CALL Courseware Development: a Handbook

Edited by

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Contents

The European Association for Computer Assisted Language Learning (EUROCALL)

Policy Document

1. Information and Communication Technologies and multimedia applications should be integral parts of all modern language curricula. They provide teachers and learners with authentic materials and cultural information and help to promote intercultural awareness and mutual understanding. They should serve as learning tools and classroom resources rather than instructional devices. EUROCALL will strive towards ensuring that their exploitation is embedded in a principled and harmonious approach to language teaching, taking the interests and the learning styles of students as their point of departure.

2. Since Information and Communication Technologies facilitate international contacts amongst teachers and learners, EUROCALL will support activities which focus on concepts of their exploitation and examples of good practice in order to provide an educational framework so that teachers and learners can fully benefit from the educational potential of telematics.

3. The use of Information and Communication Technologies for distance learning, both at national and international levels, should be promoted in order to make educational provision more flexible and accessible to a wide range of users. It is EUROCALL's intention to engage in activities which will further this aspect of CALL & TELL.

4. The key to the introduction and acceptance of Information and Communication Technologies lies in teacher training. Information about and training in appropriate uses of modern technologies as well as handling of the necessary technical equipment is essential. EUROCALL will provide an information network so that access to technical support and information on how to integrate such media into their daily classroom practice becomes available to all teachers of modern languages. Furthermore, in addition to the conferences, EUROCALL will support members in their efforts to run practical workshops and initial and in-service teacher training programmes, and distribute examples of good practice via the EUROCALL database.

5. EUROCALL will continue its efforts to examine possibilities for and foster continued co-operation between colleagues involved in the development of Information and Communication Technologies and their pedagogical application amongst its members. It will also encourage the formation and strengthening of special interest groups within EUROCALL devoted to promoting CALL & TELL in foreign language learning.

6. EUROCALL will give continued support to and co-operate with existing networks and organisations world-wide in the area of language learning and media exploitation.

EUROCALL Executive Committee
April 1997

Foreword

The EUROCALL Directory

This project, funded for the calendar year 1997 by the European Commission, DG XXII – Education, Training and Youth, established a database of ongoing projects which involve the development of language learning courseware employing computer-based technologies.

The aim is to provide language teachers in higher education with up-to-date information on current software development activities, funded from European Union and other sources. By utilising the expertise available within EUROCALL, the project also endeavours to identify good practice and attempt to minimise the duplication of effort which currently exists in this field.

Software developers were invited to submit information about their project,in a specific format. The EUROCALL Directory is searchable under a variety of relevant fields (e.g. country, target languages, technological and pedagogical focus, etc.). Information extracted from the database can be supplied to teachers, potential developers and researchers electronically or in printed form,and it is hoped that the Directory will eventually become searchable online.

Building on Expertise

By pooling the valuable experience demonstrated through the database entries, we hoped to present researchers with different methods and approaches to project development and courseware design. The original

aim of the project was to do this by means of a seminar, but it was gradually felt that it would prove more useful to make the expertise of colleagues available not only to a small set of specialists but also to the wider community of teachers, researchers, project developers,language centre managers and others through a published document.

We therefore decided to ask all the colleagues who had submitted entries to the Directory a number of key questions – questions that simply cannot be avoided when one is involved in CALL courseware development, whether this involves developing a few units with an authoring package or embarking on a major project.

The 25 or so questions reflected practical considerations but also encouraged participants to ponder over their own approaches and methodologies. It was felt that the wording of the questions should remain fairly neutral in order to avoid any preconceptions as to the type of response expected.

The Purpose of this Handbook

The selected answers were the ones which seemed most representative of today's CALL scene and the content of which was likely to be relevant in different learning environments. It is hoped that the multi-faceted answers which have been gathered in this handbook will provide an accurate view of current expertise in the field.Our intention was to reflect the diversity of possible approaches rather than try to impose a set of rigid guidelines. By doing so we also wanted to let the reader assess what methodology seems to be best suited to his/her own needs and pedagogical objectives.

Aspects that had already been dealt with in publications such as *Style Guidelines for Developers*(G. Davies, P. Hickman, S. Hewer: The TELL Consortium) and *Program Design Principles* (D. Laurillard: The TELL Consortium) have not been addressed here, and readers are invited to refer to these and other publications for more information (about design principles,interface design,interactivity and screen layout, for instance). The introductions to each chapter, written by members of the EUROCALL Academic Panel, aim to synthesize the various contributions and also to pinpoint aspects which may very well have been overlooked. It is hoped that readers will be able to make their own judgement, reflect upon the different methodologies described, integrate what solutions best meet their own needs, suggest new ones and collaborate in any future discussions generated by the distribution of the Handbook.

The Question-and-Answer format of the Handbook is deliberately unconventional, aiming to focus on specific issues rather than on the courseware itself, and to provide a handy source of reference for language teachers and others who may be considering the preparation of computer-based materials. Academics and commercial developers have very generously shared their experiences, both positive and negative,and we are most grateful to everyone who has taken the time to contribute.

Future plans

All the contributors are members of EUROCALL, and it is hoped that any debate resulting from this publication will be spearheaded by members of the association. Provided adequate funding can be secured, it is intended that ongoing debate will take place through a EUROCALL Web forum which would be especially set up for this purpose. Members would be able to post and retrieve library files, to access a help database and to take part in on-line conferences from time to time. Alternatively, a developers' discussion list could be set up. Any suggestions from members will therefore be very welcome.

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Design Methodologies

Philippe Delcloque

In this introduction,I propose to review, highlight and synthesise some of the comments made by the authors below and include a reflection on long-standing and emerging design issues and tendencies.

The response to the needs analysis question demonstrates the degree of informality in procedures in most of the projects surveyed. It also shows that many publishers have not begun to address some of the more established requirements (*Nesis* comments on EAP materials).

Among the highlights are the comments of the *DIDASCALIA* team, especially their definition and calculation of 'added value' and their warning against flawed surveys which by formulating dubious hypotheses or asking 'premature questions' fail to reach valid conclusions. Much social science research is criticised for such endeavours and it is incumbent on any needs analyser to ensure that their questionnaire-based approach can draw reliable conclusions.A useful summary is provided by *Decoo and Colpaert*: "For us, the main point in needs analysis is to detect problems and dysfunctions in the language learning process and to analyse how CALL can offer solutions".

Although the question referring to needs analysis was presumably meant to deal with users' needs, it may be relevant to look at the emerging wish of authoring tutors for a hybrid tool which could combine some of the advantages of toolbox systems usually not designed for language learning and paradigmatic systems (template-based) some of which are dedicated to language learning.

The didactic approach proposed by most authors emphasises their pedagogic agenda, a reassuring statement in a field which, in my view, has been almost entirely driven by technology (albeit sub-consciously) since its inception over 30 years ago.

The communicative approach plays an important role but few ask the question of the theoretical correspondence between this functional, performance-based, intelligently

interactive method and the supporting media. The relationship with authenticity or 'didactauthenticity' is of crucial importance too. The Web's potential for interactivity is described by *Nesi* who points to the effective use of computer-mediated communication and supervision and the individualisation of learning in a medium more usually associated with a more passive approach.

Familiar themes such as the dichotomy between linearity (encouraging directed learning and didacticity) and hypermedia movement (encouraging a student-centred resource-based learning approach) are presented. *DIDASCALIA* reminds us of many users' preferences for the didactic approach, which is often perceived to be easier by the less resourceful surface learner. Soria emphasizes the use of visual elements for comprehension, reminding us that language learning is a multisensory activity.

But can we realistically agree that approaches are of the "sophisticated tutorial type" or that a team can devote 95% of its time and budget to pedagogy and content and only 5% to programming? (*DIDASCALIA*)

Indeed, is it possible to distinguish so easily between content and media? There is a rumour that Marshall Mc Luhan's famous quote "The media is the message" was in fact "The media is a massage". The theme of the last CALICO conference was "Content, content, content!" A number of presenters attempted to analyse the relationship between content and supporting media. Most came to the conclusion that CALL is still driven largely by technological and interface constraints. It is indeed Computer Mediated Communication, within both the authoring and delivery domains, and 'design neutrality' is so difficult to achieve that most authors can guess whether a particular design is DOS, Windows or Mac driven and which authoring tool has been used in its production.

The whole panoply of options is described here from, at one extreme, the totally open, time-consuming and programmer dependent C (++), Pascal or Borland compiler to, at the other extreme, the template-based tools dedicated to language learning such as Speaker, Wincalis, etc. The intermediate stages include the use of Authorware, Director, and the more popular Toolbook or Visual Basic as well as Delphi (itself closer to the programming approach). Naturally both intuitive Web and HTML programming are beginning to feature, as well as the use of a presentation tool (Powerpoint). What is clear is that approaches have mirrored the progression of computing from the mediated to the intuitive, from letter-based to visual coding.

Given that few people have "both linguistic, programming and didactic experience" (*Didascalia*), the importance of teamwork cannot be over-emphasised as *Gimeno* reminds us.

So what of the relationship between the authoring system and the teaching/learning approach? We find descriptions of a type of data-driven learning with a reasonably transparent and clear structure which could be used by a variety of learners in different settings. Can that happen without giving authoring control to the recipient end-tutor-user, an approach espoused in the CALLIFaT project and typified by its theoretical offshoot, the DISSEMINATE concept or the application of the ring-binder philosophy to software and courseware development? The process of mediation may well happen at at least four levels: the instrument or machine, the operating system, the authoring facilitation and the medium of delivery.

To conclude with screen design and related ergonomic matters, we could say that progress has been facilitated by the harmonisation of the interface, platform conver-

gence, and the simultaneous appearance of the template-based tools and the WWW, although interestingly the Web is described as a less than uniform medium already (*Nesi*'s reference to the differences between Netscape and Internet Explorer).

There is a good deal of agreement among writers about the constraining effect of the interface and/or the tools used, about the need to give the user at least a degree of freedom including the ability to escape and to communicate, but there is surprisingly little discussion of the crucial relationship in my view between various forms of network technology (including the Internet) and interface or machine intelligence as represented in the shape of the design. Similarly, the ability to design evaluation and tracking procedures does not figure despite its advantage in providing a degree of 'mechanisation' of the learner feedback process as well as useful tools for analysis (but see *Jager* Q2.3,Q3.3 and Q3.5).

Q1.1   How did you carry out your needs analysis?

⌘   Our Web site – http://www.warwick.ac.uk/EAP – provides a programme of supplementary self-access materials for non-native speakers who are studying or are about to study at tertiary level in the medium of English. The EAP (English for Academic Purposes) needs of such students have frequently been investigated; and the findings of needs analyses have been well-documented in books and articles by EAP professionals. Our needs analysis drew on these prior accounts, but also on our first-hand experience of classroom-based pre-sessional and in-sessional EAP programmes in British universities, discussion with university tutors in a variety of disciplines to establish departmental requirements for English language and study skills at tertiary level (in Britain and overseas), and our experience of developing and evaluating an earlier package of EAP activities on the internal network at Warwick University (first made available in 1992). Besides confirming the need for reading, writing, note-taking and editing skills, our analysis identified a growing need for IT-related study skills. This need was expressed by many overseas students, but is almost completely neglected by current published EAP textbooks and is often ignored by EAP course designers and tutors.

   (*Nesi*)

⌘   Cette recherche-action de thèse ayant eu lieu dans le cadre d'une convention industrielle de formation (CIFRE) avec une sociétè, une analyse marketing et par segment de marché à permis de mettre à jour les besoins en matière d'enseignement des langues et les attentes concernant le support vidéo.

   Il respecte ainsi la volonté de choix de l'utilisateur qui n'est plus tenu de procéder à une lecture linéaire des films mais peut comme dans la vie réelle changer de sujet, y revenir, décider de la suite du visionnement...et cela en tenant compte de son niveau de départ en langues (débutant, intermédiaire, avancé).

Les aspects pratiques de conceptions, de configuration et d'usage du matériel ont été dictés par la nécessité et la discussion/validation avec les auteurs des deux méthodes préexistantes qui ont servie pour l'expérimentation (News Busters et Video Presentation).
(*Pasquier*)

⌘   When starting the specification of a new CALL-application, DIDASCALIA first defines the product profile and the target user group on the basis of a detailed analysis of a large number of actors and factors that may have an impact on the eventual added value of the application. This potential added value is calculated as an overall score on all criteria rather than as an enumeration of salient features.

As far as the target user group is concerned, needs analysis is one of the factors, but so is the analysis of user problems and expectations. Needs analysis that is only based on a simple query is likely to render biased information. When in the mid-eighties we asked language learners and teachers questions about the role of the personal computer in the language learning process, we did not get any relevant answers (although our products are being used now by thousands of learners). At present we see the same phenomenon with Internet or with broadband cable communication: future users cannot properly define their needs in a medium they do not know the potential of (DIDASCALIA is currently evaluating the added value of new broadband services for language learning in Flanders).

For us, the main point in needs analysis is to detect problems and dysfunctions in the language learning process and to analyse how CALL can offer solutions. Typical DIDASCALIA research consists in elaborating working hypotheses, in developing real world applications, in implementing them at home or in the classroom and in distance learning situations, and in evaluating their effectiveness. The reaction of the users guides us most in formulating new working hypotheses.
(*Decoo & Colpaert*)

⌘   Teaching experience of several tutors (Business German) in HE.
(*Whittle*)

⌘   By means of questionnaires filled in by our ERASMUS students.
(*Gimeno*)

⌘   In terms of specific exercises, a student reference group gave feedback throughout the development process. This was particularly useful because it led to items being included that the development team had not thought of. In general terms, research revealed that resources for advanced students of German were lacking.
(*Felix*)

⌘   Needs analysis was carried out by questionnaire which was given in

advance to non-native speakers working in the health service, as preparation for a recorded interview
(*Holden*)

⌘ Since this was our first major CALL development project involving several languages, interviews with members of staff and heads of departments were set up to define the area where CALL would be most useful. Grammar turned out to be a suitable subject, since students performed poorly and had few metalinguistic skills, which were deemed necessary for academic language departments.
(*Jager*)

⌘ Informally on the basis of previous knowledge of authoring tools used in the production of language learning courseware world-wide and more specifically as a function of the CALLIFaT team of authors' reactions to the selected authoring software namely *Speaker* and *Wincalis*. This established the need for a hybrid tool which could combine some of the advantages of Toolbox systems (not designed for LL) and Paradigmatic systems (dedicated to LL).
(*Delcloque*)

Q1.2 Which didactic approach did you select and why?

⌘ Most sections of the course follow a traditional textbook approach in that students are first given a brief introduction to an EAP skills area (for example, the making of summary notes, the use of a learner's dictionary, or the editing of written work), and are then presented with an example, task, and model answers. Within each section, however, the materials make extensive use of the interactive potential of the WWW. An e-mail link is provided at the bottom of most pages, so that users can contact EAP tutors at Warwick, or send comments and suggestions to a 'Guestbook' section, if they wish. There are also hypertext links to commentary boxes, pictures, other sections of the course and outside sites. Users can select their own learning pathways; and currently we are developing new pages to help learners choose and use activities appropriate to their individual needs.
(*Nesi*)

⌘ L'approche communicationnelle s'est donc imposée d'elle même. Pour la servir au mieux de la technique et des habitudes de consommation, nous avons développé un serveur de vidéo numérique plein écran à 24 images secondes (norme MPG1) et multi-utilisateurs (canaux indépendants). Le numérique à permit d'introduire une certaine interactivité dans le visionnement des contenus.
(*Pasquier*)

⌘   Reality (objects,ideas, processes) may be represented in various formats: linguistic, visual etc. I chose to approach comprehension through images rather than words. The aim is to make ideas, arguments and processes transparent using whichever tools are needed. The approach to meaning is through visual representation simultaneous with a verbal one. The visual representation,mostly language-independent would help both comprehension and recall. Recall (and comprehension) are facilitated further by making materials accessible. An IT-based multimedia approach seemed the solution.

(*Soria*)

⌘   DIDASCALIA's applications rarely incorporate a specific didactic approach on the surface. The principle of 'external versatility' allows applications to adapt themselves to different external didactic approaches,e.g. self paced learning in the '*à la carte*' environment, the specific lesson approach in the '*plat du jour*' environment or the textbook's approach in the 'interactive textbook'. This is made possible through the use of databases and various menus incorporated with the program,allowing contents and strategies to be selected at will.

Generally speaking, however, the vast majority of the users themselves give preference to a didactic approach that matches perfectly what is happening in the classroom. We found that CALL gets its first justification from the users, meaning that they select the most useful didactic approach for their needs. In most cases, this approach is of the (sophisticated) tutorial-type.

One important aspect of the approach concerns the place of content. Normally, a DIDASCALIA-program contains enough material for several years of language study (this in contrast to programs that are meant as a demo of a possible approach). Our team spends 95% of its research and development on content, and only 5% on programming.

(*Decoo & Colpaert*)

⌘   My program does not depend on and does not force the user (teacher or learner) to adopt any specific didactic strategy. However, I believe it is important that courseware should encourage students to work as much as possible on their own,and that it should stimulate teachers to individualisation and differentiation of learning process depending on the different learning capacities of the students.

(*Niwinski*)

⌘   Pedagogically driven approach where learning contents and the linguistic progression are joined – avoiding the danger of just providing a database.

(*Whittle*)

⌘   The communicative approach because it best suited the type of activities to be developed in the courseware.

(*Gimeno*)

⌘ A complement to the present *ab initio* taught course was required. The course is compressed and very intensive, with a large class taught simultaneously in four groups by four tutors. The course moves very rapidly through the structures of the language, and in class there is very little time for all the students to receive adequate practice.

The best feature of the *Speaker* multimedia authoring program is its sound capabilities. It was this that was developed, using other functions (text, pictures, video) to support oral drills, substitutions, transformations, comprehensions, dictations, reported speech, etc.

(*Bentley*)

⌘ The approach largely reflected a communicative, task-based orientation. Emphasis was laid on placing all exercises in the context of the play so that students dealt with realistic, meaningful materials that were familiar to them. It was also important to find ways of getting away from point and click exercises. As a result students are confronted with a variety of responses ranging from simple fill-ins to whole sentence answers.

An effort was also made to provide a range of activities which allowed students to switch between serious language work and lighthearted games, albeit all related to the play studied. The overall goal was to combine the teaching of language, literature and culture in a subtle, yet effective way.

(*Felix*)

⌘ The didactic approach is in a sense trying not to teach but to present language in context and encourage discovery and consciousness-raising.

The discourse had been generated in previously recorded video scenarios and was a pre-determined materials element for the linguist to employ. It clearly provides authentic language of a type that is different from 'fly-on the wall' recordings which are problematic from a data protection angle. The language is also very different from scripted dialogues designed to represent 'authentic' communication. The emerging discourse patterns drove the process of content and syllabus design which became *post hoc* in relation to the product, without being unprincipled. A close study of the texts made abundantly clear that developing sophisticated appropriacy in the use of the ordinary language that the practitioner knows was the challenging pedagogic task. The nurse routinely manages many and various levels of interaction in the performance of his/her duties, often with severe time constraints and with interaction contexts being sometimes modified by pain or surgical procedures. The institutionalised nature of the discourse supersedes often the usual contextual factors such as gender, status and age and yet prescriptive structure/function relationships cannot be taught. Pragmatic effects are often below the sentence level and even below word level; the pattern of the discourse is what characterises the language as Language for Special Purposes and the didactic approach is to present this for guided analysis whilst avoiding using any metalanguage, as the target group are not practised language learners.

(*Holden*)

⌘   A cognitive approach aimed at raising linguistic awareness with traditional text-based exercise formats. It best fitted the way grammar was taught in the departments concerned.
(*Jager*)

Q1.3   Which authoring system or programming language did you select and why?

⌘   All the texts were coded using HTML (Hypertext Mark-up Language). The editor used for this purpose was WebEdit Pro (version 2.0.3, Luckman Interactive 1996), chosen for the following reasons:

•   It was relatively inexpensive; no programming experience was needed; course developers could work on their own without technical support, and thus had full control over design decisions.
•   It has an easy-to-use Windows interface. The course developers were already familiar with Word for Windows, and quickly learnt the three-stage coding process (highlight what needs to be coded, consult menu, select appropriate code).
•   It permits manual changes to the code. This means that anyone involved in materials development can make small changes to the materials as required.

Other software used to develop the materials included off-the-shelf copyright-free Java Scripts, used to provide immediate feedback for true or false exercises and 'mouse over' answers. Some interactive forms were also achieved with Perl Script which was already available via Warwick University Computing Services.
(*Nesi*)

⌘   After trying Toolbook, I chose PowerPoint 7 (Windows 95) – now W97. Familiarity with MS Office applications and their functions (Word, Excel) meant a flatter learning curve. Reasons for this choice are:

•   Perfect compatibility with and transferability within Office suite; all sorts of tools readily available, e.g. graph handling; some integral features (e.g. semitransparency, transitions and animation) were extremely valuable, especially for representing processes.
•   Linear approach to presenting/obtaining information (although loops, branching and hot hyper links are possible) gave me better control of subject matter (URLs and bibliography are provided separately).
•   The application offers a variety of screen designs, but you are not limited to them. Each slide can have its own individual design. The resulting materials can have a dual function: OHPs for lectures and multimedia program for open access.

- Possibility of handing out hard copies in various formats.
- The application falls within the experience of most students.
   (*Soria*)

⌘ DIDASCALIA has never worked with authoring systems, because of their inherent limitations. Over the years we worked with the various programming languages that led the changing market. At the present time (1998) our preference is for Visual Basic 5. It allows for team work in an interdisciplinary way. Linguists are able very easily to build their own routines, didactic specialists can design scenarios, strategies and interactions, while the more technical people can add forms, controls and modules for merely operational purposes. Visual Basic allows an object-oriented content structuring and exploitation with advantages of multi-carrier output (hard copy textbook, CD-ROM or Internet applications).

  The problem with Visual Basic is that on one level or another conceptual problems will remain unsolved (some people then switch to Visual C++, which is rather labour intensive). However, if the project manager has both linguistic, programming and didactic experience, then most of the problems can be solved.
   (*Decoo & Colpaert*)

⌘ Delphi 2.0 Developer/Pascal. I have always found Pascal a perfect programming language because of its legibility. Its logic and its abundance of data types make it easy for me to shape and structure my ideas. I started programming for a living in 1988, and from the very beginning I was a PC-bound programmer. Borland compilers were a natural choice for me, they were popular, they worked fast, and I could afford them. And making my DOS programs work under Windows 95 would not be easy without Delphi.
   (*Niwinski*)

⌘ Toolbook (latest version): When we started to write our material for the computer this authoring program seemed to allow us to do more than others.
   (*Whittle*)

⌘ Asymetrix Toolbook because we wanted an IBM compatible programming tool which allowed multimedia development.
   (*Gimeno*)

⌘ Director was chosen because at the time (1995) it provided the best possibilities for the use of video and graphics.
   (*Felix*)

⌘ Asymetrix Toolbook II Publisher. We already had a copy of this package and the software developer is proficient in its use.
   (*Riley*)

⌘   Toolbook because it seemed most suitable for text-oriented work and hypertext and we could hire an experienced Toolbook programmer.
(*Jager*)

Q1.4   How did your use of this authoring system or programming language reflect your didactic approach?

⌘   This website – http://www.warwick.ac.uk/EAP – is designed for self-access use and its success depends very much on the motivation of its users and the quality of the information it provides. WebEdit Pro enables the easy and speedy creation of hypertext links on the WWW. Such links discourage passive viewing and motivate users by providing them with the opportunity to interact and obtain feedback.

Instant feedback on some activities is made available at the click of a button, or by running the cursor over a hotspot on the screen. This degree of interactivity would be possible in other formats, such as CD-ROM, but the WWW also provides opportunities for direct interaction between users and course developers. Users can receive individualised feedback by posting open-ended answers directly to us for evaluation. Moreover, we can gain insight into users' attitudes to the materials through e-mail messages and comments submitted to the 'Guestbook' section. The site is continually being adapted, expanded and updated, and many changes have been made in response to users' messages to us. Such development would have been technically and financially unfeasible if the materials had been published on paper or on CD ROM.
(*Nesi*)

⌘   It underpins it by allowing picture and audio-sequences to be called up alongside working with texts; also allows for intricate manipulation of navigation.
(*Whittle*)

⌘   The joint effort of programmers, graphics designers and linguists made it possible to overcome any programming constraints. It did not affect our didactic approach therefore.
(*Gimeno*)

⌘   It is a very useful complement to my very structured and intensive approach. It provides students constant necessary practice in their own time and at their own pace, thus reinforcing new structures explained in class and learned at home, with immediate feed back. Preliminary evaluation shows that it builds up confidence and accuracy through practice and repeated accessible explanations.
(*Bentley*)

⌘   It allowed very well for manipulation of video and graphics – unfortunately it did not perform as well in relation to students' text input.
    (*Felix*)

⌘   The structure of the application was decided in the software specification without reference to the development tool to be used.
    (*Riley*)

⌘   One criterion was that teachers should be enabled to bring their own linguistic expertise, experience and didactic insight into the program. This is reflected in the design which entailed creating a special shell in Toolbook (with exercise templates, feedback and hypertext facilities). This way the teacher/authors did not have to use Toolbook directly.
    (*Jager*)

Q1.5   How did you handle issues such as screen design, navigation, author/learner ergonomy, etc. in relation to your learning objectives and methodology?

⌘   Because we depend on the WWW for course delivery we are subject to a number of constraints. The site was developed with the needs of Warwick University students in mind, and we knew that these users would browse the WWW with Netscape Navigator versions. It was necessary however, to ensure that the materials did not radically differ in format when remote users viewed them using Internet Explorer. These constraints helped to determine our choice of page layout and fonts.
    We are still experimenting with texts of different lengths for our reading skills materials. Specially-written texts for computer-based courseware tend to be short; learners usually move from section to section by clicking on buttons rather than by scrolling. Some users of our website have criticised the fact that our reading texts often extend for longer than one screen, but despite the example of best practice in published courseware, we believe that our site should contain some longer texts for the sake of authenticity. Many Internet articles are several pages long, and students may need to read extensively on-screen as part of their university studies.
    (*Nesi*)

⌘   Navigation, being mostly linear, is simple. Optional branching (e.g. to sound/video files) are *cul-de-sacs*, therefore there are no options after them but to go back.
    There are three basic screen designs: one for use as OHP in class; a second one, to handle text (straight prose); a third one, for schematic representations. Each 'slide' has its own design, dictated by the content, yet it is

possible to use design features which are specific to a subtopic or para-graph. Clarity, colour, shape, animation, etc. are all very important. Humour and relaxation has a place in the overall design. I do not shy away from 'naf' and 'corny' images if they are likely to raise a smile. Such 'light-hearted' slides or components are interspersed at more or less regular intervals to break the tediousness of independent work (or the lecture).
(*Soria*)

⌘   Screen design, navigation and ergonomy are conceived as standard Windows. This sober look may disappoint 'whistles-and-bells' adepts, but it has the advantage that the program is able to reflect the expectation pat-terns of most users (standard menu interaction, help functions, courseware navigation functions and didactic interaction and feedback).
(*Decoo & Colpaert*)

⌘   I trusted my intuition, and common sense.
(*Niwinski*)

⌘   The screen design was done by somebody with a lot of experience in this field.
(*Whittle*)

⌘   By fully putting team work into practice. The linguists work together with the graphics designers and both in turn work with the programmers.
(*Gimeno*)

⌘   Most of these were already determined by the authoring program. We developed flexibility whereby the first time a unit is accessed the students follow a linear progression of varied exercises which can then be accessed at will the second or third time the student accesses the lesson. Since the units are determined by the grammatical structures covered in class the various exercises were put together so as to vary the pace of the unit. Students at a higher level of competence wishing to access the courseware to consolidate existing knowledge can consult an index and go to a specific unit.
(*Bentley*)

⌘   It was important to have an uncluttered and pleasing screen design and simple navigation system. For that I would always recommend a profes-sional designer, provided they do not 'take over' the overall design.
Re student control, an interesting change was made through the inter-vention of the student reference group: while the project team envisaged the resource to be chiefly a self-testing resource with quite a lot of restrictions put on students' pathways through the system, the reference group insisted on total student control. In retrospect that was indeed a wise decision.
(*Felix*)

⌘ The interface was designed using standard interface design guidelines regarding the use of colour, positioning of screen elements,etc. The navigation method is linear and was determined by the application pedagogy.
(*Riley*)

⌘ These were carefully laid out, following the set literature. The hypertext was made dependent on the exercises rather than the other way round to prevent students getting lost, and extra navigation devices were added such as linear browsing, history screens and a hierarchical ordering to facilitate moving about in the hypertext. Different screen layouts and font sizes were tried out during pilot tests involving 60+ students. The program flow was set up in such a way that students could always decide how much information they wanted or at which point they wanted to quit a particular set of exercises.
(*Jager*)

⌘ The only relevant comment here is our belief that no authoring tool dedicated to language learning could possibly ever be just linear (like Wincalis) as one must be able to program Hypermedia movement/freedom.
(*Delcloque*)

2

Evaluating and Testing

Bernd Rüschoff

One of the most important aspects when discussing technology enhanced resources for (language) learning is the question of how to evaluate and test the functionality and effectiveness of such materials. At conferences and workshops dealing with Computer Assisted or Technology Enhanced Language Learning (CALL & TELL) an increasing number of potential users are asking for research in this area. Consequently, the survey at hand collected information on this topic, and section two of the questionnaire addressed this issue. Software developers were asked to comment on their methods of evaluation and testing. Aspects to be covered dealt with the evaluation itself, but developers were to discuss how the results of their efforts affected both the use and future versions of the software. The questions asked dealt with the general framework of formal evaluation, the criteria on which evaluation and testing was based, procedures used, and changes in content and functionality resulting from preliminary findings. A final question dealt with the problem of comparative evaluation, i.e. measuring the value of courseware as compared with other software or other media.

As far as summarising the answers to the various questions as quoted in the following chapter, it becomes apparent that different project teams addressed different aspects of evaluation and testing. In summary, it is felt that the following issues need to be considered when looking at and evaluating courseware:

- functional aspects and content appropriateness need to be established;
- linguistic aspects, both in terms of effective presentation of content and in terms of fruitful learner-software interaction must be investigated;
- learner and tutor satisfaction are further important issues of any significant evaluation;
- the effectiveness of tutorial strategies and navigational procedures integrated into the

courseware must be considered;
- levels of progress and results achieved by learning with a given item of courseware are to be examined but difficult to measure;
- guidelines for the most effective learning scenarios in view of different types of course-ware need to be part of evaluation and testing, i.e. whether courseware is best used in a classroom setting, for self-study, or as part of a telecooperative learning scenario.

As the various answers to the questions in the questionnaire document indicate, each project group or courseware developer and evaluator had a different focus when developing or testing courseware. Consequently, the evaluation procedures also varied both in method and aspects considered.

The first distinction can be made between function-oriented tests and those which conducted a more formative evaluation, looking at effectiveness of use with various groups of learners. This reflects one of the major problems in this area, i.e. objectivity vs. subjectivity. Empirical research and evaluation require the use of both quantitative and qualitative procedures. Obviously, it is easier to collect quantitative data, e.g. by using student tracking devices integrated into the software in order to observe learning strategies, help options or courseware branches utilised or ignored, and tasks solved. But such data still needs to be interpreted objectively in order to arrive at valuable conclusions on some of the aspects listed above. An evaluation of whether courseware works or is flawed with bugs using quantitative methods is easily conducted, as such aspects can be measured objectively. However, when it comes to effectiveness of tutorial strategies and navigational procedures in courseware, qualitative elements need to be considered which sometimes are difficult to measure. The same applies to comparative studies when trying to prove better or more effective learning with any given courseware rather than with other materials and media or in form of regular classroom interaction.

Both quantitative and qualitative evaluation require different methodologies, which again is reflected in the answers quoted below. Here, *DIDASCALIA*, for example, focus heavily on a functional evaluation dealing with debugging and establishing correctness and adequacy of content. They conducted evaluation and testing of courseware in such a way that as many users as possible had to work with the software at several stages of the development or consider various check lists. As far as an objective analysis of effectiveness is concerned, they point out the need for developing more measurement instruments and models.

Other project groups or evaluators used questionnaires in order to collect data on some of the issues raised above. A typical method, trying to measure qualitative aspects as objectively as possible on the basis of quantitative data collected, is the use of preference scales , as mentioned by *Jager*. In this project's study, learners were asked to assign marks on the same scale they are used to (1–10) for certain questions on the questionnaire. Marks were given for attractiveness, suitability for self-study, the degree to which it improved their insight into grammar, etc. Some of these questions were presented contrastively, i.e. they also gave marks for these aspects in the traditional setting (class-room based teaching). As mentioned above, a further option pointed at by some is the use of student tracking devices, which register each click of the mouse or input typed into the program. At first glance, such methods appear to be very suitable for the collection of objectively measurable data. However, the interpretation of data collected is as difficult

as in the case of analysing questionnaires or students' comments.

Interestingly, none of the courseware developers or project teams specifically mention verbal reporting or think-aloud amongst the methods and procedures used in their evaluation, even though some of the answers to the questionnaire suggest that learners were asked to comment on their impression of the courseware. As far as measuring progress of learning and results achieved, again one of the more difficult aspects to evaluate, some of the information gathered hints at the use of pre-, while- and post-testing.

What is encouraging, though, is the fact that a large number of courseware developers and project teams are considering the issue of evaluation and testing right from the start. Quite a number of courseware developers point out the need to continuously incorporate results of evaluation and testing in further stages of development. *Riley*, for example, mentions a process of iterative development, whereby feedback from testers is incorporated into successive beta versions of the software. Also, an increasing number of courseware users and researchers are conducting qualitative and quantitative investigations in the area of CALL & TELL, looking at most of the aspects listed above.

Q2.1   Who conducted the evaluation? (sample groups? where? own institution? elsewhere? how many people? students ? teachers? both? reliability?)

⌘   At DIDASCALIA testing, debugging and evaluation happens in several stages:

• Pre-testing: specification checking. Prototyping is considered as specification testing. This pre-testing is performed by the programmer. It allows us to judge feasibility and to foresee conflicts between linguistic, didactic and technical specifications or requirements.
• Testing 1: routine checking. At each step in the program development, the programmer has to double-check every routine himself. Leaving too much testing to the debugging phase can lead to a considerable waste of time.
• Testing 2: content implementation testing. Content developers have to check at each step of content development whether the program is still functioning correctly (what happens with speed, database size, range check errors?).
• Testing 3: operational testing. This operational testing (often called debugging) is done by paid external users, often students. These users try to guess and create the conditions under which the program will crash.
• Testing 4: content testing. Native speakers are involved to make corrections and suggestions. This testing can be done on paper or in the program itself.
• Testing 5: beta-testing. This is the first time the program is tested by

real users in a real environment. These users have the program at their disposal for testing purposes. Results of this testing phase lead to a new finalised version of the program.

• Testing 6: real world testing. After finishing the product and after launching it on the market, the program is tested in the real world by people who buy the product (learners and teachers) and express their opinion by fax, email or phone. Results of this testing phase are implemented in a new working hypothesis that can lead to a new program.

• Testing 7: research evaluation. Fortunately, quite a few people are eager to evaluate courseware made by others as part of their research. These evaluations help us to reflect on our own decisions, options and choices.

(*Decoo & Colpaert*)

⌘   Evaluation was undertaken at our own institution with our ERASMUS students. The evaluation was conducted by a linguist although software features were also contemplated in the questionnaires.

(*Gimeno*)

⌘   Last year formative evaluation was conducted with a group of 20 students, with the program integrated into the course timetable. This year the program is being independently evaluated with the whole class (64 students). Again the program is integrated into the course timetable and students are further encouraged to use it in self-access mode. It is also being evaluated at different levels in two other institutions independent from our own.

(*Bentley*)

⌘   The evaluation was carried out by an independent researcher (MA student in the Dept of Linguistics). Subjects consisted of three groups of advanced students of German at two university campuses (9 students and 8 teachers of German). Two groups were located at my own institution, the other at an interstate institution. While this was not set up as an experimental study, the variety of data collection (Pre-post tests, Questionnaires, Observations and Journals), and the independent status of the researcher, suggests a fairly high level reliability. More evaluations in different settings are still being carried out.

(*Felix*)

⌘   The evaluation was conducted at the Faculty of Arts, University of Groningen (our institution) in three different departments, with four languages. It involved over 64 students, whose completed questionnaires were fed into SPSS for processing. The evaluation was repeated later. Judging from the reception of the program later, the evaluation was very reliable: no unexpected issues turned up and students' reactions remained more or less the same.

(*Jager*)

Q2.2   What criteria did you apply? (technical ones only? learner/teacher satisfaction? learning process?) And how did you define and measure these criteria?

⌘   One criterion for evaluating the website is its popularity with users. We consider the number of reported hits to the site and its component pages as a basic but useful measure of its popularity. At present we have no means of knowing the pathways users take through the materials, or the extent to which the same users return to the site. Clearly the site would be of greater pedagogical value if users accessed materials in a systematic way, rather than simply browsing briefly. (In future, usage may provide some further information regarding individual patterns of use.)

Learner and tutor satisfaction, as expressed through e-mailed comments and questionnaire responses, is a further measure of the site's success. In particular we seek evidence that users are finding the materials relevant to their needs as tertiary level students in English-medium institutions.

(*Nesi*)

⌘   The criteria DIDASCALIA applies in its own testing and evaluation phases (cf. Q2.1) are linguistic, didactic and technical. Effectiveness and user satisfaction are measured only at the level of spontaneous user reactions by fax, phone or email. An objective and accurate analysis of effectiveness cannot be conducted by the developer himself. Hence the need for more measurement instruments and models.

(*Decoo & Colpaert*)

⌘   The following criteria were applied:

- adequate language content
- adequate learning skills
- satisfactory organisation of content
- user friendly interface
- intuitive navigation
- technical problems
  (*Gimeno*)

⌘   The evaluation study was designed to find out:

- the students' level of interest in working with a multimedia package.
- what aspects of the package students found most effective and/or enjoyable.
- how effective the program was in teaching difficult aspects of German.
- whether the students found the teaching of grammar in the context of literature useful.

- whether the program is best used in a classroom setting or as a stand-alone resource.

Students were also asked to comment on technical aspects. Instruments used are described in Q.2.1 above.
(*Felix*)

⌘   All the criteria mentioned in the question were applied. Given the subjective element we decided to have students assign marks on the same scale they are used to (1–10). Marks were given for attractiveness, suitability for self-study, the degree to which it improved their insight into grammar, etc. Some of these questions were presented contrastively, i.e. they also gave marks for these aspects in the traditional setting (class-room based teaching).
(*Jager*)

⌘   For the present evaluation we are using questionnaires to collect data on both the contents and technical aspects of the courseware. Pre and post test questions on the grammatical structures being practised are also being asked with each questionnaire. Informal information is also being gathered through interviews and conversations with students. At the end of the course we will also measure attendance and feedback from the students with their overall performance.
(*Bentley*)

Q2.3   What procedures did you set up to check that the courseware you had developed did correspond to its objectives?

⌘   The questions asked in the evaluation study (fully reported in *On-CALL* Vol.11, No. 1,1997) corresponded directly to the objectives of the program.
(*Felix*)

⌘   A detailed Functional Specification of the software was developed through dialogue between the software developer, the project co-ordinator, and project partners.
(*Riley*)

⌘   Continuous assessment of results on the basis of the student tracking routines in the program, questionnaires, etc. for three years.
(*Jager*)

Q2.4 What changes in your courseware were recommended as a result of the evaluation and testing procedures? (design, ergonomy? navigation facilities? major or minor changes?)

⌘ Our preliminary evaluation involving students and tutors at Warwick University has revealed two areas for concern: users seem to be avoiding the challenge of more demanding texts and tasks (we have received very few written answers to open-ended questions, for example) and tutors do not appreciate the site as a resource to supplement their teaching (few tutors access the site themselves, or refer their students to it). These findings suggest that new ways should be found to motivate users, and encourage them to make effective use of the materials.
   (*Nesi*)

⌘ This is an important aspect of DIDASCALIA's history in terms of 'user-driven development' over more than a decade. Our first program, *Verbapuces* (1986), was meant as a 'tool' for the discovery and training of French verb conjugations for some 1300 verbs in 22 tenses, generating more than a million conjugated verb forms, all on a single 5 inch diskette for computers with 56K RAM memory. A similar program on French vocabulary, *Vocapuces* (1987), contained 6000 words in context. Through a detailed menu system, the user was able to freely select contents and strategies tailored to his/her needs in the '*à la carte*' environment. But then teachers asked us for a more 'tutorial' environment where they could prepare in advance tailor-made lessons for individual students or for groups of students. This environment became the '*plat du jour*' environment. Next, users asked us for print and save capabilities, for integrated sound and for more exercises on grammar. Contrary to our expectations, however, users also asked for simplified versions of these programs linked to the textbooks they were using. These special adaptations, *Verbapuces-Eventail* and *Vocapuces-Eventail*, published in 1989, had much more impact than the more general versions. As the *Eventail* textbooks were – and still are – being used in more than 80% of elementary and secondary schools in Flanders, we wanted to analyse this drive towards 'curricular CALL' in detail.
   This brought us to a new working hypothesis and to a new series of developments based on the Lisa platform [see Colpaert J. (1996), 'From working hypotheses to development: the LISA platform', *Computer Assisted Language Learning* 9 (4), 385–394]. After analysing needs and expectations of learners, students and teachers, we developed the concept of the interactive textbook. *Eventail Interactif* on CD-ROM was launched in 1996, followed by *Eventail* – and *Junior Interactif* in the fall of 1997. Each of these programs offers more than 1300 exercises (for a total of more than 22,000 interactive items) on spelling, vocabulary, grammar, listening comprehension and culture, each for two year sequences of learning French. Each

Interactif program includes a complete manual, grammar and dictionary. Along with print and save capabilities, the program also offers a listing of the exercises done by the student (for parents and teachers) and generates a series of remedial exercises based on error analysis.

This evolution taught us the value of 'user-driven development', at least in our context, where foreign language learning is a prime educational concern. It is not how designers and academics view the value of CALL that points the way, but the reactions and needs of thousands of users.

(*Decoo & Colpaert*)

⌘   As a result of the formative evaluation, units were shortened, more help and explanations were introduced; the visual support (pictures) was increased.

(*Bentley*)

⌘   Very minor changes related to navigation and input of answers were made. I expect a lot more changes would have been suggested without the use of the initial reference group.

(*Felix*)

⌘   The design was altered slightly after student feedback; feedback from teachers, who were involved throughout the design stages, caused a great many changes, some quite substantial.

(*Jager*)

Q2.5   How did you (or do you plan to) integrate the results of the evaluation into the final version? (difficulties encountered? solutions?)

⌘   Busy EAP tutors with little personal experience of the Internet still prefer to refer their students to hard-copy materials, and generally tend to under-estimate the role of IT in tertiary level study. Although we would like to change tutors' attitudes to the WWW, we do not think that this can be achieved by altering our materials, so we intend to be patient, whilst continuing to publicise our product to the profession.

We do intend, however, to make changes to the courseware to help users choose and use activities appropriate to their needs. We plan additional pages of diagnostic tests and self-assessment tasks, with emphasis on the selection of learning goals and learning pathways. Users' comments have already led us to make changes to our reading skills section. A number of users complained that the texts were too long to read on screen, and we have responded by adding more short-text activities, whilst retaining some of the longer texts to provide practice in extensive on-screen reading.

(*Nesi*)

⌘ If the specification of an application is formulated as a working hypothesis based on previous experiences, and if this specification has been tested on linguistic, didactic and technical criteria during prototyping, then very few changes are to be recommended until finishing the product. The main recommendations for change are given by the users once the product is being used (testing phases 6–7 cf. Q2.1). These recommendations lead to new working hypotheses that will be implemented in new applications.
(*Decoo & Colpaert*)

⌘ The biggest difficulty is always to find yet more money and time to address suggested changes. There is no solution to this other than including even more pre-production student feedback.
(*Felix*)

⌘ Through a process of iterative development, whereby feedback from testers is incorporated into successive beta versions of the software until the first release version is arrived at.
(*Riley*)

⌘ Since we were in a unique position with four teachers (0.4 fte),a co-ordinator (0.2 fte) and a full-time programmer involved for three years, changes could be made very quickly. This was one of the strengths of the project, but also one of the critical factors on the time scale since it caused the program to be changing all the time.
(*Jager*)

Q2.6 How did you measure the value of your courseware as compared with other software and the use of other media?

⌘ Difficult – partially through reviews and personal contacts with people engaged in a similar field.
(*Whittle*)

⌘ Results are not yet available as the evaluation is now being analysed, but students were asked to compare and rate this particular courseware with the other CALL programs and other resources at their disposal.
(*Bentley*)

⌘ By asking a large number of other students and colleagues to give feedback on the resource.
(*Felix*)

⌘   Mainly by demonstrating it as widely as possible and judging from people's reactions. We soon realised that the program raised a lot of interest in other academic language departments.
(*Jager*)

3

Implementation and Integration

Joseph Rézeau

This chapter seeks to elicit from the authors of ongoing projects their views on the implementation of their software and the way it integrates with the learner and the curriculum.

The first question which the participants had to address was that of the learning environment, a concept which encompasses the material concept of 'accessibility' of the software and the more theoretical concept of the type of pedagogy envisaged for its actual use.

All answers to this question give detailed descriptions of the particular environments targeted for the software, and it is quite clear from those descriptions how the potential users will be able to access the lessons. *Nesi*'s strong point in this respect is obviously its accessibility to foreign students 'prior to [their] departure to an English-medium institution', whilst *Bentley* rightly points out the advantage of flexibility of use of the software for those students who have missed their regular, scheduled classes.

Unsurprisingly, the self-access mode of use is mentioned by all six respondents to question 3.1. Indeed,in the past few years,self-access and self-instruction have tended to become synonymous with educational software and multimedia. However, it should be emphasised that self-access does not necessarily imply that the students will be alone with the materials. Quite significantly, *Gimeno*'s description goes as far as to spell out what could be regarded as the *sine qua non* elements of a self-access language learning environment: the inclusion of such learning resources as a bilingual dictionary, etc. and 'a student assessment utility which gives feedback on every activity'.

Question 3.2 asked the participants in the survey to position their courseware in relation to the curriculum. There is an immediately striking opposition between the *Decoo* answer on the one hand and the rest of the answers on the other. For *Decoo*, there is not the slightest doubt that what the end-users want first and foremost is 'courseware which perfectly matches the curriculum', and this is what *DIDASCALIA* is out to offer.

On the contrary, the other respondents are keen to point out that their software is aimed at complementing, reinforcing, to various degrees, another type of instructional mode and is not complete in itself. This particular section indeed presents a problem, since it is almost impossible to compare arguments belonging to the genre of marketing, with its typical accumulation of figures, quantifiers (no less than twelve of those in the *Decoo* paragraph) and wide-sweeping statements on the one hand, with arguments pertaining to the genre of academic practice and research on the other! This is not the place for embarking on a long, sterile quarrel between those two worlds, but I would still like to question the validity of such a statement as "These interactive textbooks thus contain the entire curriculum content, so *students can study what they have learned at school…*" (my italics).

The EUROCALL questionnaire suggested that the respondents classify the potential uses of their software according to the well-known 'tutor' vs. 'tool' paradigm. The tutor-tool framework is discussed at length in Levy (1997: chapter 7). Interestingly, the two words are not much used in the answers, and when used seem to cover different concepts. Again, *Decoo* stands out from the rest in stating quite clearly that although 'tools' types or uses of software are more creative than 'tutorial' uses, the public massively wants the latter type.

Gimeno states that her courseware "is designed as a complementary tool for students who may or may not have access to a tutor", thus seemingly reserving the 'tutor' role to a real teacher, and that of 'tool' for the software.

On the contrary, *Hewer* insists on the role of her software as a tutor, both at authoring level and at student level. It is my feeling that, the more open and authorable a piece of software is, the better that piece of software can play the role of a tutor. Indeed, to quote Hubbard:

> …any piece of courseware […] carries with it a "teacher in the machine", a projection of the personalities of the designers, programmers, materials developers […]. It is this collective persona that a teacher brings into his/her class as a teaching partner when the students use CALL packages. (Pennington, 1996: 21)

Question 3.3 required the respondents to describe the type of learner control promoted by their software, and was answered by four people only. All four respondents stated that their software allows the learner a large degree of control over selection of activities. They also insisted that this large degree of control meant the students could decide on the time and place of activity, within certain material limits.

The *Hologram* program (*Jager*) stands out, since it belongs to the 'adaptive' type of software, and automatically adapts the range of exercises to the level of the student. Although technically quite feasible, it seems that adaptive software of this kind is fairly thin on the ground, probably because it has to be based on a fairly large corpus of data, carefully selected and tagged, in order to be usable adaptively.

Holden evokes a serious problem in educational software for languages when mentioning that lack of constraining control in the software could very well mean that it could be approached by a learner "without doing any language tasks at all"! And the conclusion of *Holden*'s paragraph is that "the learner may well need a good deal of guidance…"

Guidance is a key-word in any activity which seeks to promote autonomy and self-instruction. The problem of how to guide the students into making the most of self-

access material, be it computer-based or otherwise, has often been evoked in the litera-
ture:

> I would suggest that students are often loath to make full use of the help facilities
> offered, and need to be directed in ways ranging from gentle prodding to forceful
> recommendation. (Burgess, 1991: 12)

The adaptability of *Hologram* would seem to be one answer to this problem, if it can be
ascertained that the software does indeed react 'intelligently' to the learner's input and
progress. But we certainly need more research and development into the necessary study
of learner guidance, if we are to avoid the pitfalls of 'tourism' on the one hand and
'brutish' machine-control on the other…

Only three respondents provided answers to Question 3.4 on the topics of interactiv-
ity/interaction. While *Holden* and *Nesi* describe ways in which actual or further develop-
ment of their software would provide the students with facilities for e-mail discussion
with their teachers or peers, *Hewer* describes at length the various interactive facilities
incorporated in the software interface. The learning environment described by Hewer
seems quite promising and conducive to a high degree of learner-machine interactivity
such as might be expected of educational software but is, unfortunately, all too often
absent or reduced to a mere caricature of interactivity.

Finally, the question on the ***respective roles of the teacher and the learner*** brought its
share of questions as well as answers. A first observation, which comes as no surprise to any
teacher active in the field of CALL and TELL, was that, at the various institutions of the par-
ticipants, a majority of teachers seem to be either reluctant or in need of support, whereas
the students seem generally more willing to integrate multimedia than their teachers.

Whittle points out that technical support for the teachers seems to be indispensable
in the first phase. In that initial phase, teachers are more preoccupied with the technical
side of CALL. It is only when they have mastered the technical aspect that teachers can
concentrate on their role as facilitators with the students.

Jager and *Hewer* insist that successful integration of the courseware can best be
achieved if the teacher plays the role of content provider, by using the software's author-
ing facility where it exists. However, this participation of the teacher in the authoring
process does not preclude production and distribution of ready-made materials. *Hewer*
insists that, in that case, support documentation will have a vital role to play towards
integrating the materials into the work of the class of end-users.

Conclusion

The answers to the questions in this section of the questionnaire provide a rich, varied
corpus of the beliefs and expertise of those engaged in the production of language-
teaching software. Although the various roles of the software are viewed from diverging
angles, there seems to be wide-ranging agreement as to the importance of guidance and
appropriate feedback in all self-access activities involving a computer. There is also
agreement that the most promising scenario for successful use of the software is that of
the teacher-author who authors a set of materials directly related to the work of his/her
own students. This point of view, to which I strongly adhere myself, poses however the

problem of the validity of software packages which are produced with a more commercial aim in mind, not for one's own students but for the general public.

There is probably room for both types of software. Let us say that in the best of worlds, we could wish to see on the one hand the best professional quality in the design of software authored by teachers for their own classes and, on the other hand, the best pedagogic expertise in more commercially-oriented software.

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Q3.1   For which learning environment is your software best suited and why? (examples of learning environments: self-access environment, classroom, distance learning, etc.)

⌘   The website http://www.warwick.ac.uk/EAP provides a programme of self-access materials for non-native speakers who are studying or are about to study at tertiary level in the medium of English. Users may access the materials prior to departure to an English-medium institution, during a taught pre-sessional EAP programme, or whilst studying in their subject department.
        (*Nesi*)

⌘   The school-bound, 'curricular' courseware aims at increasing the added value of the teacher by increasing the learning efficiency of the learner. The newly developed interactive textbooks allow the student to save time and build confidence while studying. They can be used at home or at school in a self-access environment. See also Q1.2. and Q3.2.
        (*Decoo & Colpaert*)

⌘   Our courseware is best suited to a self-access language learning environment because the software includes learning resources such as a bilingual sound-enhanced dictionary, grammar reference book, book on Spanish culture, book on functions of language, recording studio, and most important, a student assessment utility which gives feedback on every activity.
        (*Gimeno*)

⌘   The courseware is integrated into the timetable of an *ab initio* course in blocks of one hour. Ideally I would integrate it into every class for 20 minute periods. It is also being used in self-access mode by students who

require further practice or who have missed scheduled classes through ill-
ness or other reasons. It has also been used on a self-access basis by other
students on more advanced courses, again to consolidate their knowledge.
(*Bentley*)

⌘   The target group for which this program is designed is a dispersed group for
whom learning vocational language may be part of their continuing educa-
tion or for whom it may be a tool to aid mobility in employment. In many
cases the learner will be alone with the materials. However, the wealth of cul-
tural material available visually, by description of the health structures in one
of the countries where the target language is spoken, and in the language
tasks, indicate that it may well be used in nurse training establishments.
(*Holden*)

⌘   The student component of the package was designed to be used specifi-
cally in self-access mode. It was designed in response to student requests
for software to help them to develop reading sub-skills (predicting, skim-
ming, scanning and reading for detail) and to gain access to the meaning of
a text before having to discuss it with a native speaker tutor. It was
designed initially for the non-specialist linguist.
(*Hewer*)

Q3.2   How would you position your courseware in relation to the curriculum? (Tutor or tool? Compulsory or optional use? Reinforcement, individualisation and differentiation of learning process? Individual or collaborative use?)

⌘   The website does not constitute a complete EAP programme; it concen-
trates on developing reading, writing and study skills rather than listening
and speaking, and there are many subskills that it fails to cover (for exam-
ple, it does not provide practice in extended project writing or the use of
library resources, nor does it teach users how to survive in an English-
speaking environment). It is envisaged that the majority of users will also
have the opportunity to attend conventional EAP classes, but will access
the website to reinforce and supplement what they have learnt in class.

At Warwick University the website functions as a substitute for a con-
ventional self-access centre. Most of the students who access it are not
known personally to the materials designers, and use of the materials is
entirely optional. The website activities are not a component of any credit-
bearing award.
(*Nesi*)

⌘   The principle of external versatility means that DIDASCALIA's standard

programs can be used both as a kind of tool (freedom to discover, combine, change...) in the '*à la carte*' environment and as tutorials (precise lessons defined) in the '*plat du jour*' environment. Although we developed and tried to promote more creative software (programs such as *Texta* and *Flexicon*), feedback from the users proved that the tutorial approach, which precisely matches the school situation, draws the largest response from the public.

In *DIDASCALIA's* experience, the massive response of thousands of users has shown that courseware which perfectly matches the curriculum is the most appreciated and the most widely purchased (99% of sales). Our 'user-driven development' thus led us to the concept of the 'interactive textbook', whereby the courseware offers in an interactive way as much as possible of the material from the normal textbook used in class.

Each of our interactive textbooks offers more than 1300 exercises (for a total of more than 22,000 interactive items per book) on spelling, vocabulary, grammar, listening comprehension and culture. Each software program contains the material for two-year sequences and includes a complete pedagogical grammar and a dictionary tied to the curriculum. Along with print and save capabilities, the program also keeps an updated list of exercises done by the student (for parents and teachers) and generates a series of remedial exercises based on error analysis.

These interactive textbooks thus contain the entire curriculum content, so students can study what they have learned at school and parents can follow their progression through a detailed description of their performance.
(*Decoo & Colpaert*)

⌘   Our courseware is designed as a complementary tool for students who may or may not have access to a tutor. It is for individual use although it can also be used in a collaborative way by two students at the same time. The interactive exercises allow this type of student collaboration.
(*Gimeno*)

⌘   Within the present course it is an essential and timetabled component. It is therefore compulsory and part of the learning process. But it serves equally well for self-access at different levels.
(*Bentley*)

⌘   The courseware is designed as language for special purposes and not to facilitate the comprehensive learning of the language. Individualisation and differentiation are key theoretical considerations. Learner personality is encouraged and feedback is quite open and non judgmental, which may be difficult for learners who need to be told if they are right are wrong.
(*Holden*)

⌘   The tutor component of the package is designed to enable tutor-authors to

provide students with texts appropriate to their needs in terms of theme, linguistic content and level. In this way individualisation can be achieved, as can progression. The software is designed to lead students through the processes of skimming, scanning, reading for detail and to provide them with an opportunity to demonstrate their understanding of the causal links within a text. However, it is not necessary to complete one activity before attempting the subsequent activity, so the student can choose to focus on one or other reading subskill, or simply test their understanding of the text by completing the summary if they wish to do so. This provides an element of differentiation. The function of the student component of the software is to act as tutor. Because of the openness of the authoring function and the fact that both linguistic knowledge and skills are dealt with, it is possible to use the software as reinforcement, but also as a means of encouraging students to prepare for a topic in advance of a face-to-face class by familiarising themselves with the vocabulary of the topic, the content of the text, and, if appropriate, with one or more reading sub-skills.
(*Hewer*)

Q3.3 Define the type of learner control promoted by this courseware (control over selection of activities and materials, time and place of learning, interaction with peers and teacher/ tutor, etc.)

⌘ The website is accessible from any computer with access to the WWW, and users are free to select their own learning pathways through the materials (although having chosen a section from the menu they normally follow the set sequence of introduction, example, task, and model answer).

As any interaction with tutors is asynchronous, users have control over the time as well as the place of learning.
(*Nesi*)

⌘ The courseware is fully learner-centred. The student has complete control over selection of activities and use of the complementary reference materials (sound-enhanced bilingual dictionary, grammar book, culture book, etc.). The courseware can be used on a stand-alone workstation or on a network.
(*Gimeno*)

⌘ The program is designed to give complete control to the learner, with the objectives for each unit stated at the beginning of the unit. Since the methodology may not be familiar to the learner, only subsequent evaluation will reveal whether this unfamiliarity and perhaps resistance, is an impediment to learning. Discrete items from the menu can be easily accessed and a grid at the beginning of the program gives comprehensive

information about settings, type of participants, functions, vocabulary, and other specific linguistic features. The user can create their own syllabus and could approach the material without doing any language tasks if their own agenda was to virtually visit and revisit quite sustained dialogues with supporting video material.

However, it is hoped that a self-evaluation instrument will be devised to encourage the user to self assess and to guide the user to build up a portfolio of language activities undertaken as part of a strategy of continuing language learning in professional and personal development. It is recognised that the learner may well need a good deal of guidance and use of the program is by no means unproblematic to implement.

(*Holden*)

⌘   *Hologram* automatically adapts the range of exercises to the level of the student by re-iterating over predefined sets of exercises and adding exercises for areas not mastered on each consecutive run. Students choose their own time and place of learning, but learning has to take place in the institution because of student monitoring.

(*Jager*)

Q3.4   Define the nature of the interactivity/ interaction promoted by the use of your courseware (learner-machine, learner-learner, learner-tutor, learner-wider community, etc.)

⌘   The student component of the courseware invites the learner to make some predictions about a text, having read the title. They might be required to predict some key words and to check them in the vocabulary. They might be required to note down two or three themes that they predict that the author will address and to check these out when they have finished their work on the text. In the skimming and scanning sections, students are invited to highlight sections of the text in response to questions posed by the tutor-author, and to compare their answers with those provided. This element of self-evaluation continues in the 'Reading for Detail' section where students have to type in answers to questions which require piecing together information from various parts of the text. This involves them in a degree of interaction with the responses provided by the tutor, and also with their own responses. Because of the flexibility of the medium, they can edit their input, should they wish to do so. All tutor questions, student and tutor responses can be saved automatically to a notepad which can be saved and/or printed out at the end of the session. This approach makes demands on the student's study skills. However, it also involves them in various aspects of information processing, and of interrogating their inter-

nal linguistic database which is at least as likely to lead to successful learn-
ing as receiving right/wrong feedback.
   (*Hewer*)

⌘   The limitations of the project funding mean that the learner is likely to be
   interacting only with the machine except perhaps where the program is
   available in training establishments. Further development proposals look
   towards establishing networks where the language learning as the program
   stands now would be a first stage with electronic collaboration encouraged.
   The four languages in the program would then be the medium for seeking
   and exchanging information in the professional domain in a themed elec-
   tronic discussion group with the learners having specific tasks set by their
   language tutors working towards a collaborative research outcome.
      (*Holden*)

⌘   Most feedback to exercises is automatic and instantaneous, but users are
   provided with the opportunity to e-mail to the course designers their
   answers to some more open-ended tasks. They can also mail their com-
   ments about specific materials, or about the site in general. Facilities for
   direct learner-learner interaction are not provided, although users can
   make some limited contact with other users by posting their comments to
   the website 'Guestbook'.
      Links from the 'Bulletin board' offer quick access to a selection of other
   websites providing train, travel and tourist information.
      (*Nesi*)

Q3.5   What should be the role of the teacher and of the learner in relation to the integration and use of your courseware in the curriculum? Does this always work in practice?

⌘   Because the materials are freely available on the WWW we have no control
   over the way that they are integrated into the curricula of other educa-
   tional institutions. At Warwick University, however, we intended the web-
   site to supplement our pre-sessional programme in English Language and
   Study Skills, and complement a full programme of taught EAP courses
   during the academic session. The majority of EAP students at Warwick are
   not personally known to the course designers, but we do know their EAP
   tutors, and we expected these tutors to welcome the website as a source of
   additional EAP materials, and to disseminate information about it.
      In practice we found that most tutors were reluctant to get involved.
   Whilst not unsympathetic to our project, they preferred to recommend
   materials in book form. We demonstrated the website and distributed

explanatory leaflets at staff induction meetings, but most tutors claimed that they were too busy to access the site themselves, and they did not appear to know precisely what it contained.

This result was disappointing, but in time tutors may become more accustomed to the role of IT in EAP. Meanwhile we are developing activities to help users take greater responsibility for their own learning.

(*Nesi*)

⌘   The teacher should be a facilitator and give individual guidance and support, also monitor progress and facilitate/assess role-playing. The learner can pace his/her progress.

Initially teachers had more technical support work to do and less of the above, but the technical difficulties are now ironed out and teachers can concentrate more on the role they envisaged for themselves.

(*Whittle*)

⌘   We find that teachers are not always as familiar with CALL materials as would be desired. We find that students are more willing to integrate multimedia CALL into the curriculum than teachers are.

(*Gimeno*)

⌘   One scenario for the successful use of the courseware is that of the tutor-author who creates a set of materials which relates directly to the work of the class. Activities in class should provide input before students use the software and/or provide an opportunity for student output based on the input provided by the software. If the materials are seen simply as a bolt-on, learning opportunities will be lost. Learning takes place as students make their own the input provided by the tutor, whether that input comes through face-to-face activity or through other media. As the courseware is still at the pilot stage, it is not yet possible to predict whether or not the materials will be used in what is seen by the developers as the optimum way. As it is intended to use the authoring component to produce and publish ready-made packs of materials for specific needs (e.g. English for Business and Management) it is likely that these packs will often be used as optional extras within a resource centre, although the support documentation will suggest ways of integrating them more closely into the work of the class.

(*Hewer*)

⌘   Integration is achieved mainly by the teacher's role as content provider. The teacher normally teaches the lecture/class that *Hologram* is part of and is also responsible for entering and updating program material. In addition, he/she has direct access to student progress, group results and exercise statistics returned by *Hologram*. Didactic methodology is put in the hands of teachers. This does not always work. Additional pedagogic-didactic expertise may be required.

(*Jager*)

4

Project Management

Graham Chesters

When the UK Universities were funded in 1993 to launch over 70 courseware development projects, it was abruptly said by one of the project directors that, to achieve success, what mattered was not the amount of money received, the brilliance of the developers, the experience and knowledge of the content providers but simply *project management*. Anybody reflecting back on the UK's Teaching and Learning Technology Programme might with some justice conclude that he was right. Several projects, in many disciplines, failed to live up to expectations; the volume of the courseware which actually reached the commercial market has been disappointing; the capacity of projects to keep to the agreed timescale was low. What applied to an extent to the TLTP projects can no doubt be applied with added certainty to many European software projects.

None of this is surprising. Academics are not always comfortable with managing or being managed. And who can say with total conviction what style of management will work? Will a combination of hard work, happiness and shared leadership produce results when the team is small (*Whittle*)? Or, even then, will it be necessary to set milestones, deadlines, weekly monitoring sessions and other mechanisms to encourage a constant awareness of progress (*Jager*)? Is there a widespread appreciation of the importance of asking these questions, of being conscious oneself of a chosen management approach? It might be significant that the response in the Questionnaire to Q4.3 on Intellectual Property Rights and copyright excites greater detail than the fewer and more laconic replies on management.

Yet project management resides at a higher level and is the more important since it includes the capacity to deal with IPR and copyright. Knowing everything there is to know about the latter two will be of little purpose if the project fails to produce its deliverables because of inadequate management.

Is it not time that all fund-providers seek to test the project management skills of the principal investigators before they hand out their funds – or indeed our funds?

Q4.1   What mechanisms did you establish for the management of your project?

⌘   A small group of people needs little management as long as everybody is working and happy. Where correspondence with a publisher was required, or where difficult decisions were concerned, one person took on the task – who this was changed according to what that person was best at.
     (*Whittle*)

⌘   Appointing project manager. Weekly meetings with the project team. Weekly progress reports. Setting milestones and deadlines.
     (*Jager*)

Q4.2   How did you manage internal decision-making, financial control and monitoring of progress within the project?

⌘   Decisions were made in the development team, with the project manager keeping an eye on objectives, finance, etc. Steering group consisting of senior staff and professors from the participating departments was established to monitor overall progress.
     (*Jager*)

Q4.3   How did you address issues such as Intellectual Property Rights and Third Party copyright?

⌘   (a)   Third party: 99% of the material used in the courseware is our own creation. We did need to borrow some pictures, many were copyright free, and every attempt was made to contact the owners of the others to seek their permission; most of them replied delighted that we were using their materials and no one denied us their integration into our courseware.
     (b)   The issue of my own Intellectual Property Rights has not been addressed, and at the moment I am happy that my creation is proving to be a pedagogical success where it is used.
     (*Bentley*)

⌘   All materials used have to be copyright free, or else in the public domain. Text-based materials, exercises, etc, are written exclusively in house or else where coursebook related are provided free of charge by the copyright holders, usually the authors. Video clips and photographs with certain

exceptions originate in-house and we own the copyright. We have a friendly no-cost arrangement with another company (MiniFlashcards) to use scanned in versions of a given set of their still pictures for demo purposes. One professional video clip we use is in the public domain.

    (*Williams*)

⌘   Copyright permission has been granted for all the authentic texts we are using to develop academic reading skills. We were refused copyright permission for some texts we had originally intended to use, and in most cases where permission has been granted we have had to pay the copyright holder a fee. Those who have contributed teaching materials have done so without copyright restriction.

First-time users of the website are invited to accept a licence agreement (prepared on advice from legal experts at Warwick University) before they access the materials. Amongst other things, the agreement requires users to accept that:

- The copyright in the courseware is held by CELTE subject to any moral rights of the individual authors of the courseware.
- The user undertakes to levy no charges or fees in respect of the courseware.
- The user undertakes to use the courseware solely for educational purposes. Use of the courseware for profit is specifically prohibited.
- The user agrees not to permit the courseware to be copied, and agrees to indemnify CELTE in relation to any claim or action arising in respect of any contravention.
- The user shall not modify the courseware in any way.

    (*Nesi*)

⌘   *DIDASCALIA* operates as an academic research centre within the university structure. Software developed at the university normally belongs to the university, which signs contracts with publishers for the distribution of programs meant for the general market. All royalties return to the centre, enabling us to pay the relevant researchers.

In the case of the interactive textbooks, in which material from existing textbooks is included, permission to use the content in the software is granted by the publishing house concerned, which in return receives the right to distribute the software. Authors of the original textbook receive no royalties on the software, as the software is viewed as a sustaining instrument for the reputation of the books.

In the case of specific projects for industry or the public sector, some software is developed with an explicit contractual agreement that the copyright is turned over to the commissioning party. This party can then distribute and commercialize without limits. The expertise, however, always belongs to the university and the individual expert.

    (*Decoo & Colpaert*)

5

Commercialisation of CALL Software

Graham Davies

1   Establishing a framework for commercialisation

It is a commonly held belief that "if you build a better mousetrap the world will beat a path to your door". It's a nice idea, but not always true. The dramatic fall in the market share of the Apple Mac computer, which was way ahead of its time when it was first launched in the 1980s, is clear evidence that a good quality product does not necessarily sell itself. As *Decoo & Colpaert* point out, a "realistic business plan" is essential, and *Gimeno*'s advice that "commercialisation has to be tackled at an early stage of the project" cannot be repeated often enough. I came to similar conclusions when I conducted a survey into EC-funded CALL software development projects in 1994 (Davies *et al.*,1994). It soon became clear in the course of this survey that very few developers had given serious thought to the commercialisation of their products, often having failed to identify a real need and a potential market. Many made their first approach to publishers only when their product was almost finished, only to find that no publisher was interested or that a publisher would take on the product half-heartedly with no promise of intensive marketing. The demise of the many good projects and products that our team examined in 1994 underlines the need for forward planning and the establishment of a sound partnership between educational institutions and publishers.

A commercial developer/publisher has to live from the profits of its products and is therefore much more likely to give advance consideration to their chances of success. As *Williams* points out, "we ... have always had a commercialisation framework". He also provides evidence that the "better mousetrap" phenomenon lives on: "the most successful promotion route is largely low-cost word-of-mouth". I can substantiate this claim, adding that it is important to sow the seeds of promotion very carefully, by supplying information and evaluation copies of new products to organisations and key centres that will pass the word on,e.g. national or regional information centres and teachers' centres.

In other words, you have to ensure that the world – at least your part of the world – knows that your product exists.I can also substantiate Williams' claim that "conventional advertising through the educational or computer press is virtually useless".

2   Quality control measures

This is an area in which educational institutions have little expertise. Home-grown software usually works successfully in the confines of the institution in which it is created, where the local hardware and software configurations are managed by support staff who can identify problems on the fly. But this does not mean that the software will work anywhere else. The replies to the question on quality control measures indicate that much work has to be done to inform educational institutions about this aspect of software commercialisation. Only *Williams* and *Decoo & Colpaert* appear to have understood what is involved, *Decoo & Colpaert* referring to the "20-80 rule" – a fair estimate in my opinion of the relative proportions of the time taken to develop a prototype and the time required for finalising the product for commercialisation. At an early stage in the development process, my own business uses the services of an experienced 'wrecker',a person who deliberately sets out to make the software crash. The 'wrecker' finds the worst bugs, which are corrected. We then issue around 20 beta-test versions of the software to a variety of educational institutions. Feedback from the institutions usually reveals most problems associated with unusual hardware or software configurations – which are considerable and often not anticipated by the developer. However, many problems continue to arise during the life of the software, which underlines the importance of ongoing technical support (see below).

3   Marketing and distribution

The replies to this question indicate that developers in educational institutions either have not considered this important aspect of commercialisation or, wisely, leave it to an experienced publisher. *Williams*' comment on having a "sales force that is intimately associated with the product" is worth noting. There are many publishers – usually book publishers – whose sales forces are inadequately trained in the demonstration of CALL software and who therefore do software developers few favours when they take on their products.Smaller, specialist firms are often more successful at marketing and distributing CALL software. Large publishing concerns are much more prone to allow market forces to dictate which products succeed or fail.

4   Technical and pedagogical support

Gimeno's comment is worth emphasising: "publishers tend not to commit themselves in providing any kind of support". This is a common phenomenon. If the publisher has not been "intimately associated with the product" (*Williams*) then it is unlikely that the publisher will be able to offer any kind of support. This throws the burden of support back on to the developer. The advice offered by *Williams* and *Decoo & Colpaert* is sound,and my own experience as a software developer and publisher indicates the need for perma-

nent ongoing technical support, preferably at the different levels suggested by *Decoo & Colpaert*, with only the most serious problems being referred to the programmers. It is clear from the answers to this question that insufficient consideration has been given to pedagogical support. My own business is bombarded with enquiries about the kind of student the software envisages, which Key Stages in the British National Curriculum it addresses, how it can be integrated with existing coursebooks, the availability of work-sheets and, importantly, what kind of advice and training is available for teachers – and parents – wishing to use it.

5   Conclusions

Partnerships between educational institutions as researchers/developers and busi-nesses as publishers/distributors can be successful, but it is important that the part-ners come together and agree on the way ahead in the initial stages of the development of a product. There are a few success stories where, for example, an educational institu-tion has developed a product for internal use and then offered it to a publisher who has turned the product into a best-seller, but these are the exception rather than the rule. Marketing and distribution are best left to the specialists and cannot be handled adequately by an educational institution. Technical support cannot be underestimated and may have to be handled by the developer for a number of years after the product is published.

Q5.1   At what stage in your project did you establish a framework for commercialisation, and how was this carried out?

⌘   We are a commercial company and have always had a commercialisation framework. The most successful promotion route is largely low-cost word-of-mouth. We give partial support to travelling educational consultants who demonstrate our products as part of their other activities. Conventional advertising through the educational or computer press is virtually useless. Having a demonstration and training centre easily acces-sible in London is invaluable. Dealers and bookshops are becoming increasingly important, and now our web page is bringing in tangible results.
        (*Williams*)

⌘   DIDASCALIA's first program *Verbapuces* (1986) was not really developed for commercial purposes. But as it was copied (legally or illegally) by thou-sands of users, a market was created and we were able to start a production line for new products. For a few years, the centre sold its products for the general public directly to interested parties, but as the market grew, con-tracted publishers took over the distribution.

All royalties return to the research centre, with a 10% overhead for the university. As the reputation of the centre has grown, contracts with publishers now usually include both a pre-investment by the publisher to start developing a new product, and a non-refundable advance on the royalties (to cover the risk of the centre). A standard investment by a publisher for a completely new program is between 50,000 and 100,000 US$. The royalties that return to the university are a standard 50% of the sales price, minus taxes and material production costs. These may seem very favourable conditions compared to what other CALL-producers get in return, but a realistic business plan requires this kind of investment and return in view of the high design and development costs.
(*Decoo & Colpaert)*

⌘   The project started as a commercial enterprise but was never fulfilled as such, though a Swedish company ComputerHouse supported it financially through the first three months. The first version of *LinguaLab – svenska* (the first in a number of the project's desired outcomes) has been available for sale (as shareware, on Internet) since May 1997.
(*Niwinski)*

⌘   Fairly early on in hindsight, i.e. when we had only worked on the outline of a concept on the computer; but it took years to find one and then several more to finish (we are still in the process of finishing although the product was published in November 1997).
(*Whittle*)

⌘   Experience in earlier projects taught me that commercialisation has to be tackled at an early stage of the project. Publishers have to be contacted and demonstrations of the software carried out. Spanish publishers are still very reticent about publishing CALL materials because the level of sales never reaches the levels of more traditional materials and therefore profit is lower.
(*Gimeno*)

⌘   In year 3. A publisher showed interest in the program and we started negotiating. Commercialisation was put on hold after the main interested parties agreed to form a consortium which is still in effect. The consortium was mainly put in place to enhance the program further and provide continuing support. Since once again third parties have shown an interest, we shall contact a publisher again offering him an improved product.
(*Jager*)

⌘   Until the product is stable enough, there is little point in envisaging commercialisation. However, at the outset, the end-product's first implementation was planned to be very inexpensive (99 US$).
(*Delcloque*)

Q5.2   What quality control measures were taken to ensure a commercial standard product?

⌘   We carry out our own quality control and debugging measures, but new products are invariably piloted in private language schools and universities in the UK and elsewhere. Much time is taken up with the product packaging and design of paper manuals.
(*Williams*)

⌘   For all of its products DIDASCALIA applies the 20–80 rule: 20 percent of time and energy for developing a first prototype, 80 percent of time and energy to make it market-ready (including finishing the database, testing and debugging, beta-testing, writing manuals,set-ups and hand-outs). Over the years the contracting publishers have taken over more and more the final finishing in terms of the actual material publication (artwork, cover, box...). We give them the software master and they take care of the rest.
(*Decoo & Colpaert*)

⌘   The producer (a Swedish company, ComputerHouse) was to be responsible for making the product according to a commercial standard but the question was never brought to the fore as the program has never become a real commercial product. Releasing *LinguaLab – svenska 1.0* in May 1997 as a shareware product was rather meant to be a kind of quality test, and not a step towards commercialisation.
(*Niwinski*)

⌘   Trials on different machines.
(*Whittle*)

⌘   None.
(*Gimeno*)

⌘   Software-engineering level debugging followed by alpha and beta testing followed by formal evaluation.
(*Delcloque*)

Q5.3   How did you address issues such as marketing, production and distribution on a commercial scale?

⌘   We are a mail order company with one person devoted exclusively to invoicing, bookkeeping and distribution. Two other members share the role of marketing with development so that the sales force is intimately associated with the product.
(*Williams*)

⌘   Though the program *LinguaLab – svenska 1.0* is available on Internet for downloading as a shareware, its production and distribution on a commercial scale is still just a wish, which makes marketing issues irrelevant for the time being.
(*Niwinski*)

⌘   The publisher did.
(*Whittle*)

⌘   I left this in the hands of the publisher.
(*Gimeno*)

⌘   We do not envisage handling this ourselves; we are looking for a commercial outlet especially with a view to these aspects.
(*Jager*)

⌘   In the longer term, various channels may be investigated (publisher, word-of-mouth, Internet or a combination).
(*Delcloque*)

Q5.4   What were the arrangements for user support, both technical and pedagogical?

⌘   Two or three people are permanently in the office to deal with customers' technical enquiries and also to demonstrate the products.
(*Williams*)

⌘   DIDASCALIA has the following arrangements:

•   Technical: telephone, email and fax customer service. The publisher's helpdesk is the first to handle standard questions (FAQ, problems with installation, compatibility, exchange of products, updating…). Only more serious problems (rare) are routed to the research centre.
•   Pedagogical: teacher's manual (free), Teacher's Bulletin (5000 copies per issue), occasional lectures to large groups of teachers in in-service training programmes. It should be noted, however, that most of our programs are now being used at home and that the perfect match with the curriculum requires little extra pedagogical support.
(*Decoo & Colpaert*)

⌘   Through the publishers; pedagogical support by giving e-mail addresses of G. Hogan-Brun and myself.
(*Whittle*)

⌘   In our case, the authors are responsible for both technical and pedagogical support via the Internet. We have a web page and e-mail address for this purpose. No support has been requested till this day though. Publishers tend not to commit themselves in providing any kind of support.
(*Gimeno*)

⌘   These were set up as part of the consortium agreement.
(*Jager*)

⌘   This was a crucially difficult issue to address. As this is envisaged as a World Wide Web-compatible authoring environment with a significantly diffuse ownership, a number of support models could be envisaged or it could be offered as shareware with no support.
(*Delcloque*)

Suggested Further Reading

In addition to the well-known academic journals covering CALL issues (including *ReCALL*)*, the following publications are suggested for further reading:

Barker A., Frier D., Graves P. & Suleiman Y. (1995), *Language Teaching And Learning In Higher Education: Issues And Perspectives*, London: CILT, ISBN 1-874016-46-1.

Barker P. (1993), *Exploring Hypermedia*, London: Kogan Page Limited, ISBN 0-7494-0946-0.

Bickerton D. (ed.) (1997), *Rapido Final Report,* Socrates & Youth Project TM-LD-1995-1-GB-58, Plymouth, UK.

Blin F. & Thompson J. (eds.) (1998), *Where Research And Practice Meet: Selected Papers from EUROCALL 97, ReCALL* 10 (1), Hull: CTICML in association with EUROCALL, ISSN 0958-3440

Davies G., Hickman P. & Hewer S. (1994), *Style Guidelines For Developers,* University of Hull: The TELL Consortium.

Gimeno A. (ed.) (1996), *Technology-Enhanced Language Learning: Focus on Integration: Proceedings EUROCALL 95,* Universidad Politécnica de Valencia, Servicion de Publicaciones, ISBN 84-7721-421-2.

Kohn J., Rüschoff B. & Wolff D. (eds) (1997), *New Horizons In CALL, Proceedings of EUROCALL 96,* Hungary: Berzsenyi Dániel College, Szombathely, ISBN 963-9017-26-4.

Korsvold A-K. & Rüschoff B. (1997), *New Technologies In Language Learning And Teaching,* Council of Europe Publishing, ISBN 92-871-3254-2.

Laurillard D. (1993), *Rethinking University Teaching: A Framework For The Effective Use Of Educational Technology,* Routledge, ISBN 0-415-09289-2.

Laurillard D. (1993), *Program Design Principles,* University of Hull: The TELL Consortium.

Levy M. (1997), *Computer Assisted Language Learning – Context and conceptualisation,* New York: OUP (Clarendon Paperbacks).

Nielsen J. (1995), *Multimedia and Hypertext: The Internet and Beyond,* Academic Press Inc., ISBN 0-12-518408-5.

Pennington Martha C. (1996) *The Power Of CALL,* Houston, CA: Athelstan. ISBN 0-940753-03-0.

Phillips R (1997), *The Developers Handbook To Interactive Multimedia,* London: Kogan Page, ISBN 0-7494-2121-5.

Riley F. (1995), *Understanding IT: Developing Multimedia Courseware,* ITTI publication, University of Hull, ISBN 1 85889 099 3.

Rüschoff B. & Wolff D. (eds.) (1995), *Technology-Enhanced Language Learning In Theory And Practice: Proceedings of EUROCALL 94,* Pädagogische Hochschule Karlsruhe, Germany: EUROCALL, ISBN 0-9520183-6-5

Thompson J. & Chesters G. (eds.) (1994), *Emancipation Through Learning Technology: Selected Papers from the EUROCALL 93 Conference,* Computers & Education 23 (1/2) Oxford: Pergamon, ISSN 0360-1315.

Yazdani M (ed.) (1993), *Multilingual Multimedia: Bridging The Language Barrier With Intelligent Systems,* City: Intellect Ltd, ISBN 1-871516-30-7.