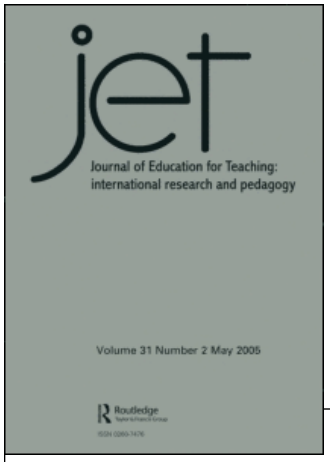

Journal of Education for Teaching
International research and pedagogy
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713430265

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Online Publication Date: 01 August 2008

To cite this Article: Grzega, Joachim and Schöner, Marion (2008) 'The didactic model **LdL** (Lernen durch Lehren) as a way of preparing students for communication in a knowledge society', Journal of Education for Teaching, 34:3, 167 — 175

To link to this article: DOI: 10.1080/02607470802212157
URL: http://dx.doi.org/10.1080/02607470802212157

Journal of Education for Teaching
Vol. 34, No. 3, August 2008, 167–175

The didactic model *LdL* (Lernen durch Lehren) as a way of preparing students for communication in a knowledge society

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(Received 8 October 2007; final revision received 3 March 2008)

Based on studies in learning psychology, biology and education, the original technique *Lernen durch Lehren* (*LdL*) (German for '*learning by teaching*') has been elaborated into a meta-model *(Meta) LdL* that aims at giving students a platform to acquire the competencies considered necessary for knowledge societies. Ninety-seven former students of university classes modelled on *(Meta) LdL* participated in a questionnaire to determine the effectiveness and efficiency of *(Meta) LdL*. A majority of participants attested *LdL* to have allowed for a gain in all competencies and claimed that no other method they were aware of would be more efficient than *LdL*.

Keywords: educational model; communicative competence; knowledge societies; teaching approach

Introduction. What competencies are needed today and how we fail to achieve them

What are the competencies that people in modern information and knowledge societies need and how do we enable our university students to acquire these competencies? We would like to present the didactic model *Lernen durch Lehren* (*LdL*) (German for 'learning by teaching'), originally designed for and now widespread within secondary schools (particularly, but not exclusively) in Germany, as a model that enables students to acquire these competencies in an effective and efficient way at university level.

If we take into account research on information and (developing) knowledge societies, these societies require from their members a number of qualities, namely:

1. a broad general knowledge with various pieces of expert knowledge;
2. a catalogue of:
    a. personal competencies (e.g. self-discipline, withstanding fuzziness);
    b. social competencies (e.g. communicating empathically in an atmosphere of trust, openness, cooperation and efficiency);
    c. methodological competencies (e.g. drawing attention to oneself, asking questions, finding and evaluating information from various sources, transforming information into applicable knowledge, translating expert knowledge into generally intelligible language, with a focus on communication between human and human and not on communication between human and machine).

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ISSN 0260-7476 print/ISSN 1360-0540 online

DOI: 10.1080/02607470802212157
http://www.informaworld.com

This list of competencies and sub-competencies is based on research by, for example, Bromme, Rambow and Nueckles (2001), Franck (1998), Grzega (2005a), Händeler (2005), Rifkin (2004), Rosenberg (2003), Spiegel (2005) and Von Krogh and Wicki (2002). These declarative and procedural skills will allow people to become temporary specialists for a specific question in a short space of time.

Taking ideas from capability theorists, students and researchers, Walker (2006) suggested the following list of capacities that should be taught at university level and that, in part, intersect with the competencies mentioned here: (a) practical reason; (b) educational resilience (i.e. the ability to navigate work and life); (c) knowledge and imagination; (d) a learning disposition (i.e. the ability to be curious and a desire for learning); (e) social relations and social networks; (f) respect, dignity and recognition; (g) emotional integrity and emotions (i.e. being free from anxiety and fear, but being able to show imagination and empathy); (g) bodily integrity (i.e. safety and freedom from all forms of physical and verbal harassment).

If we want to provide our students with the necessary equipment for a successful life in information and knowledge societies we first have to determine what the necessary ingredients for effective learning are according to studies from learning psychology, biology and education. The following list of ingredients for effective learning can be drawn from research by, for example, Csikszentmihalyi (1990), Frankl (1946), Maslow (1954), Hunfeld (2004), Lakoff and Johnson (1999), Ryan and Deci (2000), Spitzer (2002), Teuchert-Noodt et al. (2003):

- the possibility for self-fulfilment;
- affective attachment to learning matters;
- the experience of flow effects;
- an active exposure to learning matters ('grasping' their meaning);
- the presentation of learning matters in a familiar 'language' (in a familiar register);
- the presentation of learning matters through intelligible metaphors and analogies;
- autonomy in topic selection, with a recurrent scrutiny of knowledge;
- learning in a community.

Taking these fundamental observations into account, it is astonishing that the teaching method still most used in universities worldwide is the lecture (cf. McKeachie 1999, 66; Bligh 2000, 3). The (classical) lecture, however, as has been shown by numerous studies (cf. the overview in Bligh 2000, 3; McKeachie 1999, 66ff.), is only effective in transmitting information for no longer than 20 to 30 minutes (provided this information is not available as such in printed form), while lecturing is ineffective in promoting any sort of deeper reflection (including self-reflection), activity or creativity. For these latter aspects the didactic model *LdL* would appear a useful alternative, whilst at the same time not denying that there may also be other ways of effective and efficient preparation for information and knowledge societies.

The didactic model *LdL* – a brief overview

LdL was invented by Jean-Pol Martin in the early 1980s to teach foreign languages in schools, as a reaction to the absence of grammar after the 1970s' communicative turn in foreign language teaching (which focussed fully on communicative skills), on the

one hand, and the absence of communicative competence with behaviouristic methods, on the other. The methodological core idea is to have a pair or group of students instruct the majority of topics (selected by the teacher or by the students themselves) to their classmates, but in a way that activates their classmates' participation and communication in the best possible way (Grzega 2005b, 2006; Martin 1985). It is not the student experts' task to just present an issue in a linear manner, but to think about ways that will have their classmates find the answers to questions and thus only gradually reach a structured knowledge at the end (in Martin's words: 'linearity a posteriori').

In this way learners are given the chance to acquire creativity, independence, self-confidence and key competencies, such as the ability to work in teams, the ability to communicate, complex thinking, the competence to seek and find information, explorative behaviour, presentation skills, project competence, Internet skills, the ability to structure information and generate knowledge, punctuality, reliability and patience. The role of the teacher is one of pre-selecting or suggesting topics, giving guidelines to the student experts regarding didactic possibilities and the relevance of content, assisting student experts during preparation and in class, observing the learning process reflected by the actions and reactions in class, and guaranteeing that, despite potential problems, every learner will at the end know what the main insights or conclusions of the lesson were supposed to be. The teacher and students are conceived as partners, the hierarchy is flat and there are evaluation phases in the middle of the course, well before the end of school year.

After his first successes Martin elaborated his technique into an overall model, or 'hyper-method' (Martin 1994, 1999, 2002). There has been critical acclaim of the method in the mass media (see Kahl 2004, 2005; Thimm 2002, particularly 71–5), including TV reports (http://www.ldl.de). *LdL* was then also applied in language courses at university level (Oebel 2005; Pfeiffer and Rusam 1992; Skinner 1994). Martin made his research transparent to the general public via his website (http://www.ldl.de).

Since the late 1990s *LdL* has been further elaborated, refined and used in linguistics classes in various universities, for groups of six to groups of 65, by Grzega (2005b) in order to show that the model also works in classes where highly academic approaches were to the fore. Through dialogue (or rather 'polylogue') ideas, in the form of theses and antitheses, lead to syntheses through which learners can improve their abilities to structure, link and expand their cognitive maps. Preferably, learners should be activated (at least for a large part of the course) in order to activate as many of their synapses as possible. The idea is that it is only if students virtually 'grasp' a problem that they can then cognitively grasp it and understand it.

For all innovatory developments in the *LdL* model since its introduction into universities the two central questions have been:

1. what competencies are required from successful members of knowledge societies;
2. what are the most efficient ways to enable (the vast mass and very consciously not just the elite of) learners to acquire these competencies?

The competencies demanded by people outside academia have been identified above. As a consequence, three supports have been developed as vital in Grzega's linguistics classes:

i. teaching core knowledge;
ii. teaching key qualifications and methodological competencies ('soft skills,' including the skill of translating information into knowledge and the skill of presenting knowledge in a way that is intelligible to the general public);
iii. encouraging students to delve more thoroughly into specialized topics and to carry out their own research with the instructor's assistance (e.g. via the Internet).

Furthermore, *LdL* classes do not follow a narrowly preset scheme, but require action research, understood as being a process whereby the researcher (here the instructor) and the 'research subjects' (here the students) try to solve a problem directly when it occurs in reality (Lewin 1946).

The linguistics classes led by Grzega and his doctoral candidate Marion Schöner have been of various types: some dealt with historical, some with synchronic issues, some were related to English, some to other European languages, some to language in general, while some had to be completed by a written exam, some by a seminar paper. Over the years the possibilities that the Internet offers have been included more and more (from putting material online to discussing tasks on a forum to carrying out research projects on a *wiki*).

Most recently *LdL* has also been tested out in seminars of technical disciplines at several German universities of applied sciences and in a seminar on applying for a job. Instructors were first trained in *LdL* in one or two workshops (organized by Franz Waldherr, Joachim Grzega and Jean-Pol Martin). From the discussions in these workshops guideline articles evolved (Grzega 2005b, 2006; Grzega and Waldherr 2007). *LdL* classes are constantly being 'updated' and refined within the *LdL* grid of principles using the literature cited in these articles as well as continuing experience and discussions. In order to differentiate between the technique and the overall model the latter will be termed *MetaLdL*. It is now desirable to empirically test *(Meta)LdL* to see whether it succeeds in preparing students for information and knowledge societies.

LdL classes as a preparation for life in information and knowledge societies

Since *(Meta)LdL* classes cannot be fully pre-structured and since *(Meta)LdL* classes are by definition dependent on the learner group and since *LdL* pursues many goals that are not the goals of more traditional didactic models and not the goals of current final examination types, contrastive empirical studies do not seem to make much sense. Evaluation papers in the universities where *(Meta)LdL* has been systematically used illustrate the same problem: they don't relate to many of the goals of *(Meta)LdL*. We have therefore designed a specific questionnaire in order to determine the effect and efficiency of *(Meta)LdL* classes with respect to their meta-goals, i.e. the preparation of students for a future life inside and/or outside academia. A sample questionnaire as well as a raw set of answers (both in German) can be obtained from the authors.

The first section of the questionnaire, using a four-point Likert scale, consists of statements on goals and didactic methods, which informants comment on by ticking one of the statements 'I fully agree' (1), 'I slightly agree' (2), 'I slightly disagree' (3), 'I fully disagree' (4). The goals, formulated as statements, are related to 11 competencies fundamental to information and knowledge societies plus a twelfth competence related to the study programme, as well as to the question of whether the competencies are relevant outside academic life. In the second section of the

questionnaire the realization of a goal was directly linked to each didactic method (of the type 'Goal X was achieved because method Y was used') and we asked informants to indicate for each combination whether they thought that this combination was a good description of the effects of the *(Meta)LdL* class. Finally, we asked informants to state whether other techniques might have been more efficient in the achievement of single aims.

The questionnaire was placed online, and an e-mail sent to all students who, within the previous three years, had taken *(Meta)LdL* classes by Jean-Pol Martin (on European history, French literature, the Internet and project competence) and Joachim Grzega and Marion Schöner (on various linguistic topics), requesting students to retrospectively evaluate the benefits of the *LdL* system. Ninety-seven persons completed the questionnaire, which consisted of 54 items. Martin's courses were evaluated five times, Grzega's courses 69 times and Schöner's courses 23 times.

The effect of LdL

After the first two statements on the title and date of the course (items 1 and 2) there is a first section on the effect of *(Meta)LdL* (statements 3–15) with respect to its goals (a statement is confirmed when the mean is less than 2.5 and the median is 1 or 2). The goals, formulated as statements, are related to 11 competencies fundamental to information and knowledge societies plus a twelfth competence related to the study programme, as well as to the question of whether the competencies are relevant outside academic life.

In summary, the majority of the informants evaluated the *(Meta)LdL* classes as effective with respect to the acquisition of competencies required in information and knowledge societies. This includes those goals that specifically address the communicative competencies vital in knowledge societies (statements 2, 4–6 and 8).

The next statements in the questionnaire asked the informants which of the techniques in the *(Meta)LdL* model they saw applied in the *(Meta)LdL* classes. The detailed results are not vital to the main point of the paper (which can be obtained from the authors), however, they show that the informants considered the following principles as particularly supportive of the acquisition of the competencies listed in Table 1:

- the transfer of knowledge was in a language that was 'close to students';
- there was high communicative activity by all class participants;
- there was a high degree of teamwork;
- there was a very high level of active 'discovering' and 'grasping' the content of the lesson;
- there was a high level of transfer tasks in comparison with recitation tasks.

In the next section of the questionnaire we set out to find out whether the completion of certain goals was seen as particularly linked to certain ways of thinking/teaching. Each of the statements was tied to the list of methods or reasons just mentioned. The results were not significant, although they can be obtained from the authors on demand.

The efficiency of LdL in comparison with other methods

In the final section of the questionnaire we asked for the informants' view on whether any other ways might have been useful to achieve each goal. After answer (a) 'Don't know', we suggested a list of alternative techniques:

Table 1. Learners' achievement of the *LdL* goals.

Statement	Mean	Median
1. I have acquired new expert knowledge that I could also combine with already acquired knowledge to get a new overall perspective.	1.69	2
2. I can now impart my knowledge to other people in a better way.	2.19	2
3. I now come up with questions on a topic more quickly.	2.13	2
4. I am now able to formulate questions to others in a more intelligible way.	2.22	2
5. I am now able to give well-founded answers on questions more rapidly.	2.12	2
6. I am now more able to work in a team.	2.13	2
7. I am now more able to provide myself quickly with information.	2.19	2
8. It is now more easy for me to estimate the value of information for a specific question.	2.16	2
9. I have acquired competencies that are also useful for me in other walks of life.	1.88	2
10. I now venture in unknown domains more easily.	2.01	2
11. I now venture in unknown situations more easily.	2.26	2
12. I am now more able to make complex situations and problems manageable.	2.14	2
13. I feel well prepared for the rest of my studies at university.	2.04	2

(b) a classical lecture by the instructor;
(c) a modern 'edutainment' lecture by the instructor;
(d) a course of half lectures, half exercises led by the instructor;
(e) talks by students with subsequent instructor comments;
(f) talks by students with subsequent exercises led by the instructor;
(g) a course of half lectures by the instructor and half exercises led by students;
(h) individual work instead of teamwork;
(i) alternating techniques, but with all sequences moderated by the instructor;
(j) less classroom phases and more project work outside the classroom with instructor monitoring.

Listing those techniques that were seen as most efficient for each goal by more than 25% of the informants that commented on a specific statement we obtain the picture shown in Tables 2 and 3.

Quite a number of students saw a more instructor-centred method as a possible alternative method for gaining and connecting knowledge.

All in all, however, it is remarkable that none of the alternative techniques was considered more efficient for any particular goal by a majority of the informants who commented on a specific item.

Conclusion

The aim of this paper was to discover whether the didactic model *LdL*, or *MetaLdL*, enables students to acquire 11 qualities fundamental to information and knowledge societies. It could not, of course, test actual achievement of the competencies, since adequate test designs for the achievement of such competencies do not as yet exist,

Table 2. Potential alternatives to *LdL* (part 1).

The goal in statement…	might be better achieved through technique…	in the opinion of this percentage of the commentators
1 (combining knowledge)	d	44.21
1 (combining knowledge)	g	26.32
1 (combining knowledge)	i	36.84
6 (answering quickly)	j	39.13
13 (venturing into new situations)	g	26.60

and may never do so. Only as regards the 13th competence, related to the study programme and covered by statement 13 ('I feel well prepared for the rest of my studies'), can we feel comfortable with its connection to reality, as all linguistics students who participated in our introductory linguistics class, in one of our *LdL*-led seminars and in the examination preparation course passed the final, centralized, linguistics examination.

However, since many of the competencies may only be apparent well after the end of a seminar we think that the approach of asking students for retrospective judgements on *LdL*-designed courses is a justifiable means of evaluating the quality of *(Meta)LdL*. It could be shown that participants in *(Meta)LdL* classes see the elements of this model as an effective and efficient way of acquiring expert knowledge and communicative competencies, vital for highly interactive information and knowledge societies, such as working in a team, setting up and carrying out a project, gathering information in an efficient way, venturing into new domains and situations and explaining expert knowledge to laypersons. Our informants saw – as

Table 3. Potential alternatives to *LdL* (part 2).

For the goal in statement…	single informants gave as alternatives
1 (combining knowledge)	A more structured course (does the informant mean 'linear'?). A lecture in the sense of a summary for a reading assignment with opportunities for questions. A workshop with just a small number of participants. A better mixture of methods, less time for revisions. *(Meta)LdL*, but with a stronger focus on self-study.
4 (formulating questions)/5 (answering clearly)/9 (skills useful outside academia)	Chalk and talk instruction (as an equal alternative).
5 (answering clearly)/7 (finding information)/9 (skills useful outside academia)	Discussions led by the instructor (as a better alternative).

proven by the last section of the questionnaire – no alternative models or techniques of teaching as surpassing *(Meta)LdL*.

In conclusion, we would argue that *(Meta)LdL* should find broader recognition in university education and suggest its usefulness in didactic experiments in international linguistics classes.

Acknowledgement

We thank Alexander Schöner for his discussions regarding the project and the article.

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