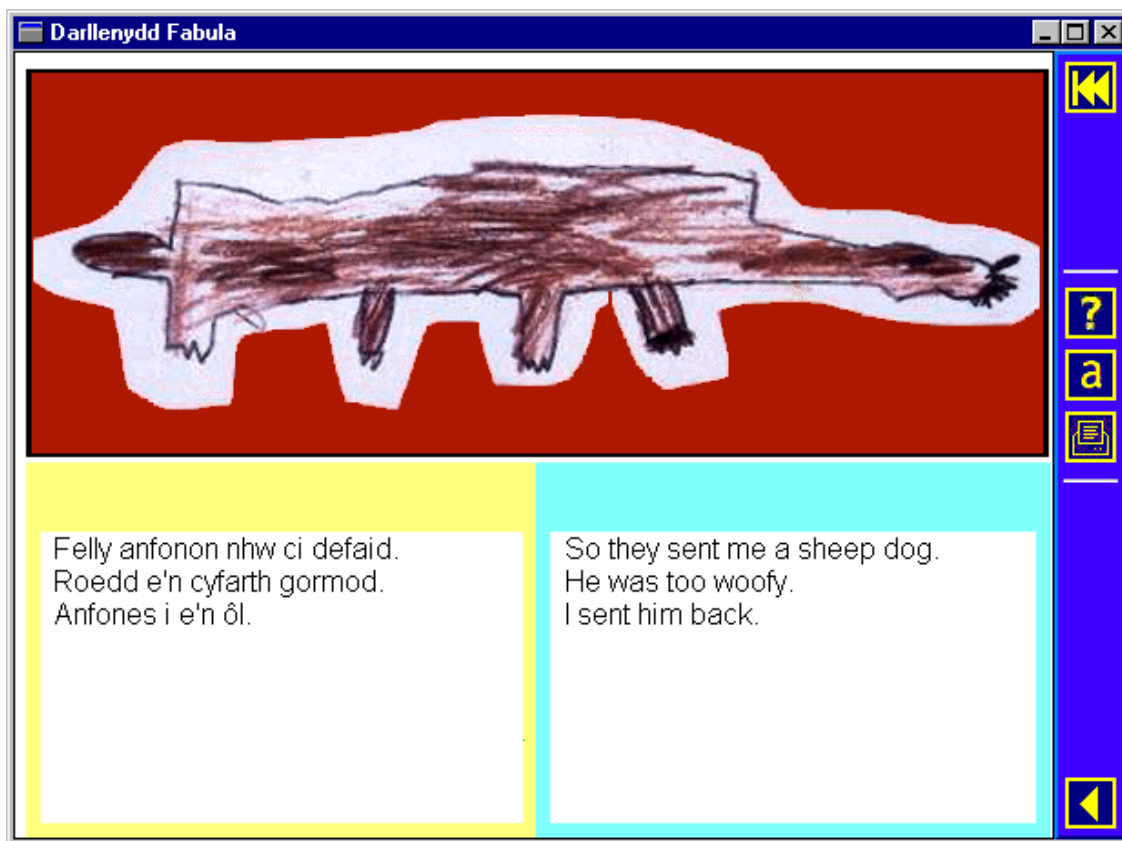

Figure 4. *Annwyl Fferm / Dear Farm*

The highly predictable language patterns not only allowed the children to learn the Welsh constructions very quickly but also to make suggestions for new words in Welsh. For instance, when translating "So they sent me a duck. He was too quacky," they invented the word *gwaciog,* based partly of the sound of the duck and partly on the -iog ending often associated with adjectives in Welsh. Although *gwaciog* is no more a conventional Welsh word than *quacky* is an English word, it was none the less totally comprehensible to a Welsh speaker and showed an impressive understanding of how the language works.

LESSONS LEARNED

One of the things that have become apparent in the evaluation of the Fabula software is the very wide range of ways in which this tool can be used in the classroom. Most possibilities involve collaboration between, on the one hand, children, teachers, and parents who speak the minority language and, on the other hand, children, teachers, and parents keen to acquire it. Such collaboration also offers opportunities to write for real audiences for a real reason, a feature that has frequently been identified as a fundamental in the successful development of writing skills (Hall & Robinson, 1994).

Although the three classes approached the making of their Fabula stories in very different ways, a number of common threads can be identified both in the stories already considered and from the experiences of other teachers and children who took part in the evaluation of the software.

The opportunity to compare two languages allows even very young children to develop their metalinguistic awareness: the fact that word order differs from one language to another; that different languages are sometimes written in different directions; that equivalent words in different languages often bear no physical relationship to each other. Speculation of this kind can lead to greater understanding of the target language.

The comparison of texts can also lead to language awareness of a rather higher order. Children are encouraged to think about the nature of translation: Are they aiming for word-for-word meaning or trying to communicate the sense of the first text in composing the second? Second language learners are also challenged by the need for parallel authoring, a process in which the children's level of competence in the second language determines the nature of the first language text.

The creation of bilingual digital books encourages the development of skills that benefit writing both in the first and second languages. The advantages of book making have already been well-documented for "paper" books (Johnson, 1994). Children develop a range of social and organisational skills that help consolidate their progress as writers. The organisational and planning aspects of electronic stories are even more complex. As a result, they offer children many opportunities for collaboration and the development of project management skills as well, of course, as for deepening their understanding of Information and Communication Technology (ICT). Indeed, children who author their own multimedia stories will be developing relatively high levels of ICT skills, as they make decisions about multimedia design. In this way they become not just consumers of software but also creators.

The bilingual focus of the Fabula software offers valuable opportunities for language learning. These can take the form of discussion of the spontaneous comments offered by children as they read and create texts in two languages. They can also be more didactic in approach as, for instance, in the case of group writing, where the teacher models particular vocabulary or constructions which children help to develop into their own distinctive story -- or through looking closely at similarities and differences between texts.

Status is another common thread, not previously mentioned, but running through the experiences of all the teachers who took part in the evaluation. The association of high status multimedia technologies with minority languages has far-reaching implications. Educators within these minority contexts are faced with various challenges in relation to both print and electronic resources. Because print runs for paper publications are small, the unit price is necessarily high and, as a result, the range and quality of material are far more limited than is the case for languages with larger numbers of speakers. Electronic resources are also subject to market forces. Whereas "major" languages like English, Spanish, and French feature prominently in commercial applications, minority languages, such as Friesian, Basque, and Welsh, are poorly served.

It is therefore not surprising that the few electronic resources that do exist in minority languages are greeted with enthusiasm. Chana, edwards, and Walker (1998), for instance, describe how attendance at a Urdu club in a multilingual primary school increased from 6 to 22 (including six monolingual English

speakers) when an Urdu word-processing programme was introduced. The high status associated with the new technologies seems to have been transferred to the minority language. The reactions of children taking part in the Fabula project were very similar. Many commented spontaneously -- and with enthusiasm -- on the fact that the interface was in the minority language; many also expressed approval for the fact that the sound functions allowed them to practice the minority language independently of the teacher.

FURTHER DEVELOPMENT

Current efforts on Fabula (now that the first version of the software has been developed, launch events have taken place, and trained users are in place) are concentrated on the development of the Web site. During the initial phase, this served mainly as a download site for the software and documentation. However, the ambition for the site is that it should be a focus for ongoing development and use of the software, with two major areas. The first is a "Virtual Fabula Community." Here teachers, parents and eventually children, will be able to communicate via e-mail, bulletin boards, and conferencing software. They will be able to hold discussions about their use of the software, as well as presumably provide descriptions of their schools, their classes, their language situations, and so on. Using Fabula as common ground, we hope that this will create a community of teachers and parents interested in discussing new approaches to teaching and learning minority languages. This has already begun within the regions where the project partners are located, but there is clearly potential for increasing the circle of participants to other regions and languages of Europe.

The second major area of the Web site is the Fabula "Virtual Library." Here, those who have used the software to create bilingual stories will be encouraged to deposit their work so that other teachers and children can download it to read it or reuse it in their own classrooms. Versions of "A Lovely Bunch of Coconuts" in five language pairs are already available and other titles are in preparation. The stories will be indexed so that both teachers and children can pick suitable titles and in turn add to the collection themselves. We see this creation of a collection of electronic resources in minority languages as potentially a major benefit of the project. The prospect of having their work published for the rest of Europe to see has proven highly motivating, especially for the older children in the partner schools, and they are keen to see this aspect of the project progress, to make contact with other schools, to hear what they thought of their stories, and so on. This enthusiasm reflects the attitudes of the teachers who have given their own time to be involved in the project. What has become very clear over the course of the project is that Fabula is much more than a software package. While the software is a useful tool, it also forms the focus for a community of users with a commitment to high quality and innovative language teaching, keen to look outwards to share their experiences.

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