The Introduction of Language Learning Software into the Curriculum under Non-Experimental Conditions

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Abstract

CALL (Computer Assisted Language Learning) was introduced in the BA (Hons) of European Studies Course in Baptist University to see whether it can raise the quality of language tuition. Three major aspects were defined in this action learning process.

The first is that a computer based component for intensive language training has been introduced on a large and systematic scale. The second is the attempt to create a comprehensive system of linkage between a well-defined teaching syllabus and an array of commercially available software titles. The third is the investigation carried out as the consequences of such software usage for the curriculum and students' attitudes towards the technology as part of the everyday learning process.

By aligning software elements with the curriculum, a system was devised which allowed students immediate access to relevant, meaningful exercise material, known as 'Study Path System'. Due to the pedagogical nature of the software, the larger the usable software collection grew, it was found out that the technology threatened to have a marked retrogressive effect on the curriculum, namely by counter-balancing the latter's 'communicative' principles.

Students acceptance of CALL was evaluated by semi-structured interviews following video-validated 'think-aloud' sessions with CALL. The latter were conducted with 12 students by the research assistant of the project as participant observer. In this case students were encouraged to self-reveal the thought process while attending to the CALL tasks, to self-observe their actions and to self report on what they thought was their common learning behavior with the computer. The overall acquisitional progress of the students was measured through a series of 14 proficiency tests throughout Year I and II of the course which has used CALL in learning.

The results showed that CALL was effective in the belief of the students, although it became foremost a tool for exam preparation and self assessment. Students also recognized the training character of the software and assume that successful CALL practice can only take place after the relevant explicit knowledge has been gained in other contexts. It is also believed by the student that language learning should be taken place in the classroom rather than by way of computer-based tutorial. CALL was seen as worthwhile because of these advantages: quantity of exercises offered, variety and ease of handling, flexible timing and 'face-saving' nature of exercising. The team stressed that CALL is used as a means to accelerate what students already doing in formal practice, but did not replace teacher-student interaction, nor did it in any way affect the desire to engage in real communicative action. In turn, CALL become part of the overall ecology of language learning.

Talking about the effectiveness of CALL, the team admitted that the findings reported can only serve as hypotheses to be tested further, in view of the small population of the research and the enormous range of possible causes for learning in a non-experimental field. A total of 14 tests results aimed at assessing all basic language skills delivered a fairly accurate and reliable picture of the overall progress of students

including active and oral skills. But there seemed to be no significance outcomes to indicate students learning was improved after the introduction of CALL. It was concluded that the intensity of CALL practice have given rise to profitable outcomes for weaker students of the first intake, but it did not essentially benefit the top students nor the weak students from the statistical findings.

In conclusion, the researchers found that CALL was useful when it can be suitably fitted into the curriculum. The introduction of CALL in itself did not change the quality of the language learning, but reinforced a perception of language learning as a process of accumulating explicit linguistic knowledge and of pattern automatisation. A top priority in the development of CALL must be an intricate 'interface' between topics and notions relevant in communicative action with formal practice offered by the computer.

Introduction

> Before I come to this University I never used computers to help me do some problems. But after I come to this College, then I have to — I am supposed to use computers. (TAPCalp9)
>
> I begin to work more exercises with the computers although I did not like it. [...] Because I know it is very important for me to learn how to work with computers. (TAPQueep9)
>
> I prefer computers [...] because I can learn many things from the computer. [...] I think mostly in our days computer work is much important. I can also learn grammar, language — I can also learn computers how to use it. (TAPFip37)

Enormous faith is placed in computer technology, and students take no exception. The assumption that computers can and should improve the quality of learning is a by-product of the technology's growing pervasiveness in everyday life. But is this indeed the case? More specifically, does CALL (computer-assisted language learning) actually raise the quality of language tuition, and under which conditions?

The above remarks were recorded during think-aloud sessions ('TAPs') with CALL programmes. CALL was introduced into the B.A. (Hons) of European Studies course at Baptist University in 1995 by way of the Action Learning Project (ALP) Computer-Based Support for Foreign Language Learning in the University (Hess, 1996). It has been, to our knowledge, the first comprehensive attempt to make CALL an integrated, systematic component of an undergraduate curriculum in Hong Kong. Following the common structure of action learning research (Kemmis and McTaggert, 1982), this paper outlines the initial plan to introduce CALL, ensuing action to implement a CALL infrastructure and a number of observations and reflections on the basis of nearly two years of experience with CALL under 'real-life' conditions. Ours was not an experimental, controlled study of singular aspects or the development of new software titles, but the large-scale attempt to use already available software in order to enhance language learning.

The results are clearly mixed. CALL has been readily accepted by students as part of their overall learning routines. It has led to an increase in the amount of learning time and the willingness to deal intellectually with the subject on hand - the foreign language. This is undoubtedly an effect of the popularity of the medium. CALL alone, however, has so far had no measurable effect on overall learning achievements. This is to some extent due to the dubious quality of the software which, despite the technical modernity of the medium, is a belated reflection of antiquated theoretical models of (language) acquisition. The antagonism between the acceptance of computerised forms of learning and the limited extent to which subject-appropriate learning strategies can in fact be employed has been central to our observations. Language teachers should be aware of this tension when introducing CALL to their students on a substantial scale.

Presage and Plan

The Course

The B.A. (Hons) in European Studies is a four-year social sciences course (political science, history and area studies). In addition, the curriculum dedicates about 50% of the classroom hours and nearly half of the credits to intensive, ab initio German or French tuition. The entire third year is spent in Europe (university plus six months as trainees in large enterprises). Despite the limited number of tuition hours possible (12 p.w.), students have to reach near fluency in the foreign language within only four semesters. They must pass internal and external language examinations before being allowed to go to Europe - a factor which exerts subtle but enormous psychological pressure. To help the students, the course set up a complex learning infrastructure. The core of it is a Self-Access Learning Unit (SALU), in which CALL is located. This ALP focused on the students of the German stream only.

The Students

Students are admitted on the strength of their AL results and upon successful completion of a non-standardised personal interview. The majority come from (lower) middle-class backgrounds and are fairly representative of the general HKBU population with respect to standards of English and Chinese. Upon admission, knowledge of contemporary Europe (or Germany) is non-existant or restricted to common cultural strereotypes. 'By default', interest for the course is centered around the offered 'free' year abroad. For want of native speaker contact and area-specific interest, motivation to acquire the language is therefore purely 'instrumental'. German is initially not seen as a means of communication but as a learning task, the outcome of which is measured through common testing procedures (see below). This attitude, though changing over the years, is significant for the acceptance of CALL. Students initially show the familiar behavioral patterns attributed to 'typical Chinese' learners - a reluctance to communicate freely in the target language and the expectation to be spoon-fed in class. At the same time, however, they frequently express dissatisfaction with 'traditional', 'Chinese' methods of teaching and learning and are remarkably open to innovations. These clearly conflicting ideas emerged sharply during the project. One of the crucial questions was the extent to which a computer-based learning component would reinforce one or the other.

The Plan

The ALP was concerned with the systematic introduction of commercially available CALL software to enhance and support the students' rapid acquisition of the German language. CALL activities were grouped within the SALU, i.e., they constitute an additional offer to the students rather than an obligatory training / tuition component. So as to allow effective and on-going use of resources, exercises available on the computer had to be aligned with the syllabus of the course's language subjects throughout the first four semesters.

Therefore, the first Action Cycle of the project was foremost concerned with the creation of a technical as well as a didactic infrastructure. Subsequently, the nature and quality of the software itself came under focus. In Action Cycle 1-A, an analysis was carried out so as to determine the instructional design of CALL-ware. On this basis, a second Action Cycle could be initiated which concentrated on students' acceptance of such measures - and the actual ways in which they went about the CALL learning tasks. This finally enabled us to determine the possible extent of CALL practice within our intensive language curriculum and to formulate guidelines for further CALL development.

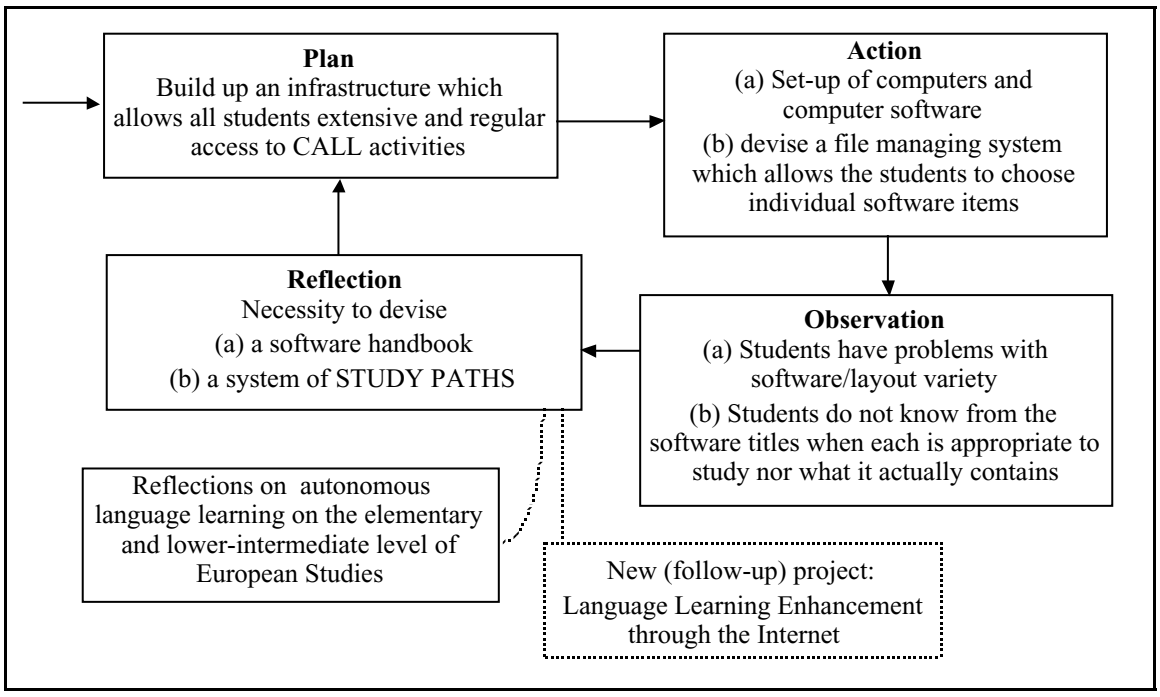
Action Cycle 1: The Necessary Infrastructure

Unlike English, 'minor' second languages such as German offer only limited market opportunities to publishers. We could therefore acquire nearly all software commercially available in Germany and the UK (Hong Kong has no market at all for such exotic commodities). However, the mere presence of roughly 30 titles (with virtually thousands of exercises) does in no way guarantee their usage. We had to create an accessible file system and make sure that students could actually 'navigate' through it in a way that would relate to whatever specific learning needs they might have at particular acquisitional stages. Figure 1 summarises the development of the necessary infrastructure.

Action 1: Structure of A Self-Access CALL Component

We refrain here from outlining the technical intricacies involved in this task. It actually took several months to download and systematise the software on a current total of 10 computers (PowerMac and PC) and to write an accompanying software handbook. The latter contains a short description of the software and an explanation of its working modes (including access and quit routines). This was necessary because the software runs on three different platforms (DOS, Windows and Mac), and each title sets its own parameters to enter, proceed through its exercise chains, ask for help and eventually leave it. Particular problems arise from the international setting. We use 'American' keyboards, the layout of which is different from French or German systems. Each software and/or platform 'solves' this problem by assigning different function keys to particular orthographic symbols of the German and French language. In each case, the arrangements must be comprehensible to students before CALL practice can even begin. The software handbook was essential as a reference guide, without which a multilingual self-access learning unit could not function.

Figure 1: Action Cycle 1



The main menu of the file system lists software titles per language with an eight character file name permitted in DOS environments. This system is, of course, far too crude. Students can hardly know what is hidden behind acronyms such as GIGRUND or DTGRAM. One software title may contain heterogeneous activities. GIGRUND, for example, originally comes in 32 floppy disks, with

up to 10 exercise clusters per disk, covering the entire basic grammar of German. Sensible use of such a collection requires the development of a second, finely-tuned guiding system in order to avoid extensive - and ultimately: frustrating - browsing in a vast exercise graveyard. The ensuing solution was the creation of the Study Path system. The system was triggered by CALL but ultimately comprised all media formats suitable for language learning.

Action 2: The Study Path System

In line with the syllabus, the European Studies course uses a standard textbook for classroom tuition: THEMEN neu, vols. 1-3 (Aufderstrasse 1992-95). THEMEN was originally selected because it is widely used world-wide and serves as a reference basis for the design of language examinations by the German Cultural Centres, the Goethe Institutes. It prepares students quite specifically for the internationally acknowledged Zertifikat Deutsch als Fremdsprache, which is a prerequisite for obtaining student visas in the Federal Republic of Germany. It also corresponds very closely to the curricular goals of the European Studies course by a teaching / learning progression based on a functional / notional syllabus and an intricate linkage between explicit (grammar) and area-specific 'world' knowledge (Landeskunde).

We therefore decided to use the spiral progression of THEMEN as the backbone of an elaborate reference system. Self-study materials were correlated with each of the textbook's 30 topics (Themen) and the corresponding grammar / vocabulary introduction. CALL files were only part of that system since students should also have the opportunity to use other media forms / skills training such as listening practice, viewing (videos), reading and writing exercises. By being listed under a unified topic at a specified teaching / learning stage, the various materials automatically become linked among each other, and students may follow up both topic or grammar in diverse media formats. The ensuing preparation of specific Study Paths is, in fact, an enormously time-consuming endeavour. It entails

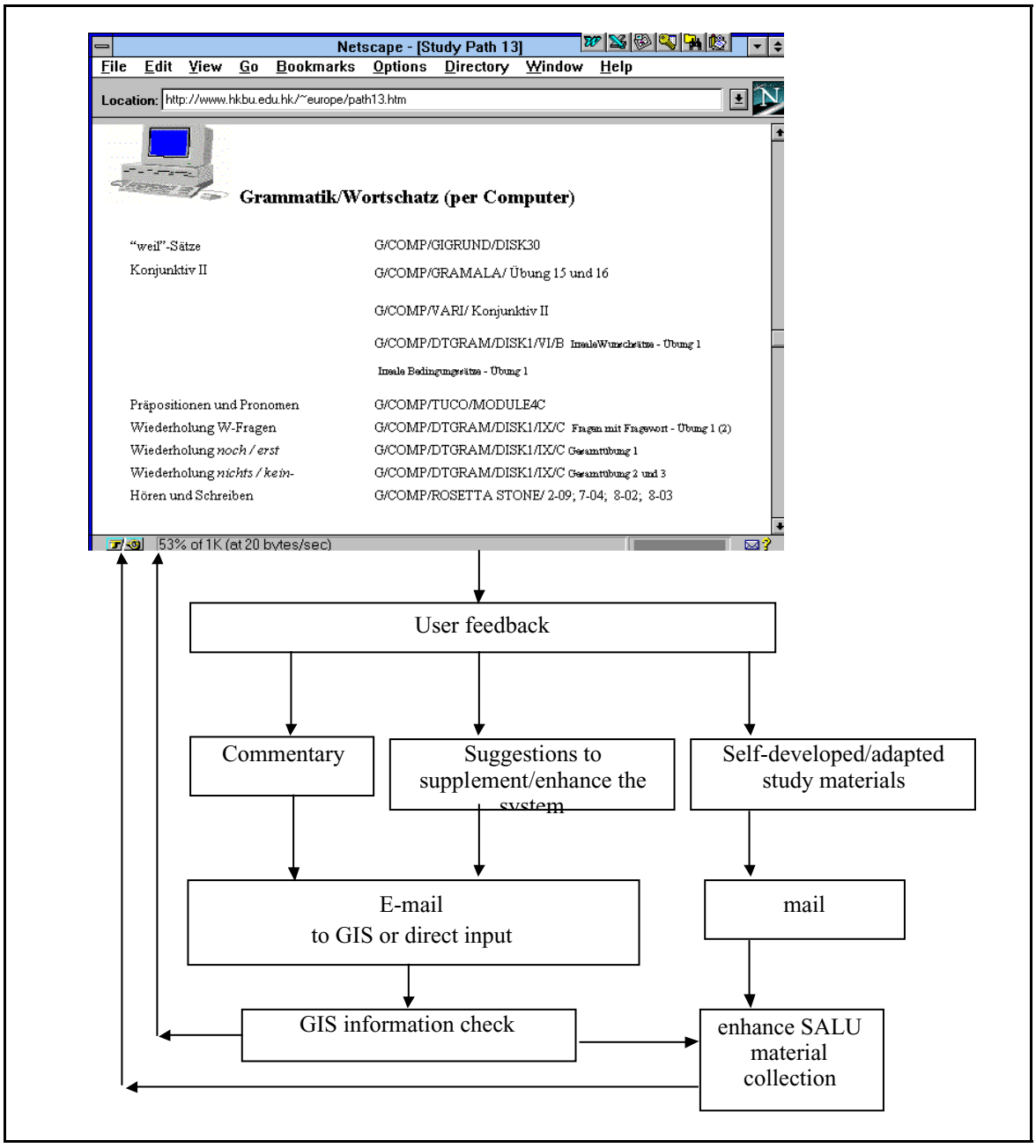
- the analysis of grammar and vocabulary content of each self-access material item made available to students;
- the 'deconstruction' of entire textbooks, software collections, video language courses, etc. into separate chunks according to the analysis;
- the realignment of these chunks with the *Study Path* system; and
- in many cases the elaboration of answer keys (without which sensible self-access learning cannot take place).

An exerpt of a Study Path is given above in Figure 1a. The objective was to provide an extensive system of learning opportunities which students could choose from according to their own needs and preferences - while always being assured that each item selected would correspond to their particular level of acquisition reached.

Once it was in place (after an initial preparation period of approximately 10 months), students have found the Study Path system extremely helpful and made extensive use of it whenever they entered the SALU. Because of the systematicity, students could work through a far larger number of exercises than they would have if they had been required to browse (search) before focusing on practice (exercises). However, this also increased the demand for more references per Study Path - to an extent that we could no longer handle alone. Upon reflection, therefore, we decided to offer collaborative construction and further elaboration of Study Paths to interested colleagues outside our own institution. This was conceivable because of the global distribution of the underlying teaching method (THEMEN neu) and the fairly similar functional / notional syllabus for elementary language teaching across different teaching methods. Since December 1996, the entire Study Path system is accessible on the Internet (http: / / www.hkbu.edu.hk / ~europe / themen.html), and

interested colleagues - be they in Tokio or Buenos Aires - have been invited to use the references in their own teaching / learning environment. In turn, they can provide further references to individual Study Paths by e-mail, which are then, upon confirmation of their suitability, fed into the website (see Figure 2).

Figure 2: Language Learning Enhancement through the Internet



Observation and Reflection: 'Autonomous Learning' in Context

The *Study Path* system has been welcomed by students, as TAPs indicate:

> I look through the (Study Path) and check it out - look which programme is appropriate to work on. (...) It's very good. It's very clear. We don't have to open every file in every programme. (TAPKipp12)

> Because we have the Path we can look in the file and we don't have to go to the library, check out every book which is appropriate for us and we can easily find any exercise in the computer. (TAPKip16)

Our students must use the SALU for at least three hours per week in addition to classroom tuition. Since the Study Paths were introduced, most students have come more frequently and stayed for far longer hours than required. Preferred media formats are video tapes and CALL, both of which are extensively listed in the Study Paths. The Action Cycle 1 has therefore been successful. The underlying pedagogical implications, however, clearly bring us into conflict with the current philosophy surrounding self-access learning (e.g., Gardner / Miller, 1994; Lai, 1993).

The idea of designing specific Study Paths is not new. In the Hong Kong context, Cooley 1993 introduced the concept (referred to as 'study guides') - and was promptly met with heavy criticism. At least in theory, a 'critical humanistic approach to self-access' (Pang, 1994, p.29) is commonly favoured, based on concepts of 'democratic education' (Dickinson, 1987, p.27) and situations where 'independent individuals (...) think for themselves' (ibid., p.11). This is the age-old principle of 'learner autonomy', as propounded by authors such as Dickinson or Holec (1987, 1992). Locally, much has been written on attempts to 'educate' students to become more 'independent', which — lamentably - they do not seem to be inclined (e.g., Martyn / Chan 1992; Martyn / Voller, 1992; Martyn, 1994; Or, 1994; Moynihan Tong, 1994; and other contributions to Gardner and Miller, 1994). Clearly, Study Paths or study guides take away a certain portion of 'learner autonomy' as they channel students' attention to what is deemed desirable or appropriate by teachers. Benson (1994, pp.9-10) is a particularly outspoken critic of such measures and advocates that students 'create their own categories, criticize resources and devise methods of using them which meet their own goals' instead of simply 'consuming commodities'.

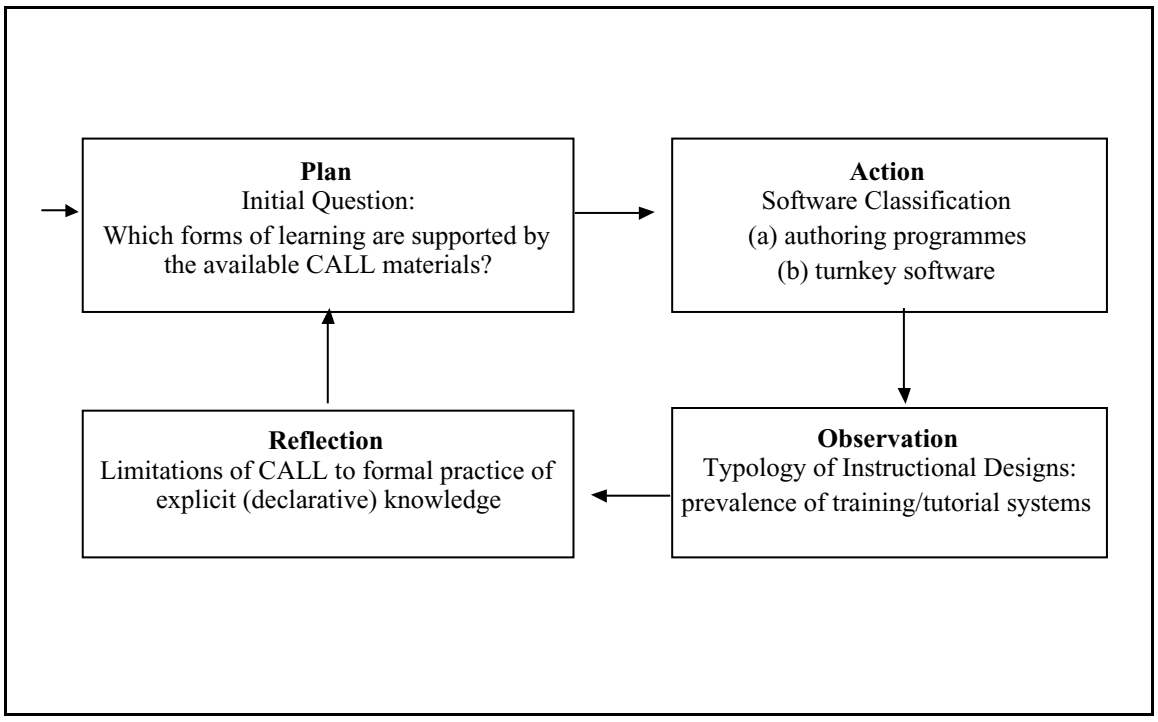
The cultural revolutionary rhetoric, however, cannot disguise that this is a theoretician's perspective, which students do not necessarily share. To them, a self-access learning centre is a service unit, which they frequent with clear, though possibly narrow goals in mind. Foremost among our students is the desire to depart for Europe at the end of the first two years. The language objectives are clearly set out in the curriculum, and students measure the worth of self-access in the extent to which the SALU contributes to that end. By its locus within an intensive language course on the elementary / lower-intermediate level, the students utilise the SALU as a remedial tool for exam preparation and self-assessment. This attitude is fostered by the very nature of CALL software, as we will see below.

To us, it appears to be a legitimate student demand not wanting to waste one's time in searching for adequate study material - and a legitimate claim to teachers or SALU providers to arrange and classify material accordingly. This does not preclude a gradual increase in 'learner independence'. After all, Study Path references are continually growing in numbers, refer to various media formats (and therefore allow learning activities for diverse learner personalities and / or cognitive styles), and are by no means obligatory to follow. But the classification scheme secures a minimum of orientation within an otherwise chaotic selection of heterogeneous self-study material, which no prior '(Learner) Training for Independence' (Moynihan Tong 1994) can possibly help to sort out within a reasonable amount of time.

Action Cycle 1-A: Language Learning Software

Once the necessary infrastructure and the Study Paths were set up, we could analyse and observe in more detail what forms of learning were supported by the software (Action Cycle 1-A, see Figure 3 below). The full analysis showed a paradox: The 'modern' technology was, in pedagogical terms, quite outdated. As it is, CALL still follows the concept of 'programmed instruction' of the 1960s - eye-catching 'multimedia' gadgetry in some cases and lipservice to 'constructivist theories' notwithstanding and despite significant advances in second language acquisition research. The obvious conclusion was that current CALL formats are possibly useful if formal practice of explicit linguistic knowledge is followed by equally formal assessment - but possibly less so if the goal is implicit, procedural knowledge acquisition, as in most curricula of today. With regard to learning theory, therefore, CALL appears to be a retrogressive, rather than progressive educational tool.

Figure 3: Action Cycle 1-A



Action: The Instructional Design of Language Learning Software

Using the classification of Bodendorf (1990), the instructional design of a total of 30 software titles for German was analysed. Six of them were 'authoring programmes' which provide instructors with task shells to create their own tailor-made exercises. The other 24 titles were 'turnkey programmes', i.e., ready-made collections of exercises and exercise chains with no possibility to (or need of) further modification. The latter vary considerably in length and scope. They may serve for an (estimated) mere 60 minutes of practice (e.g., 'BKID / Elektronischer Rechtschreibtrainer') or contain numerous sub-files allowing for a total of at least 80 to 100 hours of CALL activities (e.g., DTGRAM / 'Lehr- und Übungsprogramm der deutschen Grammatik'). Under the Study Path system outlined above, students normally spend about ten to fifteen minutes on one of these sub-files. Surveying the entire software collection, we came up with an estimated potential of 600-800 hours of CALL practice. This is roughly the equivalent of classroom tuition within Years I and II of the course - an enormous amount which, if done only in part, would surely have an effect on learning achievements.

However, the software titles are not linked to a specific textbook used in classrooms, hence not to the course curriculum. They are without exception stand-alone programmes. The integration into the Study Path system, therefore, had to be based exclusively on grammatical and lexical criteria (instead of content / topics) - a factor which is significant for the role CALL can currently play.

Training and Tutorial Software

In general, language learning software of the elementary level is only of the so-called training or tutorial system types. Training systems are based on the assumption that complex learning processes can be broken down into small, narrowly defined presentation steps of the material to be learned. The isolated item is presented in a model task and then trained through mechanical, repetitive drills until an automated (subconscious) pattern is formed. Typically, the taxonomy of learning tasks is derived from descriptive linguistics, i.e., students are advised to practice, say, 'the subjunctive II' or the 'attributive use of adjectives'. Training programmes do not normally provide introductions nor complex feedback functions but 'assume' familiarity with the respective grammatical paradigms / vocabulary to be trained in short 'fill-in-the-blank' or multiple choice exercises. Training systems typically use scores (number or % of correct answers) to increase 'motivation' in a competitive learning environment. They are entirely 'externally controlled' (Robinson, 1991) in the sense that exercise chains are pre-determined and learners cannot influence the pace nor internal sequencing. A danger inherent in training (and tutorial) session is the gradual demotivation of students through repeated negative feedback.

Tutorial systems differ from training systems to the extent of added, optional explanations (introductions, summaries). Task types are largely identical to those in training sessions (text matches, multiple choice questions). But because of their possible introductory function, tutorials provide a measure of response-sensitive feedback. The programme then 'recognises' the specific character of certain leaner errors and 'answers' accordingly. This should ideally lead to the development of 'internal' or self-' control' over the learning task. The TUCO software in our collection, for example, reacts to incorrect German word order with the remark 'Falsch (wrong). Remember that the conjugated verb must be the second grammatical element in the sentence', allows the user a second (and third) attempt and / or refers her / him to elaborate tutorials of the grammatical rule inventory in question. In theory, this gives the student a larger degree of flexibility and the development of so-called 'positive self-efficacy judgments', in other words: the student feels she / he 'can cope' with the tasks at hand (Robinson, 1991, p.158-59). However, our students have mostly ignored tutorials and rather relied on previously gathered knowledge from the classroom. Moreover, the fact that the 'discussion' between user and software is exclusively focused on metalinguistic rules often complicates the task for the student who is not always familiar with the terminology.

> (Student works on TUCO / Module 4 / K, types 'Der Wagen werden von den Kinder gewascht'. Feedback on-screen: 'Check the conjugation of your verb'.
>
> I don't know what conjugation means. (...) Maybe I rearrange the sentence or just change the verb, just look like in other sentence. (TAPDorp12)

Our TAPs show frequent student frustration if errors are not explained in familiar terminology; subsequent correction attempts result in even more grammatical or spelling mistakes. Differentiated, fine-tuned feedback in tutorial software is and will be the exception - not the least because of the enormous programming cost, as we have experienced by ourselves in creating pilot files with the authoring software '*Question Mark Designer*'.

Characteristic for both training and tutorial software is a focus on grammatical and orthographic forms and an insistence on accuracy. Tellingly, *simulation systems,* which go beyond receptive skills training on the phrase / sentence level do not yet exist in the field of German foreign language

training. *Simulations* are characterised as 'mental models of a real-life object or process' (Bodendorf, 1990, p.64), which learners can actively explore and manipulate so as to 'build up their own model of reality that reflects their comprehension and conception of information rather than focusing on the presentation of objective knowledge' (Jonassen, 1991, p.5). A simulation's equivalent in language pedagogy is, for example, complex role play. By contrast, everyday CALL practice with students shows that *content* and (non-linguistic) *context* do not play any role at all, and that there is no attempt to tie meaning of individual exercises / sentences into a larger 'model of reality'. The purpose of CALL in its present form is exclusively *instruction* of form-oriented knowledge - rather than *construction* of meaning and / or *production*. It is this characteristic which warrants caution when a large-scale CALL component is introduced into contemporary 'communicative' curricula.

Reflection: CALL and the Task of Language Acquisition

A comparison of these software characteristics with prevailing theories of second language acquisition may lead to some alarming hypotheses. The discrepancy between CALL in its present state and common assumptions about second language processing is indeed striking.

Modern language teaching, including our own curriculum, essentially follows the 'communicative approach', initiated in Germany by Jürgen Habermas' (1971) 'theory of communicative competence' (for the Anglosaxon tradition, Wilkins, 1976; Stevick, 1980; Brumfit, 1984; Krashen and Terrell, 1984; Nunan, 1988, 1988a, 1991, 1992). The approach has broad empirical and theoretical support from second language acquisition research (e.g., Dulay, Burt and Krashen, 1982; Klein, 1984; Ellis, 1985; Lightbown and Spada, 1993; Ellis, 1994). It is characterised by a dominance of informal, inductive and subconsciously operating acquisitional strategies, which are seen as far more effective than overt, form-oriented learning techniques (Wode, 1993). Following proponents of this 'natural approach', proficiency levels are reached through meaningful communication rather than overt instruction and memorisation of formal language properties. In recent cognitive theories of second language learning, the Chomskyan assumption of language as an entirely separate cognitive system has given way to an integrated model of knowledge acquisition (Bialystok, 1988) and a concurrent emphasis on learning strategies as utilised by individual learners in specific social and acquisitional contexts (e.g., Gardner and MacIntyre, 1992; O'Malley and Chamot, 1990; Ehrman and Oxford, 1990). The crucial differentiation between learning and acquisition and explicit / declarative knowledge and implicit / procedural knowledge, respectively (e.g., Bialystok, 1991; Ellis, 1990), has been retained and appears in language learning pedagogy as the contrast between the curricular goals of 'accuracy' and 'fluency' (e.g., Zettersten, 1986). It was observed that the accumulation of explicit knowledge, as it commonly occurs in formal settings, did not necessarily lead to active proficiency in the foreign language (Kadia, 1988; Sharwood-Smith, 1981) or was altogether unneccessary (the so-called 'zero option' advocated by, among others, Krashen; Ellis, 1994, p.652). Both knowledge types are possibly stored separately by the human brain and activated under different situational conditions (Bialystok, 1991). As a result, attempts have been made to re-create 'natural' conditions for acquisition and the fostering of procedural knowledge in environments of instructed language acquisition (the discussions in Ellis 1990, 1994). Language learning is seen as 'language socialisation' (Mohan and Smith 1992, p.81) where linguistic and other (world or cultural) knowledge form an intricate web. It is quite obvious that CALL software, as it was described above, does not lend itself to 'natural' acquisition.

However, the emphasis on 'natural' acquisition without further need to practice and consciously learn is not unchallenged (e.g., Nunan 1988, pp.81-84). This issue is a particularly delicate one in a Chinese context, where pure communicative approaches ('zero options') have repeatedly been criticised for their alleged cultural bias (e.g., Liu, 1982; Gu, 1987; Li Guanyi, 1990; Li Xiaoju, 1990; Ni, 1991; Hess, 1992, 1992a). 'Un-communicative' CALL, with its enormous amount of external control and its focus on explicit knowledge, may therefore be particularly appealing to Chinese learners confused by the demands of more conversational, 'natural' learning approaches.

Nonetheless, it is still unclear to what extent teaching of explicit forms - i.e., language learning - facilitates unconscious acquisition, as the so-called 'interface hypothesis' states (Ellis, 1994, p.654, 1990, p.193). In order to link learning and acquisition in instructional settings, Long (1991) proposes a 'focus on form', i.e., directing the 'learner's attention on specific linguistic properties in the course of carrying out communicative activities' (Ellis 1994, p.639) - as opposed to a 'focus on forms', i.e., the decontextualised instruction of linguistic structures. Due to their 'stand-alone' nature, however, CALL programmes clearly belong to the latter category in that they separate forms from function. Despite their possible attractiveness to 'traditional' Chinese learners, they may therefore not contribute to acquisition at all.

Action Cycle 2: Student Acceptance and Learning Strategies

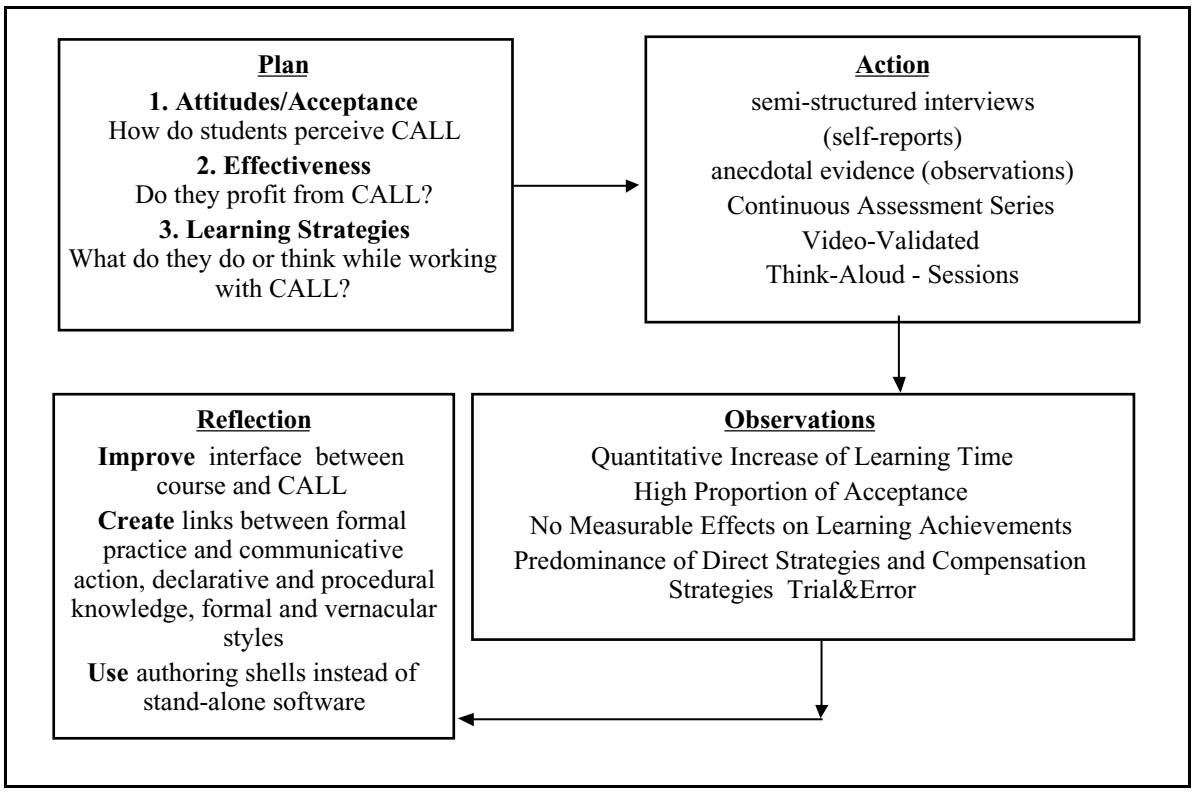
The picture which emerged from Action Cycle 1-A was rather gloomy. We were confronted with the possibility that by introducing CALL into the curriculum, we were creating a conflict between opposing paradigms of learning and language acquisition. CALL in its present form appeared to be, if not 'counter-productive', so at least not conducive to the curricular goals of the course. All the same, it needs to be stressed that this statement does not refer to the technology itself, but to the present lamentable state of the art of software development.

However, students themselves did not obviously share our concerns. While there has been criticism of the fairly simple cognitive routines, CALL has nonetheless proved to be a very popular learning tool. This is, first of all, a reflection of the fact that goals as formulated in a curriculum are not necessarily goals as perceived by students. And secondly, by inserting a formalised skeleton of graded proficiency assessments, we ourselves defined a presage which encourages short-term learning over long-term acquisition and ensures, for the time being, the popularity of CALL despite its obvious shortcomings.

Plans and Methods

Action Cycle 2 began with three questions. First, we wanted to get some more insights how students actually perceived CALL materials as part of their everyday routines of language learning and in light of their own goals of learning and / or acquisition of German. A second question was whether the newly established CALL component would have any noticeable effect on learning achievements. And thirdly, regardless of whether the answer would be affirmative or not, we wanted to gain some understanding of what students actually 'do' (or think) when they are in front of the computer screen. The following Figure 4 shows these questions, action taken, and some of the as yet tentative findings.

Figure 4: Action Cycle II



Students' attitudes reported here were elicited through semi-structured interviews following video-validated 'Think-Aloud' sessions with CALL. The latter were conducted with 12 students by the research assistant of the project as a participant observer, encouraging students to 'self-reveal' thought processes while attending to the CALL tasks, to 'self-observe' their actions in front of the screen, and to 'self-report' on what they thought was their common learning behaviour with the computer (Cohen, 1987 for a concise definition of these different types of verbal report). The verbalised thoughts and interviews were then transcribed ('Think-Aloud Protocols' or TAPs) and coded independently by the two authors in order to assess specific learning strategies activated by CALL. The overall acquisitional progress of the students was measured through a series of 14 proficiency tests throughout Years I and II of the course (see below).

Observation 1: Student Acceptance

The language testing series, combined with the objective to be allowed to go to Europe in Year III, proved to be the decisive factor for students' handling of CALL. It was assumed by the students - and indeed fostered by the systematicity of the referring Study Paths - that each CALL exercise indicated in relation to a particular classroom lesson would specifically prepare for the later test. As TAP quotations illustrate, CALL therefore became foremost a tool for exam preparation and self-assessment - and an effective one in the belief of the students, although the tests did indeed measure far more than explicit, grammatical knowledge.

> Why have you chosen this particular software?... this is very important for our examination I think - especially the reflexive verbs. (TAPKip1)

> Because this morning I had to do it (...) Because there will be an exam. This program (TUCO) have included the exercise that I want to study. (TAPFip1)

> It (the computer) provides me an exercise which can test my ability or the knowledge on this stuff. (TAPCalp4)

The view to forthcoming language tests does not mean that students erroneously equate CALL with a preparation of communicative practice. However, instead of 'criticising resources', students clearly accept the limits of the software provided - and use other means when appropriate. Students also clearly recognise the training character of the software. They assume that successful CALL practice (even with tutorials) can only take place after the relevant explicit knowledge has been gained in other contexts.

> Because usually student here normally when they use computers for the self-access they just want to do exercises about grammar and those stuff that relates to the lesson and me too - I want to do some exercises relating to the grammar and to the lecture that they have taught. / / It [the computer] is helpful but students should be - should do some preparation before. (...) Have a review on the grammar. Otherwise you will make the program not really useful. (TAPCalp9,4)

> I think before I go to this program to do the self-access I should get a revision first. I cannot just rely on this material. (TAPIap2)

> How do you usually get to your answers? According to what I learned in class. [...] What the textbook tell me, and what Dr. Hess and Frau Ng tell me. (TAPQuep8)

The last statement shows that, in the minds of students, learning still takes place in the classroom rather than by way of a computer-based tutorial. This is less an indicator of an extraordinary teacher-centredness but of the underlying conviction that language acquisition is ultimately a matter of interpersonal communication, as the following severe criticisms of CALL hint at.

> I seldom use the computer. (...) Computer programs is not really interesting. I just sit down and watch the screen. (...) (exercise starts on screen) Oh, another disaster! [...] But why don't you use the computers? I find them boring. / / Why boring? It doesn't meet my needs. Our need is to have an instant and quick answer and some more clear instructions to let me know what I am going to do and what's wrong with me and - but I think computers cannot provide this. What can provide it? Lecturers. (...) Yes, I prefer a person. / / Computer is only the last resource. When there is no other kind of alternative that helps me I would finally use the computer. [...] If there is any types of stuff that helps me such as by person or watching TV or playing game I would choose these stuffs instead of using the computer. (TAPCalp5,7,10)

> Up to now I don't think it [the computer] changed my way of learning because I don't think computer is a very good way to learn. (...) In fact, the programs of these computers is not so good. / / I think I can do the same thing without a computer. I think, for example, the notes from the lessons can have the same effect. (TAPMip22,23)

Despite these criticisms, the majority of students remains convinced of the worthiness of CALL. There are basically three advantages which were mentioned frequently in the interviews:

- the *quantity* of exercises offered;
- the *variety* and *ease of handling*;
- the *flexible timing* and *'face-saving' nature* of exercising.

The first two arguments are inextricably linked. The convenient access to a large number of computer-based exercises (by pressing a few buttons only), combined with instant correction / feedback (instead of referring to answer keys or asking for teacher correction) gives CALL the leading edge over other study materials. Students also appreciate the opportunity to

practise alone. The often quoted preference of Chinese learners for group work is not cherished - on the contrary. Not only does CALL spare possible embarrassment in class, it also forces students to rely on their own thinking and to come up with their own answers. The following quotations illustrate these attitudes:

> CALL Advantage: Quantity:
>
> I think the program in the computer is very helpful. (...) Because we, we don't have so many exercises. We don't have so many homework only for German so we only have to do some exercises in our school. They are not enough. (...) So it' s better for me to have many exercises with the computer. (TAPKip10,11)
>
> CALL Advantage: Variety / Ease:
>
> (...) because I am a lazy person and I want everything there on the computer. (TAPFip12)
>
> Because if you have just a workbook I should check the answers in the back but if I work with computer I just press return then the answer come. (TAPQuep5)
>
> CALL Advantage: Flexibility, Group / Teacher-Independent Work:
>
> I think the computer program is good. (...) You can try to do many times you like. You can do it alone (...) Just - usually when we are in the classroom we are all together to work with, but I can work with the computer here. The computer have - give the response to me. Just only the giving the answer and tips. Ja, but in the classroom - because when somebody here I would try to copy it. (...) I have time to think here. Nobody to compete with me. / / Sometimes I think you have to put some times that for yourself only to do the things. It's much better (than) a group. (...) It's better one people. (TAPFip30,37)
>
> Just learning how to analyse (...) because when you do it alone no one help you. Then you have to try to solve the questions by yourself. How the answer can be correct. (...) .... because I think the computer can help me how to work independently, think independently. (TAPFip38)
>
> You can use it anytime you want and it has a lot of information - the storage is large so you can have many exercises. / / So.... working on the computer is efficient, systematic (more than other ways). (TAPScp6,8)

Students accept CALL as one of several learning tools at their disposal, but they clearly do not feel that the technology itself brings a new quality of learning. To them, it is neither a thrilling nor a particularly fun-filled experience. With a matter-of-fact attitude, CALL is used as a means to accelerate what students are already doing anyway - formal practice. To the extent that formal practice is considered an integral and neccesary part of the learning process, students are quite happy to increase the amount of it enormously. However, CALL certainly does not replace teacher / student interaction, nor does it in any way affect the desire to engage in 'real' communicative action.

Observation 2: CALL Effects on Learning Achievements

Within this project, the focus was on the gradual build-up of infrastructure and resources. We did not have the opportunity to conduct controlled experiments to assess the effectiveness of CALL. The groups involved are anyway too small to be of statistical significance so that the following results should be read as hypotheses which would have to be tested in further experiments. Effectiveness studies have, in general, proved to be extremely difficult and largely inconclusive,

not the least because of the enormous range of possible causes for learning in a non-experimental field (Dunkel, 1991).

Figure 5: Continuous Assessment Scheme (Language Testing): Year I Sample: Test 4

	Skills	Tasks	Score
A	**Isolated Skills**	1. Listening Comprehension	10
		2. Reading Comprehension	12
		3. Speaking	15
		4. Writing	9
B	**Isolated Subskills**	5. Lexical Comprehension	9
		6. Grammatical Comprehension	10
		7. Phonological Comprehension	5
		8. Orthographic Comprehension	5
C	**Combined Skills**	9. Conversing (Listening / Speaking or Writing)	10
		10. Corresponding (Reading / Writing)	15
	Total Score:		**100**

We did, however, regularly conduct comprehensive proficiency tests to evaluate students' overall progress in language acquisition. A total of 14 tests has been designed for Years I and II of the course (roughly one test after two textbook lessons or 3-4 weeks of classroom teaching). In the classroom and in accordance with the textbook used, skills are taught integratively. Formal properties of the language are introduced within a spiral progression on the basis of communicative functions / activities which require specific linguistic means (the 'focus on form' approach proposed by Long, 1991, see above), which are introduced inductively. The continuous testing series (Figure 5) follows this approach by assessing all basic language skills separately and in combination (Doye, 1988 for an analysis of test tasks), always centered around a specific content matter previously dealt with in the classroom. Since the basic format of the testing series is kept steady over the length of the course and for different student groups, the tests deliver a fairly accurate and reliable picture of the overall progress of students, including active and oral / communicative skills.

Assuming that the 'interface hypothesis' is correct, we can expect that language learning, as it was extensively endeavoured with CALL, should be noticeable in the overall proficiency of the students - if not through the 'unplanned' discourse elements of the tests, so at least by way of the more structured test portions. The overall score of students should therefore improve after CALL was introduced systematically into the curriculum. This, however, was not the case.

We had two student groups. For the first group (1994 intake), the SALU (and CALL) became available at the onset of Year II, i.e., after Test no. 6 out of 14 (Test 13 was not administered for time constraints). The second group (1995 intake) already started with a fully operational SALU / CALL component. The average score of the 1994 intake did, in fact, not improve after the introduction of CALL (Figure 6). The 1995 intake generally scored higher than the first group, but it is doubtful whether this is caused by CALL. The second intake's average scores even fell during the observation period, despite the availability of CALL (Figure 7). However, when looking at the graphs of individual students of the first intake, an improvement of test scores of some weaker students can be seen, while the top students in the group have obviously not profited at all (Figure 8). This points to earlier studies showing that 'slower learners and underachievers seem to make greater gains in learning as a result of using CAI than do higher-ability students' (Dunkel,

1991,p.16). The results for the second student intake (of 1995), however, did not confirm this pattern (Figure 9). There must have been other variables which influenced overall performance about which we can only speculate. The first group, for example, was taught by the authors of this paper, the second group by other teachers. It could well be that students in the first group were more frequently encouraged to use CALL - in which case it would not be the absence or presence of CALL making a difference in learning achievements but the intensity of CALL practice.

Figure 6: 1994 Student Intake: Average Testing Scores (n=14)

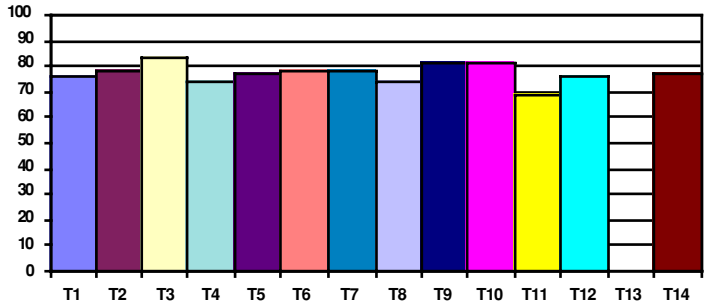
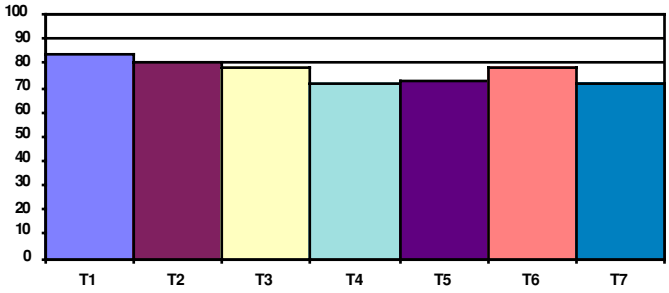


Figure 7: 1995 Student Intake: Average Testing Scores (n=13)



Another observation was the gradually narrowing gap between top and bottom performances in the first group. After the introduction of CALL, the weaker students rapidly caught up, while the top students' performance level slightly declined. Thereby, the gap was narrowed from a height of 52 percentage points to an average below 30 points (Figure 10). Again, however, the second group did not confirm the pattern. Variation within the group was initially much lower (which could not have been an effect of CALL). When comparing tests, differences were consistently lower than for the first group (which may or may not be an effect of CALL). But overall, they actually became larger during the observation period (Figure 11). CALL did obviously not benefit the top students, but neither did it help weak students of this group.

Figure 8: Individual Test Performance (1994 Student Intake)

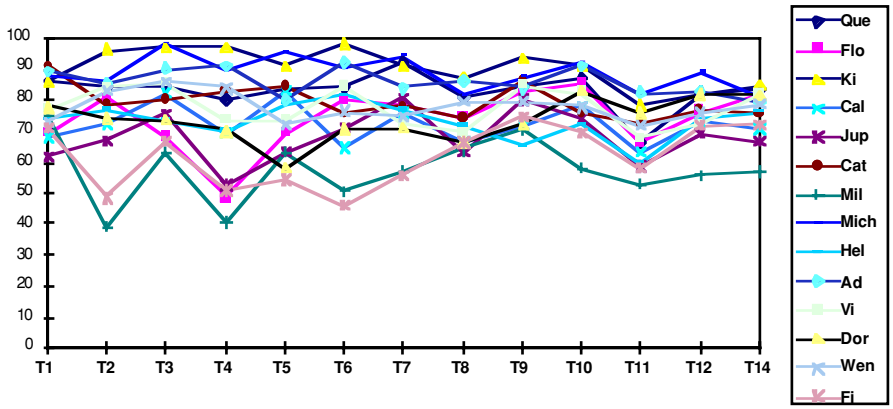


Figure 9: Individual Test Performance (1995 Student Intake)

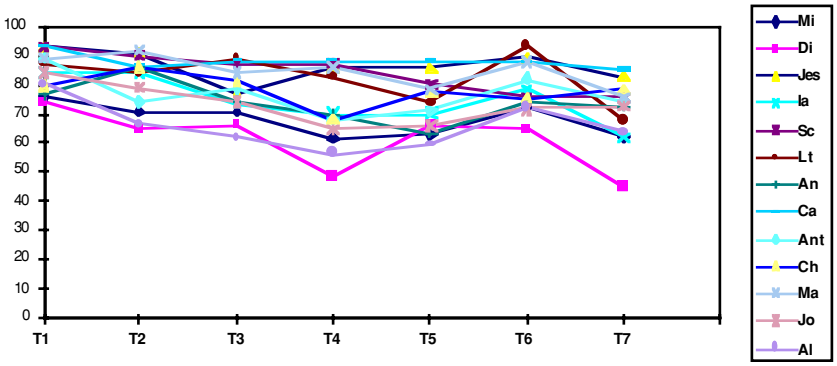


Figure 10: Difference between Top and Bottom Scores (1994 Student Intake)

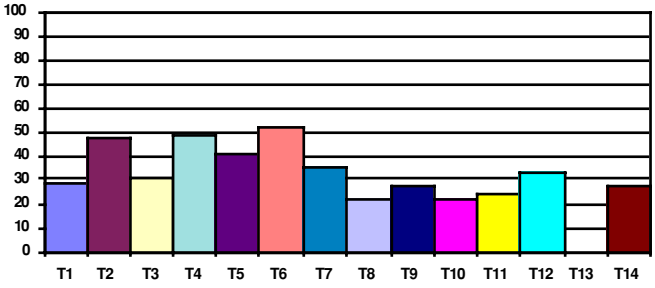
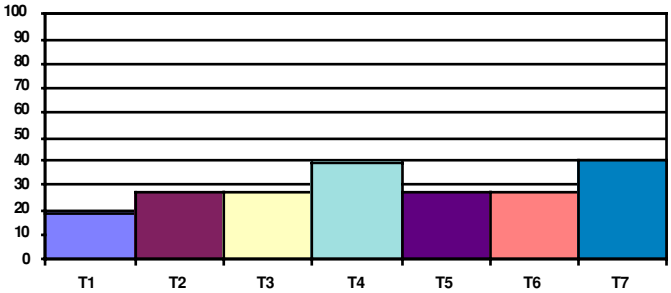


Figure 11: Difference between Top and Bottom Scores (1995 Student Intake)



Evidence from testing performances is therefore at best inconclusive. There is neither a striking positive effect of the introduction of the CALL component, nor is there an indicator that CALL had any adverse effects on language acquisition. Again, however, it needs to be pointed out that these data do not allow a generalised statement about CALL since we made no attempt at controlling intervening variables in an experimental design and the small groups observed are not statistically significant. There is also the possibility of delayed effects of CALL, as the 'variability hypothesis' would suggest. Overall, however, we could find no clear indicator for the vailidity of the 'interface hypothesis'. Despite allegedly favourable dispositions of 'Chinese' learners, increased learning exposure did not lead to improved acquisition, nor was the use of the new technology in any way more effective than 'traditional' means of learning / instruction.

Observation 3: Learning Strategies

We finally looked at ways in which students actually went about the learning tasks. The data came from informal observations and talks to the students, comments provided by the students on weekly 'self-study activity logs' (SSALs) and TAPs (see above).

There is a striking similarity of students' comments - CALL was at the same time characterised as 'useful' and (quite often) 'boring'. The boredom stems from the aesthetically poor surface design of much of the (still largely DOS-based) software. In addition, we observed numerous instances where students simply stopped working because of missing or confusing screen instructions. Particularly striking is the aversion to text-filled screens. Attempts to work with THEMENARBEITER, for example, a programme designed to train reading comprehension strategies, were regularly abandoned.

Students clearly prefer simple programmes over complex ones, word- or phrase-bound exercises over CALL material dealing with text comprehension, training programmes over tutorials. This preference, however, did not prevent them from criticising the repetitiveness of most exercises:

> (GIGRUND) The challenge is very little because you get the same pattern exercise. You can guess what is the format of the following sentences. (TAPDorp26)

Predictably, then, a sample analysis of the learning strategies employed by seven students in 'Think-Aloud' sessions revealed a clear dominance of direct strategies dealing almost exclusively with explicit knowledge.

Ehrman / Oxford (1990) distinguish two basic categories of learning strategies:

- *direct strategies*, i.e., active mental processing of the target language
- *indirect strategies*, i.e., the organisation of learning, establishing relations between the language to be learned and non-language referents, and attitudes towards the learning task and matter.

We modified this system by adding CALL-specific compensation strategies and 'non-strategies' (or failures to cope with CALL). Compensation strategies do not involve reflections about the language itself nor relating the task to non-linguistic factors, but make use of clues on the screen itself (e.g., character length of a blank).

The sample analysis (Figure 14) shows that roughly half of all observable strategies dealt directly with the target language structure itself, either by deduction or recall of a grammatical rule. This is matched by a relatively low frequency of observed indirect strategies (0% to 23%). The TAPs confirmed that CALL practice is largely cut off from any other target language activity - a consequence of both the 'stand-alone' nature and the instructional design of the software.

A further 23% to 47% of observed strategies were CALL-specific compensation strategies, which are employed more often by weaker students. By far the most frequent of these were simple trial &

error strategies. Alternatively, they resorted to HELP or tutorial screens or simply called up the correct answer without trying by themselves. The answer patterns then serve as 'blueprints' for further exercises - without actual linguistic involvement:

> (When you are working on the computer ... how do you get to your answers) I will find the rules of the pattern. (How?) Learning from the wrong. And just like the exercise I will find that there is any pattern that the exercise has, something like - for example, that I should not make use of the whole blank. I should leave a space, so that lets me know that the answer is correct. Or I can use the three tries the computer gives me, so that - even though that I type something I don't know is this wrong, but as I want to know the answer I have to type whatever I want. But I think it's better to have something like help. And either function that I can directly get the answer. (TAPCalp42-43)

> (...) at the beginning I always look at the correct answer so I can get a model, an idea that I can do with the following exercise (TAPDorp24-25)

A comparison with overall grades in language subjects shows that students who manage quite well in 'traditional', non-CALL learning environments, do evidently not need CALL or even tend to shy away from it so as not to be impaired in their positive self-image. Weaker students, by contrast, apparently use compensation strategies successfully to build up or copy patterns, which they then link with direct stategies. However, as we have seen above, this does not necessarily improve their overall performance in the target language, unless the effort is sustained over a long period of time (student 'Fi').

Figure 12: Observed Learning Strategies during CALL Practice (Sample)

Student (Tests 6/14 grades at the beginning and end of the observation period) learning approach (measured by SPQ; cf. Biggs 1992)	Mi (A-/B+) surface-deep	Ki (A/B+) deep-achieving	Que (B/B+) surface	Hel (B/B-) surface-deep-achiev-ing	Dor (C+/B) deep	Cal (C-/C+) surface-achievin g	Fi (F/C+) deep-achiev-ing
total no. of observed strategies:	**35**	**17**	**106**	**56**	**59**	**73**	**56**
total no. of direct strategies **(% of total)**	**7** **(20%)**	**10** **(59%)**	**72** **(68%)**	**35** **(62%)**	**28** **(47%)**	**37** **(51%)**	**23** **(41%)**
total no. of compensation strategies **(% of total)**	**8** **(23%)**	**3** **(18%)**	**30** **(28%)**	**11** **(20%)**	**26** **(44%)**	**34** **(47%)**	**17** **(30%)**
total no. of indirect strategies **(% of total)**	**7** **(20%)**	**-**	**4** **(4%)**	**4** **(7%)**	**5** **(9%)**	**1** **(1%)**	**13** **(23%)**
total no. of non-strategies **(% of total)**	**13** **(37%)**	**4** **(23%)**	**-**	**6** **(11%)**	**-**	**1** **(1%)**	**3** **(5%)**

Reflections (Summary)

We began the project with considerable enthusiasm and a positive attitude towards 'the computer' which has been shared (though not uncritically) by the students ever since. The CALL component continues to be one of the most attractive and most frequently used features of our self-access learning unit. But the experiences gained with the software were also quite sobering and led us to the following conclusions.

First, 'the computer' is only useful if a parallel guiding system is established to provide extensive linkage between the software (parts) and the syllabus. The crucial aspect is not the technology itself, but its integration into the curriculum. We have therefore spent a major portion of the project time in devising a user-friendly and comprehensive system of Study Paths. There must be a clear relationship between CALL (or any medium of self-access learning, for that matter) and the goals pursued in a given course. Once this relationship was established, students have accepted the usefulness of CALL in good faith, despite individual dissatisfaction with some CALL aspects, as reported above. In our case, the specific presage conditions have contributed to this acceptance, namely the clear objective to pass language examinations prior to the sojourn in Europe - and the relative lack of potential native speaker contact in their Hong Kong learning environment. We doubt that in a different environment, students would as patiently persist with CALL as they have done in our case. The pedagogical task is complemented by a technical challenge, i.e., the adaptation and integration of heterogeneous software types and layouts into one comprehensive, 'user-friendly' system. Without heavy investment of time and manpower in both, a CALL component should not be attempted. To believe that even 'computer-literate' students will use unadapted CALL material 'autonomously' is, from our experience, wishful thinking.

Second, the introduction of CALL in itself does not change the quality of the language teaching / learning process. Instead, we currently reinforce a perception of language learning as a process of accumulating explicit linguistic knowledge and of pattern automatisation. Undoubtedly, 'traditional Chinese' learning strategies have been encouraged by CALL. But our observations also show that students do not uncritically, and certainly not unanimously, accept the algorhythms of learning embodied in training / tutorial software and rather seek other opportunities of functional practice elsewhere if this is what CALL cannot provide.

CALL can become a lifeline for students having difficulties to catch up within more informal, inductive and conversational teaching approaches - but again only to the extent that CALL is visibly linked to the classroom syllabus. In itself, increased formal practice is nothing lamentable. But it needs to be supported by opportunities to apply conscious, 'controlled' knowledge in communicative action, so that declarative knowledge can be converted into procedural knowledge. This is, for initial want of extensive native speaker contact, of course the prime object of classroom communication. In this sense, extensive CALL practice in a self-access context does allow considerably more time for communicative action, and it should always remain an additional offer to students believing to be in need of conscious self-instruction. Some of our students have, in fact, pointed out on various occasions that CALL was useful just because the classroom tuition did not provide enough possibilities to clarify formal aspects of grammar. CALL may therefore be a welcome counterbalance to a 'communicative' curriculum. But as such it appeals only to some students, while others apparently profit very little from it.

CALL (like other forms of declarative knowledge training) does, however, not obviously accelerate language acquisition, as the 'interface hypothesis' suggestes. This is quite evident from the fact that overall learning achievements have not improved through CALL.

Third, a top priority in the further development of CALL must be an intricate 'interface' between topics / notions relevant in communicative action and classroom tuition with formal practice offered by the computer. It was, in fact, the single major disadvantage of the available software to

be, without exception, stand-alone programmes. None of them could bind the practice of forms to their application in other contexts, nor did they arrive at the cognitivisation of rules by inductive approaches. This may seem an academic fine point of discussion, but the consequences for building up a successful CALL component are drastic. It is less the technological finesse of the software (for example, its multi-media character) which brings about improvements in the future, but the degree of fine-tuning with the syllabus in each course and with other media forms and information sources.

This calls for the increased use of authoring shells by teachers themselves and, of course, raises the question of time and financing. An accumulation of ever more stand-alone software, albeit graphically or acoustically 'enhanced', does not solve the basic problem of content/forms separation found in all of them. Our conclusion would therefore be to limit the number of software in a CALL component and 'tailor-make' CALL exercises to fit in with the course syllabus. This, of course, rests on the assumption that institutions wishing to use CALL for increased teaching/learning efficiency acknowledge that the main investment is not in the technology but in manpower used to adapt it to the specific learning situation.

Acknowledgment

The authors wish to express their gratitude to Dr. Atara Sivan, Department of Education, HKBU, who acted as an independent observer of this project, for her constructive comments. It goes without saying that all inconsistencies or errors in this paper are entirely our own responsibility.

Software Quoted

BKID: Der elektronische Rechtschreibtrainer für Kinder. München: Rossipaul 1995

DTGRAM: Dreyer, H., R. Schmitt. Lehr- und Übungsprogramm der deutschen Grammatik. Ismaning: Verlag für Deutsch 1995

GIGRUND: Puchta-Mähl, C. Übungen zur Grundstufengrammatik. München: Goethe-Institut 1989

TUCO: Ohio State University-Department for German (ed.). Tutorial Computer. New York: Gessler 1987

A full list of the software used in this project is available in the Internet under *http://www.hkbu.edu.hk/~europe/ind.htm*