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German as a foreign language

The potential of CD-ROM technology for integrating language and literature: student perceptions

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This paper investigates the effectiveness of a CD-ROM designed to integrate the teaching of language and literature in an advanced German course at two Australian universities. The CD was built into the work of three groups over a four-week period, and emphasis was given to student perceptions of the approach using quantitative and qualitative measures of data-gathering. Results showed a high level of interest in the approach, with students reporting that they found the integration of language and literature useful and interesting. A substantial number found it more effective than conventional teaching in which language and literature are treated separately. Of the components of the program, games were seen as most enjoyable but structural exercises as most effective. Performance in the post-tests was significantly better than in the pre-tests. While students generally enjoyed working with the CD-ROM, most believed that this technology should not be used as a stand-alone approach to teaching, appreciating the presence and feedback of the teacher at all times.

0 Introduction

If we compare sophisticated multimedia applications with even the best pre-multimedia CALL programs, the difference in presentation alone is stunning. CD-ROMs include colourful graphics, moving pictures, interesting soundtracks and clever icons, behind which learners can explore unforeseen scenarios, play games or carry out all sorts of exercises. There is no question that learners prefer to interact with these programs rather than the previous generation of software, even if the latter may at times be of greater pedagogical value. The motivating effect that has often been observed in CALL (Jones 1991) is now greater than ever, even though there is virtually no research on how long-term this effect may be. We need to be cautious, however, in what we choose for our students, and Jones (1991:1) is right to assert that state-of-the-art software is not necessarily more valuable than “minimalist home-made” programs. As far as he is concerned, the important variable is the presence of the teacher in the production. Given this, the soundest programs should be those that are state-of-the-art but produced by a team of programmers and language educators in partnership (MacWhinney 1995, Garrett 1995). And Phillips’ claim that “the days of the gifted amateur programmer are numbered” (in Jones 1991:7) is only true in the sense that authoring programs for CD-ROM

programs have now become so sophisticated that most teachers need help if they are to produce excellent software. The latest software available for Web authoring, by contrast, offers much easier solutions to the amateur (Felix 1998a).

Pedagogically sound multimedia language programs on CD-ROM offer an attractive addition to already good teaching. They can cater for different learning styles, abilities, strategies and interests; they can provide a large amount of linked material on language, literature and culture in the form of tutorials, games and contextualised exercises; and they can do all this with one flexible resource that students can access at any time and even take home if they have the appropriate hardware. Not even the best teacher could hope to provide all that in the regular classroom environment without collapsing under the burden of coordinating technological resources and preparing suitably graded materials for each class (Felix 1997). Integrating such a resource into a teaching program, however, could add an exciting and useful dimension to the learning and teaching environment. Exactly how useful such an exercise might be is the subject of this paper.

The software evaluated in this study was developed by the author with the help of professional programmers in response to a genuine student need. The program, *Theater Interaktiv*, differs from commercially available CD-ROMs for language teaching in several ways. It is aimed at advanced language learners; it uses the target language (German) exclusively; it brings together language and literature teaching when the standard practice in Australian universities has been to teach them separately; and it includes a large variety of comprehension and grammar exercises based on Thomas Bernhard's *Heldenplatz* (Bilbilothek Suhrkamp), with scored feedback. The program is personalised in that the teacher appears in video clips giving informative and amusing tutorials dealing with the most difficult areas of grammar for advanced students of German as a foreign language. Users can switch between games and serious work, and the program includes extensive background material on the author, the play and the historical context. More detailed information can be found in Felix (1998b) and a selection of still images can be accessed at

<http://www-personal.monash.edu.au/~ufelix/ti/>.

An important consideration in this study was that the software was evaluated within the students' regular teaching program and environment. While this limited the research design and the generalisability of the findings, it was felt that information gathered observationally in an

authentic teaching environment would be more useful than anything that might result from an artificially controlled experiment.

In any case, research into the efficacy of computer assisted learning has produced very equivocal results (Dunkel 1991), and it is easy to list problems attached to such research (Chapelle 1997). Judgments in the area vary widely. At one end are positive reports from the authors of several large meta-analyses as exemplified in "the computer did its job quickly – on average in about two-thirds the time required by conventional teaching methods" (Kulik et al 1980:538), and "the newer technologies show promise to be able to provide feedback in multiple modes, such as listening and reading" (Basena & Jamieson 1996:19), although they did caution that "the results are difficult to interpret, and the designs and measures do not lend themselves to reproduction or generalizability" (p. 19). At the other end are dismissive (and in the quoted case unsubstantiated) comments such as: "Study after study seems to confirm that computer-based instruction reduces performance levels and that habitual Internet use induces depression" (Noble 1998:2). Given this variation, it is fairly clear that general conclusions about the effectiveness of CALL cannot be formulated without qualifications nor relied upon uncritically. What is more, the problem is going to intensify: as programs became more sophisticated, variables to be investigated became more wide-ranging and conclusions on meta-analyses more difficult.

The focus of the present study was on students' perceptions of the usefulness of the software. In particular, the study was designed to elicit the following information.

- Students' level of interest in working with a multimedia package.
- Which aspects of the multimedia program students found most effective and enjoyable.
- How effective the program was in teaching difficult aspects of German grammar.
- Whether students found the teaching of grammar in the context of a literary text useful.
- Whether the program is best used in a classroom setting or as a stand-alone resource.

1. Method

Because of the difficulties associated with controlling variables in a natural educational environment, this was not an experimental investigation, but an observational study with the addition of pre- and post-tests to measure improvement in certain aspects of grammar. While the multimedia software was designed to teach a variety of language skills (Felix 1998b), grammar was chosen as the content for the pre- and post-tests. One reason for this is that

understanding of grammar items lends itself most easily to quantitative measurement. Less narrowly, since the major emphasis of *Theater Interaktiv* is the teaching of grammar in the context of literature, it seemed sensible to test the usefulness of the approach.

1.1 Subjects

Subjects consisted of three groups of advanced students of German at two different universities.

Group 1 consisted of 19 subjects, 14 female and 5 male, ranging in age from 19 to 30. This group was generally very familiar with computers, with all but one owning, or having ready access to, a computer at their place of residence. Most were regular users, making use of their computer for more than 2 hours a week, mainly for word processing, email and accessing the Internet. Nine used the computer for a number of hours daily.

Group 2 consisted of eight teachers of German who were doing a re-fresher/enrichment course. They were included in the study to provide a different perspective from that of undergraduate students. There were six females and two males, ranging in age from 26 to 49. This group was not as familiar with computers, with one student not using a computer at all, three using it for less than two hours per week, and the other four using it for between 2 and 5 hours per week. The main uses were word-processing, accessing the Internet and using educational software such as encyclopaedias, dictionaries and tutorial type software.

Group 3 also consisted of third year undergraduates, but at a different campus. The ten students were all female and were generally younger with ages ranging from 19 to 28 with the exception of one who was 63 (7 of the group were 21 years old or less). All but one owned, or had ready access to, a computer. Most used the computer almost daily for word-processing. Very few in the group used the computer for other purposes and only two accessed the Internet.

The three groups were approximately comparable in their level of competence in the target language. The same research assistant collected the data in all the groups. Groups one and two were taught by the same teacher at Monash University, while Group three was taught by a different teacher at the University of Western Australia. Care was taken to standardise as many elements as possible across all groups, including the method of teaching.

1.2 Procedure

Theater Interaktiv was integrated into the curriculum of the courses in which the three groups of students were enrolled. The text *Heldenplatz*, on which all the activities in the CD-ROM were based, formed part of their regular third-year syllabus for a four week period. Literature classes were given as usual by the regular lecturer who dealt with the content and the meaning of the play in line with students' usual experience in literature classes in Australian universities. What was different in this project was that the content of all eight language classes during this period was also based on the play. Rather than teaching in isolation aspects of grammar — the two subjunctives and adjective endings — that Australian students of German find difficult, an attempt was made to teach the material in context in a meaningful setting. *Heldenplatz* was chosen because it was particularly interesting, highly controversial and especially suitable for teaching these aspects of grammar.

Before teaching began, each group was given a pre-test on the three areas of grammar to be taught. This test was not returned to the students or ever discussed. Teaching consisted of four 50 minute literature lectures and eight hours of grammar teaching delivered in four two-hour sessions. Each of these sessions included a 30 to 45 minute period of classroom instruction by a highly competent language teacher using communicative methods. The rest of the session took place in the computer laboratory where the students used the *Theater Interaktiv* program in any way they wanted to. The teacher and the research assistant were present at these sessions to answer any questions. All students were encouraged to come to the computer laboratory as often as they wished in their own time to use the program.

1.3 Data Collection

Several methods of data collection were used.

1. *Pre- and post-test*. Before teaching began, all subjects were given a test on the three areas of grammar covered by the program. At the completion of the period of instruction, the same test was again administered as a post-test. The questions were a subset of those used as exercises on the CD-ROM program. Since these included several hundred sentences, the chances of students' remembering them were low.
2. *Questionnaire*. At the end of the period of instruction, students were asked to complete a questionnaire (available by email from the author). This was designed to find out how students reacted to the program in general, as well as to specific aspects of the program.
3. *Observation*. During the four computer sessions, students were observed by the research assistant to determine their degree of interest and engagement, their methods

of working with the program and their reactions to the various components that make up the program. A number of subjects were videotaped while undergoing these interviews.

4. *Journals*. Students were asked to record for each session which parts of the program they worked with, how effective these were as a learning aid, what was good or bad about the facilities they used, and any general comments they wished to make.

2. Results

2.1 Interest

Interest in *Theater Interaktiv* was very high. This was demonstrated in many ways. Observation during computer laboratory sessions showed a high degree of engagement by most students during all sessions. Exclamations of delight, amusement and approval were heard several times:

Student A: This is hard, this part.

Student B: Yeah, but it's fun.

(A dialogue then took place in German between them to find information to help with the exercises)

Comments at the end of the questionnaire were mostly very positive as the following representative sample shows:

- *Overall a most helpful course – has been a great help for my grammar – actually inspired me to learn some.*
- *Great fun. I looked forward to coming to German classes and learnt a lot of grammar – loved to be able to test myself.*
- *Overall, TI has been fun and informative.*
- *I am actually starting to look forward to grammar classes.*

In the questionnaire, subjects were asked to rate their interest in the program on a six point scale. As can be seen in Table 1, interest was very high with almost 67% of students giving it a rating of 5 or higher. There was a significant difference between the three groups. Group 2 (the practising teachers) showed by far the most interest with 100% of respondents rating it 5 or greater (one student failed to give a response to this question) and 57% giving it a 6. This is in contrast with the other two groups where the top rating was given by only 10 and 16 percent

of the students in each group. The reason for this result might have been that practising teachers are generally more interested in innovative teaching materials and tend to spend more time on evaluating such materials than students.

Table 1: Interest in *Theater Interaktiv*

Rating	Group 1 n = 19		Group 2 n = 7		Group 3 n = 10		Whole Group n = 36	
	N ^o	%	N ^o	%	N ^o	%	N ^o	%
1 Very Boring	1	5.3	0	0	0	0	1	2.8
2 Boring	1	5.3	0	0	0	0	1	2.8
3 Rather Boring	1	5.3	0	0	0	0	1	2.8
4 Rather interesting	4	21.1	0	0	5	50.0	9	25.0
5 Interesting	9	47.4	3	42.9	4	40.0	16	44.4
6 Very Interesting	3	15.8	4	57.1	1	10.0	8	22.2

Group 3's responses to the questionnaire indicated the least interest. This confirmed the impression gained during observation. This group showed very little animation or curiosity generally. Unlike most students in the other groups, these students did not explore the facilities available in the program. With one exception, they remained completely focussed for the entire hour and a half on the language exercises relating to the point of grammar that was the subject of that day's teaching. Interviews showed that the perception among most of them was that the best way to learn grammar was to do lots of repetitive exercises, and that playing language games was something to be done only after the 'real' work was completed:

- *Well, I think for me personally, that I need to finish the whole 45 exercises before I'd go and play a game,*
- *Well, I try to get down to the exercises that we're doing, like doing the subjunctive, doing the adjective endings, because that's.... I really need that help in grammar*
- *And because it's a class and we're just trained into believing you've got to do the exercises, we can't play games even though they may be beneficial*

A few students were, in fact, very resistant, with the resistance being based on a belief that computers should not be used to replace teachers. In terms of this program, this resistance was irrational because it had been clearly explained at the beginning of the study that *Theater*

Interaktiv was to be used to supplement classroom teaching, and that a teacher would be present at all scheduled computer laboratory sessions to help with any difficulties the students might encounter.

2.2 Enjoyment

When asked to indicate the three most enjoyable components of the program, exercises, games and videos were clearly the most popular (Table 2). Although exercises were included in the top three by 83.7% of students and games by 78.3%, games were a clear favourite with 40.5% of students ranking them as the most enjoyable component as opposed to videos and exercises which were each ranked first by less than 30% of students.

Table 2: Enjoyment

How enjoyable	Percentage of students who rated components as most enjoyable.				
	Video	Games	Exercises	Tutorials	Culture
Most	29.7	40.5	24.3	10.8	16.2
2 nd	18.9	16.2	45.9	37.8	24.3
3rd.	29.7	21.6	13.5	10.8	27.0
TOTAL	78.3	78.3	83.7	59.4	67.5

One student in a videotaped interview explained the popularity of games in the following way:

It's the same problem as exercises in a book where you've got 70 different things that you have to write out again and again and again. It's like that repetition thing, but you never do it because it's boring. But if it's on a computer, and it's a game, then it's fun and you do it and you learn from it because you're repeating it over and over again.

Games also featured in comments on the questionnaire – for example:

- *The games are fun, not that easy, but enjoyable.*
- *Variety and fun of games is good – makes it enjoyable.*
- *The games give an opportunity to break away from the “classroom exercises”.*

2.3 Enjoyment and effectiveness

The students' perception of what was effective was interesting. They did not equate enjoyment with effectiveness. In fact, it was rare for a student to rate a component that they considered very enjoyable as being equally effective. Table 3 shows a comparison of the components of the program that students rated as most effective and as most enjoyable. One striking fact is that while 40.5% of students rated games as the most enjoyable component, only 18.9% rated them as the most effective. And while only 24.3% of students rated exercises as the most enjoyable, 48.6% rated them as the most effective. It is also worth noting that the exercises were the only component of the program that was rated in the top three by almost 100% of the students. The reason for this could be that they suspected that it was the grammar component of the course that was going to be tested, and so perceived this component as the most important one. In addition, as stated previously, the common perception among most of the students was that the best way to learn grammar was to do lots of repetitive exercises.

Table 3: Enjoyment and effectiveness

<i>Enjoyable /effective</i>	Percentage of students who rated components as most effective (left) and most enjoyable (right)									
	Video		Games		Exercises		Tutorials		Culture	
Most	16.2	29.7	18.9	40.5	48.6	24.3	21.6	10.8	16.2	16.2
2 nd	32.4	18.9	37.8	16.2	13.5	45.9	35.1	37.8	37.8	24.3
3 rd	18.9	29.7	8.1	21.6	35.1	13.5	18.9	10.8	16.2	27.0
TOTAL	67.5	78.3	64.8	78.3	97.2	83.7	75.6	59.4	70.2	67.5

2.4 Effectiveness

Pre- and post-test results. A more quantitative measure of effectiveness was students' performance on the post-test as compared to their performance on the pre-test. Students were tested on adjective endings, subjunctive I and subjunctive II. The number of errors made during each test were counted and a t-test for paired samples was carried out on the results of the pre- and post-test. As can be seen from Table 4, improvement in all areas was highly significant. In the absence of a control group, these results cannot be generalised to any extent, but they do suggest that students participating in this study were not in any way disadvantaged

in the acquisition of relevant grammar, despite having less formal instruction than usual. The teachers involved in the study, both highly experienced at this level, felt that the performance on the post-test was much higher than normally expected for third year cohorts. This appears to suggest that teaching language structures implicitly through the context of literature may indeed be a useful strategy. This view is confirmed by the students' comments (see examples following Table 5 below).

Table 4: Mean Error Rates and t-value for Pre- and Post-tests (standard deviation in parentheses)

Test Type	Pre-test Mean & Std Dev	Post-test Mean & Std Dev	Pre-post effect t-value	p
Adjectives (n=37)	8.67 (2.84)	4.54 (2.60)	9.18	0.002
Subjunctive I (n=37)	5.81 (2.27)	3.02 (1.88)	7.44	0.011
Subjunctive II (n=37)	8.57 (4.87)	2.95 (3.06)	7.27	0.025
Total all tests (n=37)	23.05 (8.21)	10.51 (5.79)	10.92	0.000

2.5 Correlation between Interest and Effectiveness

Pearson correlations were calculated to determine if a student's percentage improvement on the tests was influenced by their interest in *Theater Interaktiv* generally, their interest in the exercises, or the number of exercises completed. No correlation could be established for any of these.

2.6 Grammar in the context of literature

A key aspect of *Theater Interaktiv* was the contextualisation of language exercises in a controversial theatre text. Students were asked to indicate whether they found this approach more or less effective than conventional teaching. Well over 60% of students found the contextualised method more effective for learning both grammar and literature (Table 5).

Table 5: Effectiveness of teaching grammar in literature context

How Effective	Percentage of students rating this approach as more or less effective than conventional teaching for grammar items, punctuation, vocabulary and meaning.				
	Subjunctive	Adjectives	Punctuation	Vocabulary	Meaning
Much less effective	5.4	5.4	5.7	5.7	5.9
Somewhat less effective	2.7	5.4	11.4	2.9	2.9
Less effective	10.8	13.5	20.0	11.4	20.6
More effective	32.4	29.7	34.3	34.3	29.4
Somewhat more effective	43.2	43.2	22.9	28.6	26.5
Much more effective	5.4	2.7	5.7	17.1	14.7

Some positive comments on this were also made in the questionnaire.

- *A very good idea to study grammar of texts studied in Lit – makes both subjects worthwhile.*
- *The collection of exercises drawn from the play is an excellent idea. I much prefer this approach to a set of exercises based on a set of unrelated sentences.*
- *The idea of basing a program on a literary work is excellent*
- *Using literature to teach grammar is a very helpful learning procedure.*
- *I never knew I could learn so much from one single play!*

2.7 Stand-alone Use

Theater Interaktiv was designed to be used in conjunction with good classroom teaching and was not really meant for stand-alone use. Students were asked to give their opinion on the best way to use the program (a) completely stand-alone, (b) after brief class instruction, or (c) without instruction but with the teacher on hand to answer questions.

All but two students agreed that the program should not be used stand-alone. 73.5% supported the program designer's view that the program should be used after brief class instruction to

complement normal teaching. Many commented on the fact that the presence of a teacher during the computer sessions was valuable:

- *The presence of an expert tutor with whom I can discuss problems is very much appreciated. The exercises would be less valuable if such a person were not present.*
- *Need tutor there for questions etc.*
- *It was good to have U[schi] and N[ina] answer my many questions!*

3. Discussion

The multimedia package evaluated here was put together by a team of programmers and language specialists and was carefully designed to be an extensive, integrated resource with a large variety of materials related to the play being taught. These included games to build vocabulary and animated grammar tutorials, in addition to the text and background material. The intention was to provide students with a wide range of resources to access, and a correspondingly wide range of language exercises.

The focus of the evaluation was on the students' perception of the usefulness of such a resource for the study of advanced German within their regular learning environment.

What MacWhinney (1995) calls the 'smile coefficient' was very high for this package. The students were overwhelmingly positive in their responses, even though three found the approach boring and were strongly resistant to it. The greatest enthusiasm was displayed by the group of teachers, who were interested in its potential to contribute to their teaching practice. Particularly gratifying for the designers of the package was the clear statement that the basic approach of integrating grammar into the study of a literary text was appreciated by the students.

Given the variety of exercises provided, it was disappointing that the students, while using other parts of the package and notably the games and the videos, concentrated most heavily on grammar and the rather traditional language exercises.

We might wonder why this should have been so. There is evidence that students focussed on those aspects of the package that they saw as directed to a precise learning goal and as having well-defined outcomes. They may also have focussed on what they believed was likely to be tested. They were not, in fact, informed that there would be a post-test, nor that it would take

the form of grammar questions, but the example of the pre-test was there to suggest that this was the critical area for evaluation.

This raises a question about the chosen methods of evaluation. One consideration in selecting the grammar exercises as the content of the pre- and post-test was that improvement in this area is easily measurable, but, ideally a package which offers a wide variety of activities should provide a correspondingly wide form of testing, however difficult this may be to achieve in all areas. It would have been interesting, for example, to see how the students reacted to the word-based games – the basic source of vocabulary enrichment in the package – if vocabulary had been tested instead of grammar.

As the data show, the students did not regard what they found most enjoyable as most effective, or *vice versa*. They are not necessarily the best judges of this and further detailed tests need to be conducted to explore the issue, but it is interesting that they thought the games most enjoyable and the grammar exercises most effective. The data gathered from their observations and journals suggest some possible explanations. Grammar tends to be the most frequently tested part of traditional language courses anyway; students may tend to regard the acquisition of grammar as one of the most difficult and important elements in language learning; and the use of computers for drill and practice exercises in the past may have given students the impression that this is what computers are best at.

Even apart from the fact that grammar was tested in the evaluation, therefore, there may be reasons to think that students would anyway have spent a great deal of time on grammar exercises, especially since they contained the most difficult aspects of advanced German which cause problems to even third year students. The very positive result of the post-test on the grammar exercises should be seen in this context. While it is impossible to generalise conclusions from these results in the absence of a control group, students' comments appear to suggest that the opportunity to practise difficult grammar was greatly appreciated. Students particularly enjoyed the instant feedback, the non-threatening environment and the context-based exercises. "Bernhard's sentences are so much more interesting than the ones in our grammar books" was a frequent comment during the observations.

An excellent aspect of the evaluation was the variety of data collection techniques used, and this approach is highly recommended for future research. Questionnaire, journal and test data complemented the information collected during the observations. These latter, in particular, yielded interesting information that would have been difficult to obtain through questionnaires.

They clearly confirmed the general enthusiasm for the approach. They also highlighted differences of learning styles and preferences among students, as exemplified in one who, without being antipathetic to the approach, expressed a preference for paper-based over screen-based learning.

A number of students made the point that they particularly appreciated the advanced level of the program and the fact that all instructions and help screens were in German. 'It's nice to see that the computer recognises that we already know a lot of German'. This was particularly encouraging to the designers since there had been some worry about the exclusive use of German in what was a pioneering and complex program. The fact that no English was used may have contributed to the fact that interaction between students was carried out largely in German, even on technical matters relating to the computers.

The assumption of the designers was that the software would be incorporated into classroom teaching, but its usefulness and effectiveness in stand-alone mode, where it would replace teachers rather than supplement them, needs to be tested. The students' preference for using the software as part of a learning environment that includes the teacher may be understandable simply in terms of the perceived ideal being preferred to any alternative, however good such an alternative might prove in practice. After all, during the observations, many commented on the fact that one of the benefits of using a computer was the possibility of working at one's own pace and in one's own time. It would be interesting to see whether an equivalent evaluation with a comparable group of students working entirely alone with the program would yield significantly different results. A study of Web-based language learning currently being undertaken by the author may throw some light on this question.

In conclusion, this was a difficult evaluation to carry out and perhaps one that was over-ambitious for the time available. A recommendation for further research of this nature is either to concentrate on fewer variables to be investigated, or to opt for a longer time frame.

Despite the limitations of the present investigation, however, some tentative conclusions can be reported. The study showed that students were generally enthusiastic about using this multimedia program as a resource for advanced language learning. They particularly appreciated the contextualised approach and the non-threatening nature of the activities and environment. While they enjoyed the games best, they thought the grammar exercises the most effective element of the program, devoting a large part of their time to them and performing extremely well on the grammar tests at the end of the four-week period. Students were almost

unanimous in their belief that the program should be used in conjunction with good classroom teaching, and that the teacher should be available to answer questions and give guidance during computer sessions.

Notes

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Biodata

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