New educational media and textbooks

The 2nd IARTEM Volume

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Introduction

The scene of educational materials as artefacts

Education, teacher training and perspectives on learning have changed all over the world. Perhaps it is accurate to talk about a “Copernican turn” in education. This change in perspectives and practices involves the political economy of education, planning policies, organizational structures and economic grounding. But it is also relevant to talk about a change in terms of the role of the teacher and the role of the pupil/student. The teacher's role will shift from that of an instructor to that of a guide, tutor and facilitator of the learning process. The student will no longer passively listen and make notes but be actively involved in the constructing practices of knowledge processes.

The artefacts we nowadays use in schools have also changed. We do not only use traditional textbooks, maps on the walls, stuffed animals or microscopes, but also new electronic media with texts, pictorial illustrations, built-in laboratory experiments and communication possibilities, and we talk about “distributed learning“, “e-learning“ and computer-supported activities.

These changes will of course influence the conditions for the production and marketing of educational material. Schools will to greater extent meet new actors both in terms of organizations (e.g. software industry) and in terms of authors (journalists, experts other than teachers etc.) who will compete with the old type authors and publishers.

The use of educational material will furthermore to greater extent also involve play (Spiel). We can see this in the so called edutainment programs. The borderline between learning and playing will gradually dissolve, and play will become part of our understanding of learning. To learn is to a very high degree to acquire and use knowledge (cf Wittgenstein), to solve problems and to construct or create models/artefacts/texts/pictorial illustrations etc. as part of the learning process itself.

All these new conditions for knowledge and educational media will also change our expectations of what a textbook “is and what it “ought to be. In this volume we present research on textbooks and educational media, origi-
nally presented at the IARTEM conference in Ütrecht, The Netherlands, in 1999. The conference showed that textbooks are still of great importance, but it also showed the necessity of looking at new media and new forms of distribution of, in a wide sense, educational “texts“.

Stockholm and Enschede

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Part I

New Media as Educational Texts
1. Introduction

Traditionally textbooks are the main planning aid for teachers in planning their daily educational offers.

Three main trends can be observed in society affecting educational planning. First, education should help children to unfold their personal capacities in order to become flexible participants in society. Second, school loses its monopoly in teaching and guiding learning of children. Third, sciences provide schools with detailed insights in learning processes and very precise educational methods. Under pressure of these trends teachers have to make more complex educational decisions.

Educationalists try to improve the planning capacity of schools in several ways, in order to meet the observed trends. Man having bounded rationality, there is a limit in the complexity of educational decisions a teacher can make. There are four main solutions to increase the complexity a school can cope with.

The first solution is to create an organisation in which teachers have restricted tasks: e.g. teaching in a one-age group or teaching one subject area only.

The second solution is to simplify educational decisions: e.g. self-instructing materials where the teacher has to guide the pupils by giving subsequent tasks, or giving students rich learning environments.

The third solution is to give the teachers schoolbooks with a good teacher guide and handbooks (in this text referred to by the word “textbook”)

The fourth solution is the use of information technology in several situations: intelligent learning environments for children, planning support for teachers.
In this contribution I will describe why and how the last group will become the main planning aid for teachers in adaptive planning.

2. Planning load in school is becoming too heavy

*The teacher: able to turn his hand to anything?*

Last century we have seen a large growth of educational sciences. Experts mean the best and like teachers using all available expertise in their classes. Constructivism for example stipulates each man constructing his own knowledge by solving problems. The teacher has to guide students in their personal thinking. He has to understand the different solutions of students, he has to think about the quality of their solutions related to their current knowledge and he has to formulate interventions if necessary.

Detailed task analysis makes clear that for each task a student needs some “critical mass” in order to be able to work fruitful with that task. So teachers have to keep track of learning results by testing and observation.

Combininthe constructivist approach and task analysis approach for optimal planning gives a lot of work.

*Teacher becoming a centipede?*

Government, parents, employers, and further education also want children to be educated in a modern way. Education has to be “open to the needs of society” and has to be organised “with attention for personal capacities”.

Globalisation of the world brings other cultures in our personal world. Cultures from the other side of the world and cultures of other parts in our society can be met in town, by television, during trips and by internet. We meet other ways of living, social structures, religions and intellectual approaches.

Educating students in tolerance, taking responsibility, flexibility and an open mind in a globalised world demands a lot of pedagogical effort of parents and teachers.

Many employers want to be able to reorganise their venture to react flexible on what the market needs. So their employees have to be able to change with the venture or have to be able to find another job. So meta-knowledge is wanted more than specific knowledge, competencies more than specific abilities.
In order to find their places in the labour market students have to practice their best capacities. Parents claim the right for their children to unfold their best capacities in the most productive way. And pedagogues know that unfolding capacities only can be done by becoming and finding yourself and by coping with your roots.

So teachers are required to give children in several perspectives the best possible education. A bit more than teaching reading and writing or teaching history.

**Teachers like to give the best to their students**

Schools and teachers get all kinds of good meant hints and suggestions to improve their educational offer. But sometimes doubt comes quite rightly over a teacher: “How can I realise all that?”

Most teachers are involved with their students. They wish they could give the best to their students and want to prepare them for a good life. I know many teachers working very hard and with a lot of devotion with low gifted children. The more and more pedagogical and medical knowledge comes into school.

Teachers feel they should do something with it. Just like parents, reading pedagogical journals.

So teachers feel themselves sometimes like professional jugglers, and sometimes all wishes are becoming too much. From ideas to practice is often a difficult way. Frustration lies in wait.

3. Towards a better understanding of educational decisions

Before and after, but also during teaching the teacher arranges his educational offer. The more he wants to fit on students activity and the more perspectives he takes in account, the more effort and the more intellectual work is demanded.

The process of educational guidance (scheme 1) can be understood in terms of a teacher who tries to understand his students and who wants to offer education to his students.
This process is a cycle as depicted in scheme 2: (A group of) student(s) is doing anything in school and the teacher observes the student(s)’ work: activity and expressions like spoken language, body language or written text. The teacher decides how to continue and what educational offer he will prepare for the student(s). An educational offer can be a problem, a training task, an intervention, new material, or a hint for better interaction.

The student can do something with it and may produce new actions being a basis for further guidance of the teacher.

Guiding learning processes is a complex task, and therefore teachers may use a textbook as an aid in planning. A textbook is some kind of an educational agenda (scheme 3), offering good sequences of subjects, training and giving (suggestions for) tasks and testing.

From the textbook the teacher can know what is important to concentrate on, what behaviour of children he has to look after and what progress has to be recorded. A teacher might use a textbook as a recipe for lessons. There are circumstances a teacher needs a recipe book, for instance in times of task overload or sickness, or for starting teachers being uncertain about a subject area. A dangerous side of using a schoolbook might be the teacher does not take his personal responsibility for education, blindly following the schoolbook.

In the perspective of planning load a textbook is a good help for the teacher to reduce planning overload, as a result of the three trends observed in the introduction and as a result of the increasing planning load in school (paragraph 2). In this perspective a textbook reduces the planning task of a teacher to those aspects which are appropriate for the role the teacher is working in. This aspect will be discussed in paragraph 3 about school organisation.
**Students are observed and instructed in more detail**

As mentioned in the introduction teachers have to plan their educational offers in a well-tailored way. Therefore they have to observe students in detail and they have to keep records of student progress. Bad learners should be observed in more detail with diagnostic tools as special tasks and tests. Once having an idea of the groups or students abilities, the teacher has to prepare an educational offer. Textbook, literature and colleagues might be consulted. When working with a group in the classroom a teacher does not have the same opportunities for observation, recording, reflection, consulting and planning as after lessons. This is an important observation related to planning load. In the next paragraph different roles of teachers in school will be described in a scheme.

### 4. School organisation in a planning perspective

#### Layers in school organisation

The teacher has his part in several layers in school organisation. Scheme 5 shows three different roles of the teacher as “guide” of processes in school. Starting at the student level the scheme presents one or more students, working in a learning environment. The shadow at the student field expresses there might be more than one student. Students and learning environment together are called the learning system.
Examples of learning systems are:
– a group of students solving a problem;
– a single student doing a task;
– a group of students investigating something in the school library;
– a group of students in an excursion.

In a school day students are participating in subsequent learning systems. Some learning systems do exist an hour, others a morning and some exist only a few minutes. In a classroom learning systems are starting and stopping at different moments and students are changing from stopping systems to other starting systems. Some learning systems stop at a moment and will continue the other day or week. A teacher can guide several learning systems at a time. The more learning systems a teacher has to guide, the more concentration he has to bring up. The teacher guiding a learning system is “instructing”: he tries to influence the learning processes in the learning systems. Therefore this role of the teacher is called the “instructional guidance”.

After lessons or in a silent break the teacher can reflect on long term educational decisions: how a theme has to be programmed, which alternatives he will use in instruction, what level he will demand from children.

In his role of “educational guide” the teacher tries to plan what he will do in his instructional role within for example constraints of aims and goals, the textbook, the composition of the groups and reckoning with the actual learning progress and actual situation in his groups.

The director of school or a teacher meeting may decide about buying materials or text-books, can provide external support, decides about group composition, subject matters, testing methods and goals.  

Scheme 6: Layers in school are open to the environment

In scheme 5 the systems are separated from their environment. That is a bad way of drawing. Scheme 5 has to be understood as nested and open systems: Teachers and students are coming in and going out of these systems, bringing ideas, concepts and skills to and from school, as expressed in scheme 6.
Information flows

The going up and down arrows in scheme 5 and 6 express the information flow between students and the different planning parts of the teacher in the layers of school organisation.

The going up arrows represent information about the underlying system, so that student or teacher can try to follow what’s happening. In all layers of school organisation data of learning environment, individual pupils and groups are recorded, collected and edited for use in educational decisions and for internal and external communication.

Educational decisions are made in each layer in school organisation, having impact on deeper system layers in the organisation. Educational decisions may be based on information about the underlying system, guidelines from overlying systems and actual influences from outside the system. Educational decisions result in guidelines, resources and data for deeper layers. They not only affect the activities of students but also the activities of teachers and groups.

The going down arrows represent the influence exercised by guiding systems or the students. Mostly they will not determine the behaviour of underlying systems.

There is a substantial educational information flow in school. This flow is more intensive and planning tasks are more complex and demand more concentration and energy of teachers, when school wants to give more attention to specific needs of groups and individuals and want to do more with the actual situation in a group.

Teachers are not used to use and to produce information from and for others. In former days a teacher was a king in his classroom and did not have to co-operate with colleagues. Rules of the director were not very complicated and did not affect the teaching process in the classroom very deep.

Structuring school in rather independent classes is the first solution we met above in the introduction to cope the complexity of education. Creating independent classes simplifies the planning in the school layer. Imagine the case a school has flexible classes, with children changing during a day from one group into another and imagine the co-ordination tasks coming forward from that.

Within the classroom we see a similar partition in subject areas. That is a very drastic simplification of the teachers’ work as an educational guide. Mutual excluding subject areas demand less co-ordination than working in e.g. themes.

In a lesson the teacher can organise independent learning systems: e.g. students doing individual tasks.
In general partition in independent units seems to reduce co-ordination load. But it has its price: partitioned education does not meet the general ideas about good education as discussed in the paragraphs 1 and 2. There are other possible solutions for more adaptive planning.

**In all layers teachers may plan adaptively**

Scheme 7 presents a combination of the schemes 1 and 5. In each level of the organisation the guiding teacher can make educational decisions using information from the underlying system. This is represented by the decision cycle of scheme 1.

*Scheme 7: adaptive planning in school*

In each level some usual solutions for adaptive decision making are given. Because the decision cycle is general for educational decision-making we introduce the general concept of GS-DS combinations.

**GS - DS combinations**

Education is usually perceived as “a student or a group of students is learning in a guided situation”. The one who guides decides about a number of constraints, trying to influence the developing process of the students. From the perspective of decision-making
I propose scheme 8: any guide (guiding system GS) decides which tasks (or any intervention) should be given to someone (or a group) who is developing (unfolding) himself. This person or group will be called a “developing system”. The guide tries to find out what is the state of developing system and how is the history of the persons in the DS. That information is basis for further decisions in the GS.

A “Guiding System“ (GS) tries to get acquainted with the “Developing System“ (DS) by observing its behaviour and achievements as good as possible. The GS guides the DS by tasks and instructions.

The word “system” in “Guiding System” and “Developing System” is used because it is not always a teacher student relation we are talking about. In a GS there might be a group of teachers, or a teacher and his planning aids (scheme 4), or a more experienced student. A DS might be a group, or a single student, working with materials and computers. A GS can contain also data, information media and consultation opportunities.

A GS can be a single group teacher and scheme 8 can be read as: The teacher tries to become acquainted with a student by interpreting the “student’s work“ as good as possible. He tries to anticipate on and to guide the pupil’s development by choosing well fitting educational offers.

In the same way scheme 8 can be read as a school director trying to coach his team and the groups in school.

So a GS can be a director, a section head or a teacher and a DS can be a teacher and his group, a group or an individual pupil.

5. Generative planning and generic curricula

The word “curriculum” refers to the idea students have to go a certain path to attain certain some knowledge and skills. The word “curriculum” is referring to “sequencing subjects” too. Sequencing subjects has to do with the experience students had better to be acquainted with the basics of a
more complex task, before that task is offered. To be acquainted with is not equivalent with “mastering”. Mastering a subject could be understood as context independent, where acquainted with could be understood as more local.

This difference is important in sequencing a curriculum. Many times there is no automatic transfer from one context to another: a subject might be mastered within a certain context, and should therefore resumed in a later stage in other contexts.

In schoolbooks some of this resuming is done by the authors: so the teacher may trust if he offers page 78 the basics for that page are mastered enough. Unfortunately this hypothesis becomes not always true. Many times students will master subjects just enough in the context of a certain task. So they have hidden lacks in mastering, leading to problems later on.

In this context it is good to make a difference between a curriculum as the line of educational offers (teaching) the teacher (with his textbook) creates, and the lines of learning and development the individual students follow. We could say: There is a teacher curriculum and there are student curricula. In the case of using a schoolbook the teacher curriculum guides most student curricula in a proper way. The teacher curriculum is not exactly the curriculum as proposed by the schoolbook, because the teacher makes a number of differentiating decisions.

We could imagine another type of curriculum: knowing what students are already able to, the teacher might decide what tasks the student seems to be able to: some kind of zone of next development. From those tasks he can make his choice how to continue. The subsequent choices should be made in such way that in the end final goals are reached. In this type of planning there is no predefined curriculum. A student curriculum comes into existence as a result of what the teacher knows about his students, the educational alternatives the teacher has and the constraints and goals of the school.

I propose the terms “generative planning” and “generic curriculum” as names for this second kind of curricula (Scheme 9). Generative (like generative grammar) because the planning is decision-rule-driven, not based on a predefined curriculum. Generic because only the type and goals of the curriculum are known and the way it comes into existence. The sequence of subjects is not known before.
Generative planning:
Flexible and adaptive planning in guiding systems

A student curriculum comes into existence in function of:
  - Educational constraints
  - Available educational alternatives
  - An overview of what the student is able to

Scheme 9: Generative planning
Where the teacher curricula are based on predefined less or more linear sequences, the generic curricula are not predefined and if necessary depending on the actual situation of students and teacher and his decisions. Generic curricula may differ in their set of decision rules. The traditional teacher curriculum can be seen as a generic curriculum with very restricted decision rules: a little use of student data and very little influence of the actual situation. In fact developments in the learning environment don’t have much impact on the teachers’ decisions in the higher layers in school (scheme 5).

The more heterogeneous the groups of students and the more education has to be made fitting to certain circumstances (scheme 6), the more teachers will need generative planning.

Resuming scheme 1 and scheme 6, we can see: A GS (guiding system) tries to know a DS (developing system) by observing its behaviour. The GS might make an imagination of “what the DS is able to” from the actual behaviour (reports) of the DS and the recollections of earlier behaviour of the DS recorded in the GS. In a generative planning style the GS decides about a next educational offer, based on available alternatives, constraints and overview (model) of the DS.

Scheme 9: Generative planning in GS-DS combinations: Data needed by a GS to define a next educational offer

<table>
<thead>
<tr>
<th>Educational constraints for GS and DS.</th>
<th>Educational alternatives available for GS and DS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offer / Task</td>
<td>An overview (a model) of what a DS is able to.</td>
</tr>
</tbody>
</table>
Educational decisions

In scheme 9 we have a global understanding of educational decisions. A GS tries to understand a DS and tries to influence its development by offers and tasks. The GS makes decisions. In many of the schools in the Netherlands these decisions are based on a linear teacher-curriculum, in which overview, alternatives and constraints are mixed and prepared. In e.g. Petersen schools (Jenaplan), Montessori schools and other reform schools teachers try to do generative planning, but that gives a lot of practical problems as discussed in paragraph 4.

Scheme 10 gives a global overview of aspects the teacher takes into account in his decision making. As stated in the paragraphs 2 and 4 the decision making costs more effort when more details are taken into account.

In many of Dutch schools the educational constraints are rather complex. Governmental guidelines, demands of the schools inspector, demands of parents, and educational demands from within school make the constraints more complex.

In the next paragraph 6 student models will be discussed and in paragraph 7 we will discuss educational alternatives.

In paragraph 8 we will return to the main theme of educational decision making.

### Scheme 10: Data for educational decisions in a Guiding System

<table>
<thead>
<tr>
<th>Educational alternatives available for GS and DS, like:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textbook, handbooks, ideas for lessons and tasks</td>
</tr>
<tr>
<td>Materials, media for students in their learning environments</td>
</tr>
<tr>
<td>Computer programs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational constraints for GS and DS, like:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims, goals, targets</td>
</tr>
<tr>
<td>Available time and timeslots</td>
</tr>
<tr>
<td>Available teachers and specialists</td>
</tr>
<tr>
<td>Types of student in a group</td>
</tr>
<tr>
<td>Available educational materials</td>
</tr>
<tr>
<td>Available classrooms and arrangements</td>
</tr>
<tr>
<td>Compulsory Educational rules</td>
</tr>
<tr>
<td>Educational laws</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>An overview (a model) of what a DS is able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedagogical</td>
</tr>
<tr>
<td>Psychological</td>
</tr>
<tr>
<td>Content</td>
</tr>
</tbody>
</table>

6. Student models

A Guiding System (director, teacher) has to maintain a view on a Developing System (group, student). Every teacher uses student models: sometimes written a scheme, sometimes by heart, sometimes implicit by knowing how good a student is doing in the schoolbook.
Development can be thought of from different perspectives and in different terms. In the schemes \(11^{a,b,c}\) several aspects of description of development are discerned.

First of all development can be understood from different scientific perspectives. There can be development in mathematics, geography, history, language or any subject area. Then a student can be followed in a psychological or a pedagogical way. Or the development of a student can be perceived in an epistemological perspective: following structures and reasoning in the students thinking.

These and other perspectives are like different spyholes, through which different sides of a student’s development can be perceived.

The choice of the mix of these perspectives as used by a GS is very important. Most teachers follow the four perspectives as presented in scheme \(11\), which are used in most textbooks. Once the perspectives are chosen, the question is how to describe students’ progress. There are two important ways of looking to progression: from the curriculum side or from the side of the developing person.

1. In many textbooks progress is described from the curriculum side in terms of progress in the book. The aim of the description is checking whether the student is following the curriculum or not. This way of thinking defines a restricted scope in looking to the student: only that behaviour is observed that has a clear relation with the curriculum.

2. Teachers follow often another way of progress description. They like to see their students unfolding themselves. They want to establish that unfolding. Their student model is open within their chosen perspectives and aims to reflect the students’ unfolding as rich as possible.

Teachers have mental, written or computer based student models. Every student model needs some structure to record student progress.

The textbook is often used as structure, connecting progress and (instructive) curriculum. Goal description is another kind of substratum for student model recording. Teachers can record the goals the student has reached.

A different way is thinking about a student as a novice who has to become an expert. Students’ progression is not described in a curriculum form with its sequential structure, but as a profile of an expert in terms of e.g. competency, knowledge and abilities. The teacher thinks about the learning or unfolding student as filling the more and more the expert profile. The teacher can record student’s progress in an explicitly described set of competencies, knowledge and abilities of an expert. Another solution is comparing the student’s behaviour with a simulated expert: either in the head of the teacher or in a computer (expert system).
A third possibility is to think in terms of unfolding capacities in place of comparing with a predefined expert. It is like the teacher who is observing students in a reflecting way and who is able to establish any new development of the student (within his perspectives). This teacher is thinking in terms like: if this student is able to this, then he might be able to that. This way of thinking is just like thinking of “the zone of next development”, establishing what the student is able to. It is possible the teacher will learn things from his student, then the thinking is not static but developing too.

In the schemes 11\textsuperscript{b} and 11\textsuperscript{c} two types of student models are classified in scheme 11\textsuperscript{a}. In 11\textsuperscript{b} the student model of the most common schoolbooks is represented. In those schoolbooks the content perspective is the most important. Psychological and pedagogical perspectives are taken into account in the curriculum of the textbook, but they are not very explicit in the student model. Nevertheless they have a part in the teachers observations and in the educational decisions of the teacher.
In scheme 11c the characteristics are shown of "Plato and the Math Mirror", a computer program for learning basic operations up to 100, that can keep track of “what a student is able to”. The most sophisticated version of this program is reflecting abilities of children: knowledge of facts, (informal) strategies a child has used and new (informal) strategies the child is able to. This very new kind of student modelling makes it possible to follow the unfolding of children in detail.

7. Educational alternatives

In textbooks most lessons are annotated with goals, needed materials, didactical remarks, and managerial remarks. In a textbook it is not necessary to explain what the students have to know (and should not know) to make a lesson fitting to them. Neither the textbook argues why a lesson is given at the place in the sequence suggested by the textbook. Good teacher-ship and good authorship and a lot of experience in schools are the foundations for sequencing subjects in a textbook and in a teacher’s curriculum. In this sense schoolbooks are very valuable as containers of educational experience, compiled in centuries. But schoolbooks are not flexible enough in flexible
education, generative planned education and education fitting in the socials
demands discussed in paragraph 1. In generative planning the way of thin-
king is just the other way round: the question is what might be the best
alternative for a certain student or a certain group. So educational alternati-
ves are not thought of as an element in a sequence. Educational alternatives
are thought of as fitting or not to a certain stage of unfolding of a student.
“Fitting” can be seen in the same perspectives as the student can be seen, e.g.:
subject area perspectives, psychological, pedagogical or epistemological
perspectives. Good educational planning, specially planning in multidisci-
plinary education, needs fitting within a number of perspectives at a time.

The alternative for sequencing is labelling: each alternative should be
characterised with labels telling important aspects in different perspectives.
Aspects are e.g.: Goals, what a student should be able to, and what he should
not be able to, didactical suggestions, time needed, what the student should
remember, and suggestions for observation and evaluation.

This kind of labelling is becoming common in the Internet environment.
Search engines will help teachers to find interesting sites and educational
alternatives in the web. These search engines are the alternative for hard se-
quencing and they will provide teachers with the opportunity to find the
best fitting task for their students. New curriculum development in SLO is con-
centrating on labelling systems and educational search engines for teachers.

8. Adaptation load in planning

In scheme 1 the educational guiding process is depicted as a cyclic decision
making process. The schemes 2 and 8 are used to introduce the idea of a
Guiding System and a Developing System, where the GS tries to get acqui-
mented with the DS and tries to influence the development of the DS. The
decision making in a GS can be understood as a cyclic process of maintain-
ing a DS-model, and defining a next educational offer fitting in current
constraints and based on available educational alternatives.

In this model adaptation works in two directions: change in constraints
and educational alternatives at one side, and change in a DS-system at the
other side. Educational politicians and sometimes even educational scien-
tists think educational performance will be good if constraints and alterna-
tives are clear. But there are three problems with this idea.
First the teacher has to perform his decision making within human limitations: bounded time, bounded rationality and bounded concentration. Human beings are best in immediate decision making, but in new, changing or puzzling circumstances rational behaviour is necessary. For the human limitations in rationality there is a limit in complexity a teacher can cope with. Second students are learning in unpredictable way inside and outside school. So the interpretation and planning tasks of teachers are complex. Third the educational constraints and alternatives are changing often. The more changes the more energy is demanded from the teacher. Human limitations restrict the ability of teachers to cope with fast changes of students and fast changes in constraints and alternatives. So there is a certain margin for teachers to plan adaptively. In the next paragraphs aspects of adaptation load for teachers will be investigated.

**Aspects in adaptation load**

**Normalisation load**

The word normalisation is used in a physical meaning. The normalisation of a conception is the set of concepts and rules used in theory and calculations. Normalisation is not used in the meaning of “usual”, or fitting in any “norms” or rules. Some teachers are not aware they use any normalisation in their thinking about children. In the worst case they think children are just like themselves. In a less worse case they think children are like theories propose, forgetting that each theory is formulated in a certain perspective and with its own normalisation. The normalisation is the collection of concepts in which a teacher is thinking about the unfolding of his students. A widely spread poor normalisation is the “note system”: students work is
evaluated into a note and students with good notes are good students. In the paragraph about student modelling richer classes of normalisation (student models) are proposed. The richer a student model and the more details involved the more rational normalisation load the teacher has. In adaptive planning the normalisation load is very important. In schools teachers use global student models and they use more detailed models if a student has problems. The larger the problems, the more detailed student models are used. The price for this kind of penny-wise normalisation is that students have hidden problems, until the moment the problems are really big – and expensive to solve. Normalisation has its price.

**Constitution load**
A school has its educational constraints and alternatives. Changes in constraints and alternatives affect directly teacher’s routines. Introducing a new schoolbook, changing school organisation, introducing new goals or new didactics or whatever makes teachers more thinking about their work, demanding more rational and emotional energy. The word “constitution” is used in the sense of both “physical nature” and “body of laws”, and covers the idea of the “playground” of the school. Changing the playground demands new orientation and rational decision making. The constitution load has two parts. First a school with many rules, materials, didactical alternatives demands a lot of experience and energy of its teachers. Second a change in the schools’ constitution demands a lot of energy, even more if the constitution is already complex.

In the Netherlands schools in the fifties and before had classes of 40-60 children of the same age. There was a schoolbook and there was very little interaction between the groups. Teachers were rather independent in their groups. Constraints were simple: the timetable being the most important. Today schools have complex and dynamic group structures, much attention for low gifted children, more information flow (paragraph 4) and much deliberation about didactics and pedagogical policy. The constitution load is much larger than in the fifties. So teachers have to think in more synchronised processes and levels of educational decision making. Constitution has its price.

**Evaluation load**
Evaluation is not used in the meaning of giving notes, but in the meaning of becoming aware of what is going on and assessing it. In case of planning of new tasks for students evaluation has to do with interpreting students behaviour into a student model and assessing progress in that normalisation. Evaluation load is heavier when the student model is more complex. But
more important is that evaluation load is increasing when working with very heterogeneous groups, or different tasks for individual students.

As stated in paragraph 6 teachers use more refined student models in case of problems. The evaluation load increases very fast when a school wants to pay attention to the high and low gifted students. The evaluation load increases more if the school wants to plan preventively to avoid problems with e.g. lack of basic knowledge. In that case teachers should maintain detailed models of all children.

Today schools often have to care for their pedagogical tasks: the wish of parents to have the best chance for unfolding all capacities of their child makes school should be interested in more aspects of personal growth than the usual school subject areas. In terms of paragraph 6 about student models: more perspectives are involved and the scope has to be open (reflective).

In the fifties we had a rather simple way of evaluation: look after students work, give a note, and if positive continue to next page of the textbook. If not positive explain things again. Today we see – influenced by constructivism – attention for many aspects of the unfolding person, and more refined educational techniques to influence the unfolding process: and therefore refined observation, interpretation and evaluation techniques and tools. Often this refined thinking is beyond the intuition of teachers: a lot of rational thinking is involved. Evaluation has it price.

Differentiation load
The more refined student models teachers use, the more they have to prepare carefully their interventions. One consequence is that teachers need more refined educational alternatives. A second thing is they need more didactical, pedagogical and managerial experience, knowledge and skills.

In former days it took a few years for teachers to get acquainted with a schoolbook. Now they have a schoolbook and a lot of additional materials. And all of these are changing rather fast or have to be used in a new way for changing constraints as governmental directives or new scientific ideas.

The wish to be open to the world gives another complication in planning education: teachers do like to follow in some degree the actual interests of their students. If they like so they have to make their planning in the “last minute” or during communication with students and that demands creativity, good accessible educational alternatives and a good didactical overview.

In case of low gifted or high gifted students the teacher has to find a good fitting alternative. In school practice that is a problem: teachers have journals, handbooks, textbooks, additional materials and the have to find something from that not very accessible file. Maybe Internet will help teachers to find in a fast way what they need.
Differentiation demands overview and good accessible alternatives and time for creativity and quality. Differentiation also has its price.

**Adaptation load**

In the cycle of educational decisions we can see (scheme 13) normalisation load, constitution load, evaluation load and differentiation load. These four together can be defined as adaptation load.

Up to today textbooks could vigorously reduce the adaptation load. Student model, curriculum, testing and planning are taken together in a curriculum, leaving a reduced planning task for the teachers. The more differentiation, the more differentiated the student model, the more complex the organisation the heavier the adaptation load and the less a textbook can help.

**Scheme 13: Adaptation load**

We need solutions reducing the adaptation load by offering support for teachers having bounded rationality, bounded concentration and bounded energy, in order to cope with the trends mentioned in paragraph 1. An interesting alternative might come from the side of information technology.

**Scheme 14: Generative planning and needed information**

<table>
<thead>
<tr>
<th>Educational constraints</th>
<th>Educational alternatives</th>
</tr>
</thead>
</table>

Task fulfilled by a generative planning system:

- Look what a student is able to;
- Look which educational alternatives are fitting (zone of next development);
- Choose next alternative fitting within the educational constraints.
9. Generative planning

Scheme 14 gives in short the definition of the generative planning task.

The first part is maintaining the student model, as discussed in paragraph 6. The second part is looking for educational alternatives as discussed in paragraph 7. The decision making within the educational constraints is the subject of this paragraph.

In scheme 15 generative planning is related to the concept of adaptation load as discussed in paragraph 8.

In school teachers try to reduce adaptation load to a minimum. Normalisation load is reduced by using a textbook and is mostly reduced to the subject-area-perspective.

Using standard tests and notes reduces evaluation load. If a student has problems a richer normalisation is used and more detailed evaluation is done. Looking for educational alternatives is reduced to what the teacher knows (professional skills), collegial consultation and some literature. In the instructional guidance (scheme 7) the teacher’s skills have the main part, in the educational and in the school guidance consultation and literature have an important part too.

In scheme 16 the generative planning task is supported by an advisory computer system. The system can offer any educational alternative to the teacher or to the students.
The system has some data concerning constraints and it has a database with (ideas for) educational alternatives. From the teacher, from students themselves or from a testing-computer program the advisory system has some student model.

The advisory system is programmed with decision rules for planning further education. Generative planning systems can be made in all layers of school organisation (scheme 7) and with different use of computers.

1. a shelf with well documented educational alternatives in school, where a teacher can find educational alternatives fitting to his personal (informal) student models;
2. a database with well documented educational alternatives where a teacher can find something fitting to his personal (informal) model of his class;
3. a pencil and paper testing program resulting in an overview of learning progress of a class or student and giving a basis for 1. or 2.;
4. a student model, based on tests, teachers’ observations and students’ input as a basis for planning like 1. and 2.;
5. an advisory system that can provide a teacher with educational alternatives fitting to a profile the teacher has given of his student(s) in combination with 2.;
6. a completely automated generative planning system that can suggest educational alternatives based on 2., 3., 4. and 5.

Scheme 16 visualises these different systems.

In SLO we made a complete generative planning system for primary arithmetic: “Plato and the Math Mirror”. This program is presented in the next paragraph.

10. “Plato and the Math Mirror”: an example of generative planning

“Plato and the Math Mirror” (PAM) is a computer program for reflectively training basic operations with understanding of strategies (7-8 years old children). A child working with the program has three different “electronic worksheets”: Screen 1, 2 and 3.
The work-screens in “Plato and the Math Mirror”

In screen 1 a child solves 45 + 38 by replacing 38 by 40 - 2 (38 is nearly 40) and gets 45+40-2. Then he marks with the mouse 45 + 40 and types 85. This is visualised in the small field at the right upper side. Then he gets 85-2 and then he can type 83. The full solution in the worksheet is:

\[ 45 + 38 = 45 + 40 - 2 = 85 - 2 = 83 \]

At the right side of the screen four icons are drawn: a sorcerer, a coach, grandfather and Plato. The sorcerer can represent an exercise in another worksheet. The coach gives the goal of the exercises, e.g. “try these exercises, use the help of the bears (underside of the screen), ask Grandfather for help and follow the remarks of Plato”. The bears represent strategies. For instance the mouse can split numbers (48 = 40 + 8 or 48 = 50 - 2), the most right bear gives neighbours of an exercise (6 + 5 has neighbours 5 + 5 and 6 + 6). The most left bear makes round exercises: 48 + 29 is nearly 50 + 30.

The second screen shows a representation in which children can shorten count-strategies. The screen shows the exercise 45 - 28 as:

\[ 45 \rightarrow 35 \rightarrow \ldots \rightarrow 10 \rightarrow \ldots \rightarrow 8 \rightarrow \ldots \]

Children can make the steps but don’t have to fill all in between answers. They can use the bears to split numbers and arrows, but they can write it too.

In the third screen (the numberline) the student can do the same operations on the numberline.
**The characters in “Plato and the Math Mirror”**

All explanations of Grandfather and all proposals of the bears are checked with the pupil model. If a neighbour is proposed (e.g. 25 + 25 as neighbour of 27 + 28) the program – in fact the background program “Arithmeticus” – checks whether 25 + 25 is really easy for this student, whether the differences between 27 and 25 and between 28 and 25 are easy and whether the child can do 50 + 2 + 3 easily.

The student model in this program is very important. For each individual child a history is maintained of each type of exercises and of each individual fact. Arithmeticus knows which strategies are good for the teacher and it knows what basic knowledge is necessary to perform that strategy on each type of exercises. So Arithmeticus can predict in some sense which exercises are well to do for the child. The explanations and hints of the characters are well tailored for the student working with the program.

**The global process in “Plato and the Math Mirror”**

Scheme 17 presents the global process in “Plato and the Math Mirror”. A student works in one of the screens (worksheets). When he has solved an exercise the annotated solution steps are sent to the evaluation program. This program decides how good the student has made this exercise. In the regular version the number of steps, correctness and speed are taken into account. In an experimental version the evaluator makes an interpretation and evaluation of the students strategy too. The evaluated solution is sent to the student’s model, in which histories of types of exercises are maintained.

Scheme 17
Once there is a student model, later evaluations can be compared to the student’s model and the evaluation program can see whether the trend in the solutions is positive or not. Comments are given to the student via the coach and via Plato. The comments can be like: “You are doing this kind of exercises better than before”, “Your level with these exercises is very good now: you are getting a certificate.” or “Come on, you did better before!”.

The histories define what types of exercises are easy for the student, which are rather well known and which are “starting” or not yet done at all. Arithmeticus is a program that can create strategies a student is supposed to be able to and that can test whether there are strategies for the student available with which the student can solve an exercise. So Arithmeticus can calculate what is easy for a student and what belongs to the “zone of next development”.

The data in the student model are important for the teacher. The teacher has a special interface to inspect the student’s results (scheme 18). The student-model gives information that is not available in with usual testing. The model is more detailed and it decides if something is known or not on behalf of a history. The student-model gives an indication of the persistence of the knowledge.

The student-model gives warnings to the teacher by exclamation marks as shown in scheme 18 if there are negative trends in any history.
Arithmeticus can evaluate what a student is able to and that knowledge is used (scheme 17) to provide relevant information for the student via the characters in the screens and to plan new exercises. The planning process runs globally in this way: Arithmeticus tests which domains might be accessible for the student. Then it creates sets of exercises for each domain and tests for each exercise if the student might solve it with at least one “teacher permitted strategy”. If that is all right the program adds some presentations to the set of exercises telling in which worksheet the exercises have to be presented and how the screen has to be composed. (Each screen can behave in different modes).

**Generative planning**

Scheme 19 presents a global overview of the planning process in “Plato and the Math Mirror”.

*Scheme 18: the teacher's interface to inspect the student's results*

*Scheme 19: The generative planning in "Plato and the Math Mirror"*
The system has global aims: training basic operations up to 100. The combination of the student model with Arithmeticus can predict what is easy for the student and what is good new stuff. The planner and helper produce individually fitting goals, tasks and well-tailored help. An individual student model is not growing in a linear way, but as a field where initially grass is coming up so every here and there and after a time there are stronger and weaker clumps from where more grass is growing.

Some parts might become bad, but the planner takes them in account again until it re-flourishes.

The combination of Arithmeticus and the student model is an operationalisation of an adaptive planning system. This combination is a tool for the teacher in the instructional and educational layers in school that decreases adaptation load in school. Experiences in school are confirming this.

11. Conclusions

The demand for adaptively and openly planned education is growing for social and educational reasons. School will not be any more the only institution where students are learning. Therefore schools will need more flexible planning, well tailored to the needs and capacities of the students. Generative planning is already used in small educational settings, but it will be a dominant planning paradigm in future.

Adaptation load is a composition of normalisation, constitution, evaluation and differentiation load. The more a school wants to plan in an adaptive way, the more these loads are increasing. Traditional textbook-solutions can not provide substantially new solutions, because of the bounded rationality of the teacher. For generative planning schools will need planning support systems. “Plato and the Math Mirror” is an example of a full generative planning system connected with a highly interactive learning environment.

Textbooks will loose their part as planning instrument in school, because textbooks cannot reduce the adaptation load in the degree planning support systems can do. Besides teachers need more educational alternatives than a book can provide.

In the context of adaptive education we will see: The exit of textbooks and the rise of flexible educational media.
1. Normalisation load:
   For the complexity of the total planning process textbooks provide only
   a rather poor normalisation of pupil activities.

2. Constitution load:
   The complexity of constraints and alternatives becomes large: school-
   books cannot help to handle that complexity in a practical way.

3. Evaluation load:
   Observation by teachers and computer testing supported by pupil mo-
   delling systems can provide many-sided evaluation. In the usual text-
   book-using education only restricted pupil models can be maintained.

4. Differentiation load:
   Detailed pupil models and generative planning systems can substantial-
   ly supplement teachers’ bounded rationality.

5. For improving adaptive education, we need to lower the adaptation load:
   Textbooks will lose their planning function. Computers will take that part.

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1 This program will be discussed further in detail in paragraph 10. “Plato and the
   Math Mirror”: an example of generative planning
Programmed Heteroglossia – Critical Analysis of a Computer Interface

**Introduction**

This paper grew out of a simple question, the question of how to do critical discourse analysis of contemporary computer ‘texts’. The question may be simple, answering it is not. The methods of critical discourse analysis are oriented towards analyzing the choices made in the articulation of texts, not towards analyzing the choices provided for text-makers by computer programmes. And the critiques of critical discourse analysis have focussed on critiquing the uses of languages, rather than on critiquing the languages used.

One way of studying computer ‘texts’ would be to study their use. The term suggests that reading a computer text is a more active process than reading a traditional text. Readers become to some extent writers. They continue and complete the work of authoring the text, so that each text can be read/completed in multiple ways. This idea of more open texts and more active readers had already been anticipated in literary and semiotic theory (e.g. Eco, 1979). But now the reader’s choices have become visible. We can actually observe and record what readers do when they use computers.

The other side of the coin is less often emphasized. ‘Use’ can also be seen as a more passive form of writing, a writing system in which the writers’ options are much more limited than if they had had (at least potentially) the whole of their language and culture available to them. This too had been theoretically anticipated, in earlier, structuralist, theory, e.g. in Barthes’ account of narrative: ‘Rather than (...) art, talent or genius – all mythical forms of chance –’, the storyteller’s ‘art’ is the ‘ability to generate narratives (messages) from the structure (the code). This art corresponds to the notion of performance in Chomsky and is far removed from the ‘genius’ of the author, romantically conceived as some barely explicable personal secret’ (1977: 80).

In this paper I focus on the code, the system within which users must operate, This could be seen as a return to the classic position that the semio-
tic system, the *langue*, is the primary object of semiotics (Saussure, 1974:11). But there is a difference. Computer programmes are not arbitrary systems which are ‘outside the individual who can never create or modify them by himself’ (ibid: 14). More often than not they are the deliberately designed product of powerful global corporations. And while using language always has the potential of feeding back into the language system, and affecting its shape and development, this is not so with computer programmes. Sources of change must be looked for elsewhere, for instance in alternative design practices, or consumer action. No longer is it true that ‘whoever creates a language controls it only so long as it is not in circulation’ (ibid: 76).

This paper explores a particular interface, the so-called ‘guide interface’, as a code which governs the way users can construct ‘texts’ in using a particular CD-Rom. It will suggest that the regime of control imposed by this interface is not unique to textual control, and can also be found in other modes of social control. In others words, it suggests that systems of textual cohesion and textual ‘interactivity’ can be modelled on, and themselves provide models for, social cohesion and social interactivity. More than a suggestion this cannot be at this stage. But I hope it will be a useful and productive one for extending critical discourse analysis work into the area of computer texts.

The Guide Interface

The so-called ‘guide interface’ was pioneered by a group of designers in the United States, Tim Oren, Gitta Salomon, Kristee Kreitman and Abbe Don in 1988. They were concerned about the way users of educational data-bases became disoriented and ended up just clicking aimlessly from screen to screen, in the way people might walk through an all too large art gallery, moving rapidly from room to room, only briefly glancing at the paintings, and stopping at random from time to time to look at one painting in a little more detail. Not the best way of viewing if it is the aim of the exercise to learn something.

To counteract this effect, they decided to provide computer users with ‘travel guides’, who would lead the way and navigate the user through the informational labyrinth in more or less coherent fashion. The database they were working with dealt with American history and was adapted from a 9-volume encyclopedia into the kind of fragmented and more or less self-contained screens with short texts which the computer requires. Contemporary multimedia production often uses existing ‘content’ in this way, first ‘re-formatting’ it, and then passing it on to interface designers whose job it is to make the database easy and pleasant to use.
In the first version, the guide interface gave users a choice of guide from a set of stock characters such as the ‘Slave’, the ‘Indian’, the ‘Preacher’, the ‘Diplomat’, etc. None of these characters knew the way in all of the database. They only knew as much of it as pertained to their own interest – the ‘Slave’, for instance, would guide the user towards topics related to slavery and abolition. In a later version the characters were given a biography – the ‘Preacher’, for instance, was now born in New York during the Reformist period, had been a left-winger for some time, became active in the Abolition movement, and later worked as a missionary in the Oklahoma Indian territory. This provided the guides with a broader range of interests and helped ‘narrativize’ the guided tour – by now the designers had decided that it was important to build narratives on top of the systematically organized database.

When the designers tested this interface on users, two things became obvious. Firstly, they realized that they had in effect ‘re-linearized’ the database. Users did not take the opportunity to explore and branch out, but meekly followed the guide. The result, they felt, was too much like television, and not interactive enough. Secondly, users wanted to know whether they were actually seeing and hearing the events from the guide’s point of view, whether, for instance, they were actually getting a slave’s point of view or not. They were not, of course, because the same screens were used by different ‘guides’ in different contexts.

These two considerations became part of the further development of guide interfaces. Opportunities for free exploring were to be built into the guided tour itself, and efforts were made to provide different viewpoints, different discursive constructions of the same content, given in by the different interests and backgrounds of different guides. These were explicit design objectives:

Guides suggest a natural way to present multiple voices and points of view. Rather than a singular, omniscient voice, users would be presented with multiple voices and would be placed in a position to draw their own conclusions. Closure resides with the users as they interact with the database. (Oren et al, 1990: 377)

Subsequently the guide interface has been used in a number of different CD-Roms, some of them featuring actors and actresses as guides – out of costume’, so as to ‘build on a Brechtian model from theatre and explicitly acknowledge the computer system as a representational medium’ and ‘address the issue of provenance and bias of information’ (ibid: 379). Concepts which, during the past 30 years or so, have been associated with the analysis, interpretation and critique of texts (‘point of view’, ‘heteroglossia’,
In the next sections a guide interface will be analyzed in a little more detail. It is a widely distributed ‘edutainment’ CD-Rom called ‘Dangerous Creatures’, published by Microsoft in 1994, six years after the first guide interface experiments. It is primarily aimed at children, and, if I am right, it not only teaches them bits of encyclopedic knowledge about such wild animals as still exist in this world, but also particular modes of social interaction and particular disciplines of individuality and conformity. They do so through the very way in which they guide and structure the user’s activity, the things users can and cannot do. As Eco noted almost twenty years ago, in a discussion of the ‘open text’, ‘In the last analysis what matters is not the various issues in themselves but the mazelike structure of the text. You cannot use the text as you want, but only as the text wants you to use it. An open text, however ‘open’ it be, cannot afford whatever interpretation. An open text outlines a ‘closed’ project of its Model Reader as a component of its structural strategy’ (1979: 9).

The guides as ‘discourse technologists’

The flowchart in figure 1 shows the trajectory of the guided tours. Rather than representing what happened during a particular tour of the ‘Dangerous Creatures’ database, it shows what users can do, what options are available to them when they choose this particular tour. As the arrows in the chart indicate, they can for instance move from a Guide Introduction Screen to a Guide CV Screen, and vice versa, but not from a Guide CV Screen to a Topic Information Screen.

The format of the other eleven tours is almost identical. Such small differences as do occur are indicated by the dotted lines in the flowchart. The flowchart as a whole, with the dotted lines included, can therefore be said to represent the code which the designers imposed on themselves when they ‘packaged’ the tours.

It should be remembered that the guide interface is just one of a number of ways of entering the ‘Dangerous Creatures’ database. It can also be treated as an encyclopedia, by using the alphabetically organized index. Or it can be used to explore particular themes, such as ‘habitats’, or ‘weapons’ – users then enter by first choosing a region and then an animal from that region, or first a type of weapon such as ‘jaws’ or ‘fangs’ and then an animal possessing that weapon. It should also be remembered that users can at any moment leave the tour and change to another mode of accessing the information, by clicking one of the icons at the bottom of the screen.
Users who choose the guide interface will first see what I have called the ‘Guide Selection Screen’ (fig. 1)

![Guide Selection Screen](image)

**Figure 1: Guide Selection Screen**

By means of this screen they can choose one of twelve guides. Visually, the screen is an example of what Kress and Van Leeuwen (1996: 79ff) call a ‘classification’ image – the pictures of the guides are symmetrically arranged across the screen to indicate that they are all members of the class ‘guides’. As is often the case in ‘conceptual’ images, words are printed inside the picture space – captions, in red, indicating the kinds of tours the guides can conduct, the kinds of sights they can show, the kinds of stories they can tell, etc:

- **(top row)**
  - Amazon Adventure
  - Australian Walkabout
  - Native American Trek
  - African Safari

- **(middle row)**
  - Male and Female Roles
  - Really Tough Shots
  - Dumb Things People Do
  - Coral Reef Dive

- **(bottom row)**
  - Native American Stories
  - Tales from Asia
  - Aboriginal Dreamtime
  - African Stories

Strangely enough the background, in soft pastel colour, shows only three guides – a young female ‘wildlife photographer’ on the left, a middle-aged
male ‘zoologist’ in the centre (and taller than the two women) and a grey-haired female ‘story-teller’ on the right. On closer inspection it turns out that there are in fact not twelve but only three guides, each of them appearing in four different disguises, the ‘zoologist’ on the top row, the ‘wildlife photographer’ on the middle row, and the ‘story-teller’ on the bottom row. In other words, they are actors. They dress up in different costumes for the different guided tours which they can conduct. The grey-haired woman is neither a native American, nor an Aboriginal but a white North American expert in ‘world storytelling’, who dresses up as an Aboriginal woman to tell Aboriginal stories, as a native American to tell native American stories, and so on.

After selecting a guide, users encounter what I have called the ‘Guide Introduction Screen’ (fig. 2):

Figur 2: Guide Introduction Screen

With the title of the ‘tour’ as a headline, the picture shows on the left a written text and on the right the guide him- or herself, hailing the viewer. In the background, in softer focus and colour, there is a ‘wild’ landscape. The text is not only written, but also spoken, except for the instruction to click on to the next screen, which is only spoken. Here are examples from two different tours:
Amazon adventure:
(excited male voice)
Welcome, gather round. Our paddlers are just about ready to take us on a birdwatching trip down the river into the Amazon rainforest where, if we’re lucky, we’ll see a flock of brilliant parrots on the wing. Click my button when you’re ready to get underway.

Aboriginal dreamtime:
(soft, soothing, young female voice)
Once upon a time, there were no computers – like the one your’re using now – no books, no pens, no paper. There was no way to hold on to history, except by telling it, over and over. The Aboriginal people of Australia began doing that thirty thousand years ago, when they first came to Australia from Asia. Click my button to hear the first part of the story.

Before ‘getting underway’ or ‘hearing the first part of the story’, users may call up what I have called the ‘Guide CV Screen’ (fig. 3), to learn some ‘facts’ about their guide and his or her qualifications.

The screen is superimposed on the Guide Introduction Screen. With the frayed edges of an old document, it shows the guide on the left (the same picture as in the Guide Introduction Screen) and text on the right. The guide’s name (Safara’, ‘Fergus’, ‘Tawny’) is used as a headline. Here is the CV of ‘Safara’, the grey-haired story-teller:

**Education**
- Has travelled around the world, collecting thousands of traditional stories

**Favourite colours**
- Celestial blue, dawn pink

**Favourite foods**
- Ambrosia, rose-hip tea

**Hobbies**
- Transcendental meditation, teleportation

**Professional association**
- President of the International association for Truth in Storytelling

**Cool fact**
- Safara has been seen in several places at once.
From this construction of the role and identity of the guide the young users of ‘Dangerous Creatures’ can learn three things. First they learn that the teller of the Native American stories, the Asian stories, the Aboriginal Dreamtime stories and the African stories has only one voice, and that this is not the voice of an old woman, but a smooth, young, and very professional voice, without a trace of accent. She is not an authentic Aboriginal storyteller, but only what Goffman (1981) called the ‘animator’, of her words. This does not mean that she has no authority. Her CV shows that she is a shining example of the contemporary ‘discourse technologist’ (Fairclough, 1996: 73). Having ‘travelled around the world, collecting thousands of traditional stories’ and being ‘President of the International Association for Truth in Storytelling’, she is, to use Fairclough’s words, an ‘expert with privileged access to scientific information’, whose words ‘carry the aura of ‘truth’, and she holds an ‘accredited role associated with accredited practices and routines in institutions’ (ibid: 73). Her voice and presentation, and her ability to assume different roles, show that she is, in addition, an expert in ‘the design and projection of context-free discourse techniques’, the ‘standardisation of discourse practices’, ‘strategically motivated simulation in discourse’ and ‘changing discourses affectively’, making them more entertaining (ibid: 73-74).

Secondly, users learn that interests, expertise, and membership of associations are co-classified with matters of taste and consumer choice as lifestyle choices. In the same way that modern supermarkets know how to cater for the environmentally conscious consumer, the ‘ethnic’ consumer, the impulsive buyer, and so on, this CD-Rom knows how to cater for the Hippy/Green lifestyle, the Adventure Sport lifestyle etc. Or at least, it shows its young users that, to gain access to information, to become ‘information-rich’, they must align themselves with a ‘cool’ adult lifestyle of this kind.

Thirdly, users learn that the visual mode creates similarity and the verbal mode difference. Visually the tours are remarkably similar. The twelve guide introduction screens and CV screens look almost identical. Even the landscapes in the background show only minor variation, as though all they need to signify is the general idea of ‘wildness’ and ‘danger’. Verbally, however, there are differences, not only in the voices used, but also in the genres. In the two examples above, for instance, the zoologist uses the genre and language of the ‘group leader’s announcement’, characterized by the imperative, the first person plural and the future tense, in other words by things ‘you’ must do and things ‘we’ are going to do, while the storyteller uses the genre and language of the story, with its stock phrases (‘once upon a time’), its focus on 3rd person actors and past events, and its concern to provide orientation in time and space.
This division of labour between the visual and the verbal is not unique to computer texts. Everywhere the visual increasingly realizes global similarity. Cities, motorways, tourist resorts, airports, postmodern shopping centres, they all look similar the world over. The auditory, on the other hand, increasingly realizes the local and the ‘subcultural’. Even on the BBC, where not too long ago only one kind of English was permitted (except for purposes of comedy) many accents can now be heard. And the influence of advertising language, the ‘marketization of discourse’ (Fairclough, 1993) has caused a postmodern heterogeneity of voices and styles to enter spaces where earlier the uniformity and formality of bureaucratic rationality held sway.

A guided tour

Let us now follow the guide. The first screen in the ‘Aboriginal Dreamtime Stories’ tour is what I have called an ‘Activity Introduction screen’ (fig. 4). This kind of screen is only included in tours which have a more or less specific setting, here a fairly detailed and realistic Australian ‘Outback’ landscape, with a kangaroo bottom right.

![Figure 4: Activity Introduction Screen](image)

Whatever the screen that follows the Guide Introduction screen, as soon as the tour begins in earnest, written and spoken text begin to diverge. The example is, again, from the ‘Aboriginal Dreamtime Stories’ tour:

**Written text**

Australia is the flattest and driest of all the continents, so much of it is covered by desert. Australia was once connected to other landmasses, but it drifted away from them long ago. Its primitive *marsupials* and *monotremes* were protected by their isolation and were not replaced by animals that evolved later.

**Spoken text (same voice as in the ‘Guide Introduction Screen’)**

In the beginning time, the spirit ancestors of the Aboriginal people
lived on earth and they had the characteristics of both animals and people. They dreamed a long dream and in that dreaming the creatures of the earth came to be as we know them now.

*The spoken text is followed by intermittent sound effects of distant thunder and crickets.*

The written text, indeed, the whole ‘Australian Outback’ screen, is part of the database. The same screen is also selected in other contexts. In the ‘Aboriginal Dreamtime Stories’ tour it functions as a kind of setting, elsewhere it is an example of a desert landscape, a variety of Australian landscape, the habitat of a particular Australian animal, a site forming part of the ‘Australian Walkabout’ tour. The screen forms part of the vast discourse of the database itself, but that discourse can never be observed directly, never be grasped in its own consistency. It remains hidden, buried, and only becomes visible in the form of fragments and snippets which are then recontextualized and incorporated in the various guided tours whose cohesion is formed in the first place by the spoken text.

When written and spoken language co-occur in the same context they can have a variety of relationships to each other. The writing can be the original or sacred text, the speech its interpretation and its relevance to us-here-and-now, as for instance in the scripture readings and sermons of a Church service. Or the writing can be the basic information, the speech its explanation and exemplification, as in lectures with handouts or overhead slides. Or, as perhaps in this case, the writing can provide the facts, the spoken text the ‘point of view’, the ‘commentary’, the ‘interpretation’ which leaves the factuality of the facts unaffected even as it newly contextualizes and interprets them. As the designers of the first guide interface put it, the guide interface is a ‘central factual nugget of names, dates, places, with a constellation of points of view around it’ (Oren et al, 1990: 377). I will return to these points in the final section of this paper.

We now come to the first ‘interactive’ element of the tour. At any point, users can ask for definitions of highlighted terms (such as ‘marsupials’ and ‘monotremes’ in the example above). These definitions are then superimposed on the screen (cf fig. 5), and the terms are also spoken, in this case by the voice of the guide herself, the Aboriginal storyteller, but sometimes by voices other than those of the guide. This means that the user will encounter ‘Safara’s’ voice in a number of different contexts and learn that it is in fact not Safara’s voice, but the voice of a professional presenter or actress who may play one role today, another tomorrow.
Clicking the Guide icon, users will be taken from the Activity Introduction Screen to what I have called a Topic Information Screen (Fig. 6). The screen again provides authoritative and factual written and visual information. Often two or three pictures form a kind of collage with two or three bits of texts, one of which then has a more prominent headline, as in fig. 6. In other Topic Information Screens there is only one picture and one text. But in every case the pictures are what Kress and Van Leeuwen (1996: 89ff) have called ‘analytical’ – pictures which serve to clearly display the key visible characteristics of what they depict, and which are decontextualized, set against a neutral background (unless they are about landscapes). The spoken text continues the story-telling and is, again, followed by a loop of intermittent sound effects.
Here are the texts of the first Topic Information Screen of the Aboriginal Dreamtime tour:

**Main text**

**Death Adder**
There is a good reason that this Australian snake is called the ‘Death Adder’. Before an antivenin was developed, half of the people bitten by it died. Luckily, the death adder is not very aggressive and bites only if touched.

**Subsidiary texts**

Not really an adder
Death adders aren’t really adders, so the name is not very accurate. The death adder’s closest relations include cobras, coral snakes and mambas, like this black mamba.

Hidden danger
Most snakes flee when they sense footsteps. But death adders act like they don’t notice them – that’s why they’re also called “deaf adders”. These snakes lie motionless under leaves, so it’s easy to step on them. That’s how most people get bitten.

**Spoken text**
*in the guide’s voice*

In that time there was not yet death. It was the fault of the first humans that death was led into the world (*didgeridoo music starts*). For the moon came down to the earth and said to them: “If you carry my pets across the river you will rise again after you have died and so live forever” (*didgeridoo music fades out*). But the humans refused. They were afraid of the moon’s pets which were all deadly snakes. So the moon said: “Silly humans. Now when you die you will stay dead and I will always send you poisonous snakes to remind you that you disobeyed me.

* A loop of intermittent sound effects: birds and frogs; indeterminate rustling.

After a number of these Topic Information Screens, users are taken to a different type of screen. I have called it a ‘Topic Exploration Screen’ (fig. 8). It provides basic information about a topic and allows users to ‘explore on their own’, and branch out into related topics of their choice. The spoken texts of these screens continue the guided tours and are therefore no diffe-
rent from those of the Topic Information Screens, but the written texts and pictures differ. They are more eyecatching and dramatic and involve action processes rather than static, descriptive processes. Instead of relational clauses such as ‘The death adder’s closest relatives include…’ we have material process clauses such as ‘Coiled and ready to strike, a mangrove snake opens its mouth…’ Instead of generic reference (‘death adders…’) we have specific reference (‘a mangrove snake…’). Instead of decontextualized analytical pictures we have pictures that show the ‘dangerous creatures’ involved in an action, and located in their habitat.

![Mangrove Snake](image)

**Figure 7: Topic Exploration Screen.**

Here is the written text of the first Topic Exploration Screen in the Aboriginal Dreamtime tour:

Coiled and ready to strike, a mangrove snake opens its mouth in warning. Its threat should be heeded – like many wasp-coloured animals, it’s **venomous**. The snake lives in South-East Asia, spending its days resting in the branches above saltwater **mangrove swamps** and hunting in the evening. Its venom isn’t lethal to humans, but the big snake’s bite could be painful.

The screen also contains a number of hot’captions, in red, which can be clicked to reach the Subtopic Screens. One of these has a movie icon next to it:

- Salt swamp
- Tree snakes
- Odd neighbours
- Snake or fake?
- Vicious vine
- Rear-fanged snakes
As already mentioned, the spoken text continues the tour:

**Spoken text**

*(in the guide’s voice)*

One of those snakes was the mangrove snake. One day he was complaining to his friend the whipsnake: “Yeah, I am very poisonous, but I am so slow, the humans are always chasing me and I must bite them when they catch me. It is quite exhausting.” The whipsnake, who was very fast, but perfectly harmless, said: “Let me have your poison teeth, so the humans won’t hate you anymore, and since I am too fast to catch, I won’t need to bite them.” The mangrove snake agreed and ever since he has been only poisonous enough to kill his food, and humans don’t bother him.

*Loop of intermittent sound effect of splashing water.*

Allied to every Topic Exploration Screen is a Fact Screen. Fact screens invariably concentrate on six kinds of fact. Three of these are realized verbally: information on how the animal in question *kills*, information on what the animal in question *eats*, and a warning:

- Kills by injecting venom through its fangs
- Birds, small mammals, frogs, lizards, and other snakes
- Watch your head! A mangrove snake spends as much time slithering through the trees as it does hunting on the ground.

Three others are realized visually: there is a map to show the animal’s *habitat*, a picture to display its *size* in comparison to a human being, and an analytical picture of the *animal* itself. The dangers posed by the animals are shown on the left, in ‘Given’ position. The visual information is ‘New’. A special warning is spoken by the excited voice of the zoologist:

When a rattlesnake rattles that means you’re too close. Back off!

From the Topic Exploration Screen one can also reach Subtopic Screens by clicking the ‘hot’ captions mentioned earlier. They are essentially identical to Topic Information Screens. But the spoken texts are items of information read, not by the guide, but by another, impersonal voice.

**Spoken text**

*(professional male voice)*

How can you tell snakes and legless lizards apart? Look for eyelids

*Followed by sound effect of rustling.*
One of the subtopic screens includes a short movie showing an animal in action. Finally, Subtopic Screens contain an icon, top left, which can lead users to a related topic, for instance from snakes to eels, or, if the screen deals with the animal’s camouflage, to the camouflage of other animals. But if this icon is clicked, a warning appears. A box is superimposed on the screen:

**Guided tour**

You have made a choice that will lead you away from the guided tour. Do you want to leave the tour now and explore on your own?

OK CANCEL

Users who heed this warning, and continue to follow ‘Safara’, will hear more stories – stories about echidnas, about spiders, kangaroos, dingos, platypuses and koalas, in a sequence of six Topic Information Screens, one Topic Exploration Screen and one further Topic Information Screen. Then the tour closes:

And so the Dreamtime passed away and the spirit ancestors moves to a mysterious place. But they left us the Earth and its creatures, to love and cherish. This is the end of the voyage into Dreamtime. To go where you will click the ‘content’ button below and explore by yourself. If you want to hear more tales, click my button, to return to the Guide Screen and then choose a new path.

**Programmed heteroglossia**

The question is, to which extent do the different guides really provide different points of view? Going by the spoken texts, to quite some extent. In Safara’s version of the ‘Dreamtime’ stories it is humans, not animals, who bring death into the world, while animals try to avoid attacking humans (‘Let me have your poison teeth, so the humans won’t hate you anymore, and since I am too fast to catch, I won’t need to bite them’). The spirit of the story is that we should ‘love and cherish the Earth and its creatures.’ Other guides tell different stories. Tawny, the wildlife photographer (Favourite colours: fire engine red; sunset orange; Hobbies: skydiving, embroidery, jeep repairs), invites users to imagine themselves in the male and female roles of animals, using direct address and introducing the vocabulary of human social affairs into the description of animal behaviour. What follows is the spoken text of the first three screens in her ‘Male and Female Roles’ tour. The tour continues along the same lines:
If you’re a female black widow spider you’ve got it made. You’ve only got to worry about predators that want to eat you (laugh) and most wild animals have to do that. But if you’re male you’ve got to watch out for predators and you’ve also got to worry about the intentions of that female spider you’ve been seeing. A lot of black widow spiders don’t get the chance to kiss and tell because the females eat them after they mate.

If you’re a female lion, it’s mostly up to you to bring home the bacon, and the zebra, and the wildebeest, and then the males eat first, the ungrateful beasts, and you get what’s left over. Now, if you’re a male lion you can lay around a lot of the time, but it’s your job to protect the pride and sooner or later you’ll have to face something really scary. As a male lion you’ll have to fight with other males to keep your territory. So you better keep in shape or you’ll soon be sitting on a termite mound all by yourself, wondering what went wrong.

If you’re pretty sociable and you have leadership qualities, you’re better off as a female in the elephant world. It’s the females who stay together and it’s a female who leads the herd. If you’re a male you’ll be kicked out of the family circle sooner or later and you’ll be only allowed to visit when the females want you to. But you can go out and join some other guys and push down a tree or two to make yourself feel better.

The significant fact is that these rather different outlooks on life are packaged in the same way, just as happens in many other spheres of society. We may believe different things, but we must do the same things, follow the same routines, participate in the same practices. It is no longer meaning, no longer consensual representation, which binds the members of a society together, but common practices, procedures, genres. This is what Zijderveld (1979) called the ‘supersedure of meaning by function in modernity’. Meaning loses its bearings and becomes fragmented and heterogeneous. Practice, what people do, becomes more regimented, homogenized and proceduralized. In universities, for instance, a large variety of discourses is permitted. There is in fact no longer a need for unifying doctrine and belief to guarantee the cohesion of the institution. But there are increasingly many procedures to be followed: academic handbooks, prescriptions for the organization and presentation of courses, guidelines for the grading of students, all formulated without reference to the content of the courses or to what it is that is being graded, all supposedly applying to anything from a course in nursing to a course in nuclear physics (cf again Fairclough, 1993 and 1996). Or, to take another example, the idea that radio broadcasting would strengthen
the unity of the nation and help create a ‘common culture’, a fundamental aspect of the Reith doctrine and also of propaganda in the totalitarian states of the 1930s, has long ago lost all credibility. Radio (and now also television) has exploded into a multitude of different stations, all catering for different kinds of music. The programme formats however have become increasingly similar: everywhere the same alternation between short ‘grabs’ of talk and music, everywhere the same segments – the ‘breakfast programme’, ‘housewife time’, drivetime’ etc. (cf. Van Leeuwen, 1991) and this quite irrespective of any actual variety in practices (shiftwork, gainful employment of married women, use of public transport). Everywhere there are fewer (and more powerful) genres and more (but less powerful) discourses. Everywhere there is generic homogeneity and globalization and discursive heterogeneity and localization - the guide interface is just one of the ways in which this broader principle of social organization can be realized.

But there is yet another consideration. This discursive heterogeneity is only found in the spoken text. The twelve guided tours ultimately all use the same written text. It is exactly as the designers of the original guide interface put it, there is ‘a central factual nuggets of names, dates, places, with a constellation of points of view around it’ (Oren et al, 1990: 37). This means that we have, in the end, not only generic homogeneity and globalization, but also, still, a deeper, underlying semantic homogeneization and globalization, indeed ideological homogeneization and globalization - the problem is that this is not easily visible. Ideology has gone underground. Only snippets and fragments emerge, to be immediately recontextualized and incorporated in the contexts of different guided tours with very different surface ideologies. But these fragments are not themselves changed by these multiple uses and they still say what they say, they still provide an underlying and ultimately coherent ‘global’ meaning system on which the different tours must necessarily feed, and which they must always again make compatible with ‘local’ meaning systems such as Aboriginal Dreamtime stories or certain kinds of feminist discourses. As my examples have hopefully demonstrated, this global meaning system overwhelmingly concentrates on genetically determined inequalities, on merciless competition, on aggression and on struggle for survival. Its vocabulary, moreover, introduces so many implicit comparisons with human society (‘kiss and tell’, ‘keep in shape’, ‘leadership qualities’, ‘single mothers’, ‘join the other guys’, etc) that there can be little doubt as to the ultimate symbolic and legitimating function of these ‘core facts’.

In this paper I have attempted two things. First I have attempted to explain the structure of a particular interface, a particular genre of interactive text, and I have suggested that the structures of interactive texts are modeled on, and can themselves provide models for, modes of social interaction.
It follows that interactive texts aimed at children do not just provide ‘edu-
tainment lessons’ in the subjectmatter they deal with, but can accustome
the child to certain designs of textual and social interaction. The second
thing I have attempted, therefore, is to bring that ‘hidden curriculum’ out
into the open. It would be easy to draw a negative conclusion: heteroglossia
and localization are only skindeep. Ideology has not disappeared, it has
only gone underground. But we can also look at it more positively. The
attempt to allow readers to choose their guide, and to explore a field from
multiple points of view may here not have been altogether successful. But
that does not mean that it is not an important and interesting idea, the kind
of idea that might be vital for social life in multicultural societies. It only
means that there is a lot more work to do before this idea becomes fully
realised rather than just simulated.

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This article presents technology for use in teaching German. First there is a short historical overview of computer-assisted language learning (CALL) and a demonstration of the possible use of the Internet in language teaching. The remainder of this paper presents a textbook for business German and how technology can be used to support the learning of business German.

Computer-assisted Language Learning

CALL has had a relatively short history commencing approximately 30 years ago. It can be divided into three distinct periods which Warschauer refers to as behavioristic CALL, communicative CALL, and integrative CALL. These phases are not distinctly separable; they flow together which results in one phase overlapping with the new. None of them have been accepted in one great wave but rather slowly and unevenly (Warschauer 1996).

The first phase of CALL, behavioristic CALL, was conceived in the 1950s and put into use in the 1960s and 1970s. It was based on behaviorist theories of learning which were implemented in language teaching as the Audio-lingual Method. In this approach, drill and practice were the vogue. This lent itself beautifully to the implementation of the computer as a tutor (Taylor 1980). The rationale behind this was as follows:

+ Repeated exposure to the same material is necessary and even beneficial to learning
+ The continuous presentation of the same material is no problem for a computer. It does not become bored with repeating the same actions again and again.
+ The presentation of such material on an individual basis is a simple matter for a computer; this allows students to proceed at their own rate.
This form of CALL was upset in the late 1970s and early 1980s by a change in approaches to language teaching at both the pedagogical and theoretical levels. With the development of microcomputers, a completely new realm of possibilities became available. This laid the basis for the next phase of CALL.

The basis for the second period of CALL, Communicative CALL, was the communicative approach to teaching. This phase emphasized authentic communication that the drill and practice programs were unable to accomplish (Underwood 1984). This form of CALL stressed:

+ focus on the use of forms rather than the forms themselves,
+ teaching of grammar implicitly not explicitly,
+ the production of authentic utterances rather than the manipulation of prefabricated ones,
+ avoiding directly telling students they were wrong but yet being open to a variety of student responses,
+ the use of the foreign/second language exclusively and the creation of a foreign language environment that felt natural, and
+ doing that which books could not.

During this period, there were several types of programs developed. The first was a variety of programs to provide skill practice, but not in a drill format (for example, paced reading, text reconstruction, and language games). The second type used the computer as a stimulus (Taylor & Perez 1989). The purpose of this was to stimulate discussion, writing, and critical thinking. The third type referred to the computer as a tool (Brierley & Kemble), also called the computer a workhorse (Taylor & Perez 1989). Here the programs did not necessarily deal with language teaching material but allowed students to use or understand the use of language (for example, word processors, spelling and grammar checks, and desk-top publishing programs). The use of this form of CALL was ad hoc and disconnected in manner, and Kenning & Kenning (1990) believe this resulted in its not contributing to central elements of language teaching.

The third phase of CALL, integrative CALL, is just coming of age through the developments of multimedia computers and the Internet. The advantage of multimedia technology is in its variety (text, graphics, sound, animation and video) which can be accessed on a single machine. However, multimedia technology is only a partial contribution to integrative CALL. This technology allows for the integration of skills like listening and reading, but it rarely integrates meaningful and authentic communica-
tion. This is, however, possible through the implementation of the Internet (Warschauer 1996). One reason for the reassessment of the communicative approach for language teaching was the desire for a more integrative manner in teaching and has led to the use of task- or project-based approaches to language teaching (Warschauer 1996). These task- or project-based approaches can be remarkably well applied to teaching using the Internet.

The utilization of integrative CALL in textbooks for teaching German is in its initial stage. Various book publishers in the United States have started including web sites in their ancillaries for beginning German textbooks. However, these web sites normally are mere reproductions of the workbook.

**Deutsch im Berufsalltag**

This textbook project is unique to the market because of its structure and content. It consists of a storybook (the textbook), a workbook and a Web site. The storybook is a culture book about everyday German business culture. This is presented through the experiences of an American doing an internship at a fictitious company in Berlin. These experiences are presented in dialogues made for reading or through listening comprehension exercises which are followed by cultural explanations for German business. The workbook consists of grammar explanations and exercises, additional culture explanations (not found in the storybook) and culture exercises for culture information in the storybook and workbook. The Web site consists of additional culture readings and activities with links to other relevant Web sites. Some of the very special features of this Web site are as follows. When students are reading a culture item, they are able to highlight an unknown noun in the text, and the following options will occur (see Figure 1). “Artikel“ provides students with the correct gender of the noun, “Mehrzahl“ with the correct plural form, “Bedeutung“ links students to the glossary on the Web site for the correct meaning. If students choose “Grammatik,“ they are linked to a grammatical explanation for the use of that particular word in that particular environment in the text.

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<th>Mehrzahl</th>
<th>Bedeutung</th>
<th>Grammatik</th>
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*Figure 1: Option frame*
In the case of verbs the options only include “Bedeutung” and “Grammatik”. If students select “Grammatik”, they are given the options of “Konjugation” or “Zeit.” Choosing “Zeit,” students are linked to the correct explanation for the tense of the verb in this particular environment. The same applies to all other grammatical forms: adjectives would be linked to explanations about comparative/superlative forms or about adjective endings; conjunctions would be linked to explanations about how subordinating or coordinating conjunctions are used.

An important feature found on the Web site for this project is the various Internet exercises. Each unit has at least two different Internet activities which pertain to the business culture topics discussed in that unit. All of the activities are task based in nature and conform to Lee’s (1999) definition of what a task is and to its implementation in the foreign language classroom. Each exercise is linked to an online German/English business dictionary. The following Internet exercise is from this book project.

**Büromöbel**

The purpose of this activity is to familiarize students with the description of office furniture and equipment they have already learned in class. Students are given the task of furnishing an office. They imagine that they are an office decorator furnishing a client’s office. The client is limited to a 2,500 EURO budget and cannot go over in price. But the client must have certain items in her/his new office. Students are given the following worksheet to fill out for this exercise.

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**Internetübung**

http://www.otto.de


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**Endsumme**
After completing the Internet exercise, students then draw their office filled with the articles they bought from the online catalogue. In class, each student presents her/his picture and explains why certain things are located where they are. After which the class should be free to ask questions about the picture and discuss the set-up of an office.

**Conclusion**

Technology has become an important element in teaching a foreign language. It provides many advantages to teaching, such as the examples for various links presented for the Web site. Moreover, the Web has become an important source for authentic cultural information that can be easily integrated into textbook use through the Internet. For foreign language instruction these developments (Web sites and the use of the Internet, for example) are very valuable because of the multitude of types of activities and information that is accessible to the student seeking cultural information. Through the examples presented here, the teacher can provide students with interpersonal, interpretive and presentational skills, which Lyman-Hager and Burnett (1999) consider to be essential in working with computer based instruction.

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CD-ROM as educational text in technical and vocational training

Educational texts in technical and vocational training aim traditionally at both understanding and action. The updated technical handbook or booklet, commercial published manuals, technical prescriptions and illustrations are important knowledge sources for accomplishing professional tasks by craftsmen (Matt 1983; Mårdsjö 1992; Cronbach 1955 i Høie 1999; Mjelde 1998; Askerøi 1999a,e).

In addition to knowledge, the hallmark of vocational texts is still their turn over into immediate action by pupils. What pupils perform in practice, and what they express orally or in written form, is generally regarded as equally important for their learning by Norwegian technical and vocational teachers (Askerøi 1999b,c). Many textbooks are treated as books of reference (Askerøi 1999b; Berg 1996; Høie 1999), and pupils are accordingly encouraged to use them for private study (Askerøi 1999b,d).

Teaching aids which combine updating on the Internet, textbook and chat groups are mostly developed for general subjects. Databases in technical and vocational branches that renders access to in depth information on historic aspects of a trade, old or traditional techniques, theory, research and value questions, or subjects which borders other branches are still to be developed.

The promising aspects of ICT are access to more information than any human can handle, accordingly we have to learn how to make proper selections and to create new knowledge with the assistance of a rapid changing technology. The assertion that new electronic tools will not demand less human genius than formerly as the ability of humans to treat problems not defined in beforehand is superior to what ICT can solve (Wiener 1964), still seems to hold firmly. But how well are pupils prepared to make use of the wide array of learning possibilities with ICT? What are the cognitive demands on both teachers and students? These questions are illuminated below, partly through an assessment of the qualities of- and experiences with a CD-ROM programme on car electronics.
Development of knowledge through use of ICT, presupposes computer literacy in a broad sense. Kerr 1989;1990 underlines that electronic text has a different metastructure than traditional text (print), visual literacy is therefore needed to uncover the producers aims and manipulations. Already McLuhan (1964) suggested that pupils should learn how to access the graphic and photographic world as much as the typographic. Kerr (1989) compares CD-ROM programs with motion pictures, video and newspapers, which presents us with an edited reality. To grasp the roots, function and ideology of media, especially the rhetoric language of each media, Zindovic-Vukadinovic (1998) defines media literacy as the ability to understand and evaluate in a critical way media messages, to use and to create media messages and to adopt an autonomous critical study towards media.

The concepts of “media” and “visual literacy“ focus on mental habits to search for, sort out and evaluate what information is relevant and valid, and to use the obtained information critically. A decisive tool here is probably ones own language employed, including vocational concept understanding, in interpreting ambiguous information in pictures and texts in the world of ICT.

Clark 1994; Hartley 1999, point out when all other variables are controlled, the media used to deliver instruction have little impact on achievement. Along the same lines Kerr (1990) states that what motivates learning is not the medium itself, but the educational quality in the material and the totality of the learning activities. For teachers the challenges to see to the quality in the information offered can be formidable, as the information presented on one single CD-ROM might be analogue to the content of whole dictionaries.

Additionally teacher’s roles in developing their own teaching aids are challenged by available electronic texts. Only a few teachers have sufficient knowledge to utilise these technological possibilities themselves (Kerr 1989). But their knowledge on how students learn a trade, not at least through action or laboratory work simulating action, is needed for partaking in development of software, educational tools and course planning or programs for WBI.

Assessment of a CD-ROM programme on car electronics

In a case study, teacher’s ways of dealing with educational texts, organising their learning activities and pupils report of their learning experiences, were studied. Two teachers and 30 pupils in 2 classes at 2 different Norwegian upper secondary schools were interviewed on their use and assessment of a CD-ROM programme on car electronics (Universitetsforlaget 1996).
Only 6 of the 30 pupils mentioned that the programme had affected their learning (Askerøi 1999d). This seemingly poor learning outcome could be due to the qualities of the CD-ROM programme, their own learning abilities, or computer literacy, their ways of reporting and answering on interviews as well as teachers ways of organising their learning activities.

### CD-ROM programme on car electronics tried out by two teachers

<table>
<thead>
<tr>
<th>Aims</th>
<th>Teacher JE (TJE)</th>
<th>Teacher T (TT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relate subject to what</td>
<td>Want pupils to seek out knowledge</td>
</tr>
<tr>
<td></td>
<td>pupils have learned earlier.</td>
<td>themselves, and to cooperate two</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and two in problem solving.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Presuppositions for use</th>
<th>Pupils must know how to deal with a PC. CD-ROM presupposes knowledge pupils do not possess.</th>
<th>Pupils must know how to deal with a PC. Teachers must motivate pupils to ask questions that could be answered by the use of CD-ROM.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mastering of vocational concepts.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organisation and Use</th>
<th>TJE selects pictures from CD-ROM, and makes copies that pupils might make notes on (adds up to a small &quot;compendium&quot;). Tasks solved in full class, demonstrated by individual pupils using the mouse on a big screen. Repetition in full class.</th>
<th>TT gives individual counselling on the use of CD-ROM. &quot;Trial and error&quot; by individual pupils. Self study of CD-ROM related to study subjects. Reluctant to install a big screen, sees a possible pacifying effect (associated with traditional class room teaching).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As pupils mostly are used to textbooks, TJE provides in addition illustrations from the CD-ROM.</td>
<td>CD-ROM used as supplement to textbooks and other sources (models, plates, overhead transparencies).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relation to textbooks</th>
<th>Too difficult for the pupils.</th>
<th>TT sees disadvantages; low print quality, few animations can be manipulated. Unstructured subjects, no self instructional tasks. Pupils are easily bored, the programme could lead to more passivity; as soon as a problem is solved, the solutions is passed on to the other pupils. Advantages; functions based on ones own calculations and animations can be manipulated. Several senses activated simultaneously, which serves learning. Pupils can differentiate their own learning.</th>
</tr>
</thead>
</table>


The two teachers seemed to use the programme in distinctly different ways, which can be summarised as seen on the further page.

The interviews further show that TJE and TT believes the pupils need more training to take advantages of what the programme can offer, that only a few aspects of the important subjects are covered, and that it therefore has limited utilisation for them.

The traditional way of treating textbooks as books of reference among technical and vocational teachers, coincide with the way TT treats the CD-ROM programme on car electronics; as a source of reference. TJE on the other hand, with a similar attitude to textbooks, follows the content of the CD-ROM programme as an extension of the textbook, or as something (like in the textbook) the teacher believes he should transmit to the pupils. TT encourages pupils to investigate the programme for themselves, and “sits by” for information or counselling. TJE keeps the class together around the big screen, and search out himself what the pupils could make use of for task solving and repetition (Askerøi 1999f).

In a pilot study on competence at Volvo’s vocational training school (Sweden), Sandberg (1994) found that teachers hold two different conceptions of vocational training:
– directing, where the teachers conceived their teaching work as being about directing and managing the students’ process of learning, and
– supporting/advising, comprised the view that the teachers should support and advise the students on their own learning.

Accordingly, teacher JE demonstrates a belief in directing the students learning process, contrary to teacher T’s belief in supporting and advising his pupils in their own learning.

7/10 of TJE’s pupils had mainly copied pictures for repetition, 13/20 of TT’s pupils had used it mainly in solutions of tasks or to look for answers. There are corresponding answers between teacher and pupils in two different classes. So far, these results indicate that for most of these pupils, the totality of the learning activities as well as their teacher’s instructions on how to use the programme are equally important for their learning outcomes as the mere use of the media itself.

Although the entrance level to use a PC is not too high, research shows that a self instructional teaching aid on PC not automatically gives the user the full range of learning possibilities it offers (Caroll and Mack 1987). In our teachers, as well as their pupil’s opinions, these pupils did not have enough knowledge and experience to take full advantage of the CD-ROM programme. TJE also mentions mastering of vocational concepts as a presupposition for learning. These pupils way of dealing with the programme
after a few months of use indicates that “computer literacy“ might play an important role for their learning outcomes.

Technical and vocational teacher’s knowledge of their trade and of teaching both vocational theory and practice is important in development of CD-ROM programmes designed for technical and vocational training. TT wants for instance to cooperate with publishers, firms and schools for further programme development. It is probably equally important that teachers learn to burn CD-ROMS themselves, to continue to keep up with the traditions of producing teaching aids on their own in co-operation with their pupils. How well are we able to give teachers the necessary infrastructures to keep up with ICT? Do we want the teacher’s role in producing teaching aids to be overtaken by others?3

**Literature:**


Mårdssjø, Karin (1992): Technical Writers´ Image of their Audience; Word Processing and Microwave

Notes

1 The importance of developing vocational concepts and a professional vocational language in vocational training, is dealt with in Askerøi 1998; 1999e.

2 In a research project (1996-98) on the use of text books in technical and vocational training, Mette Høie and I interviewed 14 technical and vocational teachers repeatedly through a schoolyear and 116 pupils, as well as text book authors and editors. Our interview results do not stand for generalisations up to this point, they are meant to generate and illustrate areas for more extensive research (Askerøi and Høie 1999).

3 In connection with the Norwegian Reform-94 in the upper secondary school and new curricula, technical and vocational teachers were widely employed to write new textbooks in all their subjects.
The status of educational texts in a vocational learning process

Introduction

Norway has a long tradition for national curriculum and for textbook evaluation and certification. The criteria for evaluation are based on research from the areas listed above. With web-based curriculum this practice of central quality control will no longer be feasible. So far the focus has been on finding ways to stop pupils access to harmful information through the Internet. This has been a question of sorting out, what criteria to use, who will decide on the criteria and procedures – not a question about the quality of what gets through.

Using hypertext means entering a "bottom up" process choosing your own connections and sequence, as opposed to the "top-down" process of a traditional textbook. The user becomes his own gatekeeper: finding, sorting, choosing between roads of information, keeping up with the possibilities. The Norwegian author Jan Kjærstad (1997, p. 245) compares reading a hypertext to moving around in a city which is constantly changing: main streets connect with side streets, side streets with narrow paths, and what was a path last time you were there, may suddenly have become a main street and so on. The kind of understanding gained from a hypertext is in the choice of streets as much as in the actual texts. And the expectation is that an understanding of the whole will emerge in the readers head, "bottom-up" from the combination of the different pieces of text. The interactive use through hypermedia is expected to stimulate individual search for knowledge, different choice of content, different pace and a variety in pupils’ construction of knowledge.

The tradition of quality assessmen of Norwegian textbooks will have to be replaced by the individual learners ability to construct knowledge or post-edit the hypertext. In this paper I will argue that the development of metacognitive strategies constitutes a major challenge for pupils as well as for their teachers.

Mette Høie
Skills needed for the use of electronic texts

In 1985 Postman wrote ”Amusing Ourselves to Death. Public Disclosure in the Age of Show Business”. He claimed that we had left the ”the Age of Typography” and entered ”The Age of Television”, and that visual and oral communication had replaced much of the text-based communication. He could not then imagine that the next generation of media would be both text-based and interactive. In ”Growing up digital. The rise of the net generation” (1998) Tapscott points out that there has been a shift from one-way transfer from TV and video (broadcast) to interactive use of electronic media.

To watch a young boy, who never even writes a postcard, communicate on e-mail with friends around the world, in English, Spanish or Norwegian, to watch him setting up a homepage, joining in on chat-groups – writing, reading - in short spending so much time on texts, gives reason to reflect. Under the supervision of teachers in the upper secondary school he does what is necessary, not any more. The responsibility to portion out knowledge at a speed and at a level that will see him through his final exams, is placed with the teacher – and it works with minimal engagement on his own part. This could be the story of any young boy, a story of instrumentalism – he does what it takes to reach his own aims. If the teacher tried to supervise his Internet activity to work for curriculum objectives he would perhaps not find it any more exciting than a visit in the school library.

A German boy of 14 captures the essence of this:

"At home you can do what you want with your computer. If you wanna go surf the Net, you can do that. At school you can’t simply ”do” something, you have to be ”educated” how to do something. And you certainly can’t decide what you wanna do.” (Tapscott 1998, s. 129)

The need for autonomy and the scepticism as to what adults have to contribute becomes clear in an interview with Daniel Franck after his world championship (Aftenposten Aften, 28.1.991) on snowboard:

“We have not forgotten the play. On snowboard you do not meet middle aged men who scream what the young people should do and how. On the board we do what we like.”

and he adds:

"Snowboard is youth. Youth is the future. All other athletic disciplines have a hard time recruiting young people, to snowboard they come in rows.”

This sounds like youthful arrogance, still I think we should pay close atten-
tion to their experience to reflect on the new teacher-challenges in the future. Tapscott (1998) describes the birth of a new generation influenced by the digital media. This generation in 1999 is between two and twenty-two years old, and consists of those who have been raised with computers and are familiar with them. The time spent on the Internet is not passive time, it is used for reading, exploring, developing skills and solving problems:

"By necessity, cyberspace has become an N-Gen playground and hangout. It is a place where they play and have fun.” (op. cit. s.8).

Tapscott (1998) claims that the N-Gen will have the following traits:

- they are participants more than onlookers
- the children’s curiosity to investigate the new media do not replace their getting their own experiences
- they make easy shifts between different ways of communicating with others
- they get used to evaluating different opinions
- they develop self-confidence on their own needs and wishes
- they develop new ways to relate to information
- their identity and subcultures are influenced by the global communication network.

Like with the first textbooks it is again the chosen few who will have access to computers and the Internet, N-Gen consists of a tiny part of the world’s population of children and youth. Tapscott (op.cit. s.12) refers to Negroponte 1997: “More than half of the 1.2 billion children in the world aged six to eleven have never placed a phone call.” And I will add that they have not even access to textbooks for their primary education.

The advantages of web-based and other digital materials – rapid updates, interactivity, customization, audio, animation, and sometimes even lowered production costs – have led many educators to view them as attractive alternatives to traditional texts (Axelson M. and L. Hardy 1999). Hyper-text, just like printed text-books did, dramatically changes the role students, teachers, tasks, evaluation, syllabus will have as well as the relation between the individual teachers, courses, departments and disciplines. The technology is addressing the needs of classrooms that have moved from teachers – led to student-initiated exercises, from individual to cooperative learning, from strict grade and subject boundaries to interdisciplinary work that might involve students of various ages and abilities. Landow (1992) gives
an interesting survey of the importance of texts in education from a hyper-text perspective. Maybe the most scary aspect is that hypertext answers the teachers prayers for active, independently thinking students who take more responsibility for their education and who are not afraid to challenge and oppose. The problem is getting what you asked for and then what… he says.

Kolb (1984) comments on the growth of educational technique designed to assist the learning process: ”The weakness of nearly all these techniques is the failure to recognize and explicitly provide for the differences in learning styles that are characteristic of both individuals and subject matters. Even though many of these educational innovations have been developed in the name of individualized and self-directed learning, there has been little attempt to specify along which dimensions individualization is to take place. … Little has been done to provide the individual learner with branches that provide alternative learning methods (such as pictorial verus symbolic presentation) based on the person’s learning styles or the type of subject matter being taught.”

The perspective of individual learning styles is important in an Internet context. The interactive use, the search for information and the construction of knowledge implies a categorical shift in cognitive strategies. The textbook is a structuring of knowledge, and we conceive earlier knowledge, the concepts and structure of school disciplines as cognitive maps that enable us to learn new subject matter efficiently. One question is whether previous knowledge is necessary or useful to navigate the net – i. e. is some ”top-down” learning necessary before we are able to start ”bottom up” learning so to say.

To become their own gatekeepers pupils need to develop metacognitive strategies, Tapscott claims that the Net-Gen develop such skills as they explore the possibilities. A Danish report ”Borderless education” (http://www.uio.no/~mortenso/) suggests that Internet-based education demand qualifications and competence like:

1. A high degree of self-discipline, from external to internal control when the teacher is not in the room, the ability to take responsibility for ones own learning.
2. The ability to have an overview over what is to be learned and to decide how to structure it
3. The ability to evaluate the use of time and monitor own use of time.
4. The ability to take advantage of the free choice of methods.
5. The ability to choose materials.
6. The ability to formulate own objectives.
7. Flexibility and ability to adjust.
8. Independence and initiative.
10. The ability to co-operate and take social responsibility in a project.
11. A developed ability to search and sort out large amounts of information.
12. International competence – language skills and the ability to relate to different cultures with respect and understanding.

This list of qualifications or "entry-competence" for Internet based education mirrors quite a few of the objectives in the national Norwegian curriculum – these are qualifications young people are expected to develop throughout their upper secondary education. In the national curriculum these metacognitive strategies are considered crucial for the pupils to take responsibility for their own learning.

I have experienced how challenging the development of such qualifications are for myself and my student teachers. In our case studies (Askerøi / Høie 1999) we found that the development of such skills – regardless of Internet – constitute a major challenge for teachers and pupils. Developing metacognitive strategies along with the knowledge of subject matter turns out to be simply too much for a large number of pupils.

**So what about the status of texts in technical and vocational education?**

Technical and vocational education has, seen as a whole, a strong tradition for the use of manuals and technical encyclopedias, while the tradition for the use of textbooks is weak both in the upper secondary schools and in on the job training – programs. Many technical and vocational teachers have educated their pupils with little assistance from written texts. They have themselves learned their trade largely through a practical approach combined with oral instruction. The content knowledge, the skills and concepts develop through solving actual tasks, trying out, following and adjusting instructions, finding out through looking in manuals, asking the teacher, cooperating with fellow pupils/workers.

By the middle of the 1990ies for the first time all the vocational areas of study in the upper secondary school in Norway got textbooks. The new books entered a more or less textbookless tradition, where the pedagogical content knowledge (Shulman 1987) of technical and vocational teachers had been based not so much on texts as on the the learning process in workshops assisted by models, equipment and manuals.
In our research project on the development and use of textbooks in the vocational areas Askerøi and I (1999) found that vocational teachers are pleased with the new books. For the first time they even have a choice between different textbooks, but they are not too sure about which criteria to choose by. They have not had any training during the teacher education as to the use of textbooks, and tend use them like manuals. They plan and carry out their teaching on the basis of their own experience, adjusted by the formal curriculum, more than on the textbook. Their assessment focuses on the relevance of the textbook’s presentation of the vocation and its tasks to qualify their pupils for worksituations. The idea of being governed by the textbook is unfamiliar to them.

It turns out that being written by experienced technical and vocational teachers several of the new textbooks are based on and follow a well tried workshop progress. The strong tradition in vocational education is based on experiential learning (Dewey 1938) where the understanding of practical problems and automatization of necessary skills demand theoretical and practical learning processes to be interwoven. The pupils learn mainly through practical exercise, and during the gradual development from pupils to skilled tradesmen the learning process in the workshop remains central.

As shown this has been the case regardless of textbooks, and the use of CD-ROMS and Internet will probably fit in as yet another means to gather information. In some areas of technical and vocational education Internet is already as important as manuals and technical encyclopedias, in other areas it has not yet been put to use. Several vocational areas like electronics, mechanics, chemistry, weaving, nourishment etc. have used commercial computer simulation models for years, many technical and vocational teachers have been making their own CD-ROMs to use with their pupils, and a few CD-ROMs are in the process of being tried out by their publishers. Askerø's paper about the use of a CD-ROM for car electronics sums up some experiences. The National Centre for Educational Material is building up a variety of electronic teaching material, but so far very few are made specifically for the vocational areas.

To sum up – web-based curriculum will probably fit in nicely in many technical and vocational teachers' pedagogical practice. The continuing challenge for these teachers is to be aware of and able to analyze pupils' different learning strategies, to assist their learning of subject matter, their development of vocational skills and their metacognitive strategies.

The enthusiasm accompanying hypermedia is refreshing, like the textbook in its time, this technology will influence the organizing of education. The important challenge for formal education is to make very good use of the promise by assisting pupils in developing the necessary metacognitive
strategies. As teacher educators and researchers we need a better understanding of these processes and how to assist them. I think a very interesting field of research will be individual learner's construction of knowledge, Internet in the learning process. To develop relevant knowledge, we have to work closely with practising teachers, and most of all we need to listen carefully to what kind of questions and problems the N-Gen generates as they post-edit hypertext.

References


Part 2

Values, Attitudes and youth Culture
Can training change attitude?

Lessons to teach children to eat healthily. Instructions for a management team to be more cooperative. A training to raise the economic awareness of employees of a big company... Here are some examples of training courses in which 'developing a specific attitude' is a main purpose.

Instructors and trainers are regularly asked to develop such courses. At first sight, the examples above seem to be at the level of providing information or training in skills. Tell children which food is healthy and teach them to make a good choice, and they will eat healthily. Give managers instruction about the importance of being cooperative and some training in teamwork, and they will be good colleagues. Show employees how to calculate their proceeds, and they will work economically... Or not...?

It is common knowledge, that one's conviction or mentality is also of great influence on whether one behaves as desired. Training should therefore have attitude-related goals. Raising the level of one's knowledge is not the main purpose, nor is training in routines. The main objective is to pay attention to a mixture of goals in order to change attitudes.

What is ‘attitude’?

To define ‘attitude’, I use the definition of Krathwohl, Bloom and Masia (1971):

"Attitude is a complex of personal characteristics, norms, values, feelings, ideas and meanings, that determines how one behaves in a specific situation."
For several decades, competing theories of human behavior have tried to clarify the mechanisms that control human behavior and attitude. The subject of cognitive approaches, like information processing theories, is the rational part of attitude. Theories emphasizing operant conditioning and modeling (social learning) focus on explaining attitude from the level of reflexes and routines. Theories emphasizing the classic conditioning, as well as theories on human emotions, clarify the mechanisms that operate at the level of emotions, drives and instincts.

Nowadays, educational theories however state that these theories should no longer be considered as competing schools of thought, but theories which each cover different parts of attitude. Attitude includes cognitive, behavioral and emotional elements. Cognitive elements are about getting/giving information, behavioral elements about training skills, and emotional elements about stimulating feelings and commitment. Each attitude is therefore considered as a mixture of three aspects:

– knowledge: knowing and understanding what behavior fits in a specific situation, and why;

– behavior: being able to exhibit the desired, appropriate behavior;

– emotions: being aware of the feelings and emotions that underlie the behavior.

These three aspects do not play an equal part in each attitude. Nevertheless the approach in any training must be along the lines of these three aspects. Which aspect has to be emphasized, depends on the attitude aimed at.

**A three-fold approach**

_Three distinguished, but not individual parts_

Given the three aspects of attitude, training should have a three-fold approach.

– The knowledge-oriented part is concerned with providing information on the attitude aimed at. Cognitive processing of this information is a central theme. The information is always about the attitude in question. For example: What is client-mindedness? Why is it important to be client-minded? What types of client-mindedness can be distinguished? What are the advantages and disadvantages of each type

– The behavior-oriented part is about training in specific skills or parts of skills. The executed skills are observed and analyzed by the trainer and, if possible, the trainee.
In the emotion-oriented part of training, the goal is to penetrate to the emotions and feelings that underlie the specific attitude of a trainee. If these underlying emotions or feelings can be changed, the newly learned attitude will have a much stronger base. In the emotion-oriented part of training, methods may be used that personally affect trainees. For example: confrontation with one’s own positive or negative feelings, experiencing positive or negative consequences of specific acting, or discussing moral dilemmas.

The three approaches can be distinguished, but cannot be seen as separate parts. In practice, it appears to be a matter of emphasis, a question of choosing the correct starting point.

Various starting points

The starting point for training (focus on knowledge, behavior, or emotion) can vary.

For some attitudes, it is not difficult to indicate whether knowledge, behavior of emotion should be the starting point, or rather the point that is accentuated most. For example:
– Current attitude: resistance to a new production process, only because people are unacquainted with it.
Starting point of training: accent on knowledge.
– Target attitude: act environmentally sensible, such as separating waste or being careful with one's resources.
Starting point of training: accent on behavior.
– Target attitude: flexibility, ambition, defensibility.
Starting point of training: accent on emotion.

For other attitudes, training can be worked out in several ways. See the following example:
In an organization, young managers need to be trained. The purpose is to induce in each manager a style of leadership that fits his/her personality, and that is appropriate to the department in each case. This training can be worked out in two manners: knowledge-oriented or behavior-oriented:
– Knowledge-oriented. Possible steps in training:
  – Read a text about different styles of leadership.
  – Group discussion, guided by the trainer.
  – Observe different styles of leadership on video tape.
  – Reflect on your own style of leadership.
  – Indicate the desired style of leadership for each person.
  – Exercise the specific (parts of) skills required.
– Behavior-oriented. Possible steps in training:
  – Observe the model behavior belonging to each style of leadership.
  – Experiment with these different styles by using a checklist.
  – Participate in a presentation about styles of leadership.
  – Reflect on your own style of leadership.
  – Train the specific (parts of) skills required to improve or change your own behavior.

Which training is best? A knowledge-oriented one, a behavior-oriented one, or maybe an emotion-oriented one? This depends on the specific situation and the starting position of people that follow the training. Some examples:
– When people feel much tension or stress at work or feel unable to solve a problem, it may be sensible to use an emotion-oriented training. At the start of the training, people can ventilate their feelings and clear up the air. After this, they are often more receptive to new thoughts and new habits.
– When trainees have a fear of failure, you can start by giving some simple practical exercises, in which they are likely to succeed. Success feels good and reassures people, which means that the next exercises will go better.
– Sometimes people must unlearn an old habit before a new one can be learned. We know that unlearning an old habit works best, if people find out how the disadvantages will affect them. So, at the start of the training, you should confront your people with the consequences of their behavior. This is much more effective than just telling them what to do, or why it is important to do so.

A theoretical base to change attitude

So far, change of attitude is described from an educational point of view. In addition to educational theories, more (psychological) theories may provide suggestions as to how to handle questions of attitude. Besides choosing a particular starting point (knowledge, behavior, emotion), it is essential to choose a theoretical base to design an effective approach. Some examples:
– Personality psychology: A desired attitude is often closely related to a personal characteristic. A manager wants his employees to be client-minded, economical, or creative, while the employees have personal characteristics that obstruct these changes. In these cases, the employees must be approached and guided in an individual way. Insights from personality psychology may be useful.
Social psychology: Attitude may be a result of the social setting, and status within that setting. The attitude of an employee with an authoritarian manager will be very different from that of an employee with a manager who gives a lot of freedom. Young employees view their job differently in comparison to older employees. Making changes in the social context may influence attitudes related with to context. How are groups of employees formed, what is the style of leadership, what are the informal relations, how are people rewarded in an immaterial way? All these things may influence one’s attitude. The social context can be influenced through measures that concern communication, the constitution of the team, and leadership.

Psychology of moral development: In daily work, employees are confronted with many situations that are a sort of moral dilemma. Some examples:

- An employee must choose between a personal benefit and a benefit for the organization.
- A decision must be made, about which risk is acceptable for the company or the client.
- Ethical questions play a role in selecting a person for a vacant job…
- There are many psychological theories about moral development. Norms and values play an important role in this. To reach these norms and values, measures are necessary in the field of education, but also organizational measures, personnel management, or culture management.

Mass psychology: To change the attitudes of a large group (for example employees of a multi-national company), methods derived from mass psychology may be used. The same principles as used in large advertising campaigns may underlie such an approach.

Educational material to change attitude

'Parents: Present!', an example

At PLATO, we used the training concept as described above (= choose starting point + choose theoretical base) in educational practice. I shall give an example how we implemented this concept in educational material for changing attitudes. The project I will describe is 'Parents: Present!'. We call it 'a parenting training to support parents of persistent truants'.

When children play truant from school (which means: illegally stay away from school), there is quite a high chance that they will start a criminal career. Perhaps only a short career, but it may be also a lifelong career. In
order to prevent criminality, the Ministry of Justice in the Netherlands wanted to tackle the problem of children that play truant. However the Ministry also noticed the need to tackle the parents. It seems important to pay attention to the behavior and mentality of parents towards truancy. Sometimes, parents are no longer capable of motivating their children to attend school, or parents do not know how to handle problems their children have at school. For these parents, supportive parenting training can be helpful.

The idea of focussing on the parents, when the problem seems to concern children is not new. Parents can be fined when their child is not behaving according to the law, because parents are responsible for a child under age. And not attending school is illegal. Until now, parents could be punished 'only' in a financial way for their children's misbehavior.

Sometimes, parents keep their children from school e.g. to take a family holiday out of season, which is cheaper. In this case, truancy is called 'luxury truancy'. Financial punishment may then be suitable. Nevertheless, there are many more serious examples of truancy. They concern 'problem truancy'. This is, when truancy is caused by severe, underlying problems. In such situations, a fine is not very effective, since the underlying problems are not noticed and not solved. This all made the Ministry of Justice decide to look further for alternative ways of punishment. This led to the idea of a supportive parenting training course for parents.

In the training course 'Parents: Present!', support to the parents is intended to change parental attitudes. Parents have an attitude towards the truancy of their children, and since the situation has become problematic, this attitude seems to be inappropriate. If parents can change their attitude, they may contribute to a solution to the problem. Parents have to learn to handle the truancy problem more effectively.

As explained before, we think a three-fold approach is most effective in changing their attitude. Training should focus on three aspects:
1. emotion: sharing and discussing experiences and emotions that parents have with their children that play truant;
2. knowledge: give parents information about parenting and school;
3. behavior: introduce some useful nurturing skills to parents, and train them in the most important ones.

These goals are the subject in:
1. modules focused on experiences;
2. modules with information and training about parenting and the school system:
3. modules with information and training about parenting and the school system (partly), a module for coaching and advising parents, and a possible supplementary training course for parents. (The last one is not part of this training.)

Based on the training concept, the first step is to choose a starting point: should training start with emotion, knowledge, or behavior? Parents attending this training course have been experiencing a severe truancy problem with their child, possibly for a long time already. The situation may have escalated, alternative ways of solving the problem have not been successful. Most parents will feel sad, powerless, or angry. Airing these feelings, and perhaps noticing that others are in the same position, may help. So the starting point should be emotion: a module focused on experiences. After this, additional modules focus on knowledge or behavior. Which modules the parents will be in rather depends on their specific situation. During the intake interview at the start of the training, this is one of the points checked so that each parent will receive a (more or less) individualised program.

Following the training concept, the second step is to choose a theoretical base. Training is directed at influencing personal characteristics of parents. Some parents may be stimulated to be more concerned, more assertive, or have more contact with their child. Other parents may be stimulated to be more relaxed, keep more distance, or have more confidence in their child. Personality psychology offers assistance for this. Discussion, providing security, offering structure, and personal coaching are measures to be used.

**Intake**

The starting point of the training is an intake interview. The trainer gets to know the starting situation of the parents. He or she can indicate which modules are most relevant for these parents to follow. What is specific about their problem situation, and which modules are helpful in that case?

Some modules are obligatory for everyone. Others are optional. Whether parents will follow optional modules depends on their situation and specific problems.

**Modules focused on experiences**

The emphasis is on how parents experience the truancy problem. The main theme is to stimulate parents to share their experiences with others. Experiences must be made open to discussion. Problems and emotions, caused by these experiences, can be discussed. Experiences and problems encountered may include conflicts between parent and child, experiences with
school or authorities relating to requests for assistance, feelings of incapacity and inadequacy about handling the situation.

When parents share their experiences, little by little they may gain insight into what has gone wrong, and how. It is important for parents to notice they are not the only ones who have problems with a child playing truant. Parents will perceive that it can be helpful to share problems, and emotions relating to problems. It may be the first step in being able to cope with these problems and their eventual disappearance.

**Modules with information and training about parenting and the school system**

The emphasis is on knowledge and skills of parents concerning parenting and school. The first goal is to inform parents about these matters. The information is raised during meetings with the parents. It is discussed in various forms. Issues are: adolescents; effective parenting; where to go with problems with your child; to school for a future; how school is organised.

The second goal is to get some experience in some special skills. For example:
– parenting skills, like 'how to set limits for children' or 'how to communicate with adolescents';
– social skills, like 'how to get insight in school' or 'how to approach supportive authorities'.

Each module with information has an accompanying folder for parents. In that folder the basic idea of each meeting is explained briefly. Parents are given suggestions about how to work on the theme at home.

**Module for coaching and advising**

This module is the last one in the training course. Its main purpose is to evaluate the attitude of individual parents. What emotions, knowledge, and behavior do they have towards truancy at this moment (after following the training course)? The trainer gets an impression of this, and can advise whether or not parents should be given additional support (supplementary training) when 'Parents: Present!' is finished. In such supplementary training, parents can learn more specific parenting skills or social skills. These skills provide extra help to parents to solve their personal problems.

**Motivation**

Parents attending these training courses may possibly not be there 100% voluntarily. A judge has given them the choice: following the training course, or paying a fine. The trainer running the training course must be aware of this. It means, that parents might have negative feelings towards the train-
ing course. It is not possible to know for certain whether the parents think the truancy of their child is a real problem and are prepared to accept help to solve this problem or not. Motivation may be a difficult point, but it is too easy to think that motivation is a condition for effective learning. Motivation should also be an explicit result of training. It should always have the attention of the trainer. Working on motivation is an important aspect in training.

**Reflection**

To what extent can training change attitude? It is obvious that attitudes are relatively stable. Changing them permanently is impossible in a single training session within a short time. It is also necessary to think out ways of developing attitudes, of learning to follow them, and of maintaining them.

Working on attitudes is a difficult process that requires knowledge, insight in psychology, and creativity. The approach presented here provides ways of handling this process. This approach however is a theoretical model, whereas reality can be much more complex. The choice of starting point is not always clear-cut, mixtures of theoretical bases are possible, or people in training can be very different. Using the approach presented in more projects should demonstrate its practical value.

**Consulted literature (selection)**


Parts of this paper are based on several previous papers, articles and texts:


The research area on which I want to reflect lies within youth cultures in the 1990’s. In 1992 I started to look up hip-hop environments, interview youngpeople who defined themselves as hip hoppers and started experimenting with teaching by hip hoppers using their rap songs, rap music, music videos, dancing and clothes.

In experiments like these the pupils – or some of the pupils – become the teachers. The teachers and the scientists become ethnographers; we listen to and observe a foreign culture curiously. This way non-pedagogical texts – in the extended text meaning, wheremagazines, pictures and electronics media are texts – are introduced to the schools.

The research motive for me as for others who have worked with youth culture has been emancipatory. My motivation was to include drop outs, non-adjusted pupils in the school culture. By opening up for these pupil's interests and resources the wish has been to make them active participants in the school culture by making them players in the teaching situation. When the focus is on the hiphop culture most of the time the players have been boys aged 12-16. The paradox is that I am equally interested in the emancipation of the girls.

The what-how-why of didactics

In this connection educational texts in the electronic age are non-pedagogical texts which are being brought into educational contexts. What happens to these texts in the school context? What happens when the music video becomes an educational text?

When dealing with youth culture we are dealing with a leisure culture. This culture is different from the school culture; it is ”another culture”. Some people might argue that leisure culture and school culture are polarities and that leisure culture does not belong in the school. Others talk about leisure culture and media culture as ”the parallel school” (Morsy 1984).
What happens when leisure culture comes into the school? Is it transformed into "cultural capital" in the sense of Bourdieu?

With youth culture the extended text idea is being applied. How far is the school willing to go beyond the verbal and into the non-verbal?

In my research process I have been dealing with different theories and gradually I have been inspired by post-structuralistic theories and perspectives. I have tried to systematize different theories by using my view of didactics while trying to pin down methodologies.

I define didactics from the teaching of what they do to how do they do it and why they do it. Methodology is knowledge of theories and interpretation frames.

<table>
<thead>
<tr>
<th>Theoretical position</th>
<th>What</th>
<th>How</th>
<th>Why</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Semiotics</td>
<td>Analyzing (binaries)</td>
<td>Symptomatic (revealing)</td>
<td>Consciousness raising</td>
<td>Structures (basic, behind) (typical) (exemplary)</td>
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<tr>
<td>Marxism</td>
<td>Socializing (socializing)</td>
<td>Confronting (confronting)</td>
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<td></td>
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<tr>
<td>Feminism</td>
<td>Interpreting (dannelse)</td>
<td>Dialogical (for and against)</td>
<td>Understanding Coherence</td>
<td>To understand</td>
</tr>
<tr>
<td>Hermeneutical</td>
<td>Describing (dannelse)</td>
<td>Sympathetic (loyal) (keeping up)</td>
<td>Making visible</td>
<td>Empirical (repetition of reality)</td>
</tr>
<tr>
<td>Phenomenology</td>
<td>Discourses (situated)</td>
<td>Constructing (processes) (practice)</td>
<td>Interaction Orientation</td>
<td>Pragmatic/ eclectic Give and take</td>
</tr>
<tr>
<td>Constructivism</td>
<td>Breaking up undermining</td>
<td>Destabilizing</td>
<td>Liberate</td>
<td>Contingency (unpredictable)</td>
</tr>
</tbody>
</table>

**Historical development**

That youth culture has made it to the school curricula in the first place is due to theoretical and hermeneutical positions. It started with a radical culture criticism of the language in the mass media: the low readability indexes (lix), incomplete sentences and the use of cliches. Furthermore the substandard content was being criticized and the culture was called trivial culture, and was characterized by the escape from reality and theromantic,
schematic types (the evil/the good, villain/hero). Connected to cultural pessimism, where it is inspired by the old researchers of the Frankfort school (Adorno, Horkheimer).

With the marxism and feminism of the 1970’ there was a critical ideology turn. The criticism questioned the fake messages of the trivial culture. Now the criticism was concentrated on the interests of the capital and commercialization. We criticized the youth culture for concerning trade rather than utility value, Schein and not sein in the aesthetics of goods (Alhusser, Haug).

The critical position included also psychoanalytical inspiration, space which led to criticism of narcissism, egocentrism and regression in the young people (twisted use of Ziehe) and to criticism of the overdetermination sexuality (Juliet Mitchell).

I see the hermeneutical inspiration in the move towards interpreting aesthetics and fascination power of the youth culture. In the 1980’ the focus was on the potential and possibilities for sense related acknowledgements of the culture. Youth culture was being viewed as:
– a criticism of everyday life (the social historical view)
– appealing to fear and prohibitions (the psychological view)
– as a refuge into fiction (the escapist view)
– as the possibility to relieve one’s feelings (the catharsis view).

The source of inspiration can be Ziehe. Or “polyästhetische Erziehung”, which is developed at the Institut für Integrative Musikpädagogik und Polyästhetische Erziehung in Salzburg under the direction of Wolfgang Rošcher, if we take hermeneutical-critical positions.

When aesthetics is defined as sense related acknowledgements then poly-aesthetics will provide other and more sense related acknowledgements. There are five aspects of polyaesthetic pedagogy:

I also see the hermeneutical move in what I will call: the pleasures the motive power in teaching.

Here focusing is on interpreting the coherence of words, music, pictures, dance (Lindberg 1995)

With positions like the Critical and Hermeneutical and Hermeneutical-Critical I will argue that we are talking about:
– academizing and didactation: it is about analysis and interpretation concentrated on the pupils consciousness-raising and greater understanding;
– a focus on the meaning and message of the text: What does the text say and how does it say it;
– maintain the written culture – including the extended text idea – by in principle making all forms of expression verbal;
– gestalt of whole and connection. the coherence
– dominance of teacher professionalism

I see the phenomenological position in my own research concerning youth culture and my work with young people in the school in the beginning of the 1990’ies. It holds the young people as voices of authenticity. The scientist and the teacher are observers of another culture. With our pedagogical competence we initiated presentations from the usual non-speaking, non-bookminded, non-school minded pupils – and they become the wise and authentic voices.

The normal procedures are put aside for a while – in favour of the different, the foreign, the extreme – and focuses are on behavior that differs from normal behavior. The teacher and the scientist become the pupils. The other pupils – except the 2-5 hip hoppers – also learn more like the teacher and the scientist.

By extending the youth culture concept to include several trendsetting music cultures (techno, house, grunge) to include role playing culture, electronic playing culture, sports culture (soccer, basketball, hockey), scout culture – more pupils in the class have become active participants. In a project about youth culture the pupils present their different leisure cultures. For one thing that will initiate debates in the classroom which earlier might have led to conflicts when they were not discussed; for another the presentations will be eye openers. 14 year old boy said after a project in his class: ”I did not know that you are so interested in horses and that you learn so much about organizing.” And a girl in the same class evaluated the project like this: ”I think it was really great to hear about the different kind of hiphoppers; hardcore, wanna bee’s, old school and new school, raggamuffin, gangster rap”.

With this view I have looked at:
– the visible resources in the classroom
– an awareness of the individual pupil contributing to the teaching
– what does the text/the culture do
– how does the text/the culture do
– the use of non-verbal (body-language, sense language) as pre-symbolic (inspired by Alfred Lorenzer).
– focus on interaction.
Limitations in such a phenomenological position can be, that the teacher’s professionalism disappears and the common pedagogical can take in the whole room. I think that the pupils should learn more than they already know. They have to be challenged and questioned.

With the youth culture in an educational context the focus is often put on the trend setters. And the teaching materials are often concentrated on the cultures which get the media attention. From the teachers point of view this can be defended if it expresses a meaning, e.g. rap music if it has a verballtext. Rap can be defended in the teaching in the mother tongue because it can be used in prosody, which often builds on the prosody of medieval ballads; because it provides new linguistic expressions. Especially useful are the rap songs, which provide a message, like ”The Message” by Grandmaster Flash & The Furious Five. In this case rap can be defended as being interdisciplinary because the text and the culture can be the occasion of discussions of politics/race and gender politics and ethics.

Then it might happen, that the teachers are back in the critical position, that the local, small story is taken over by the global, media covered culture and the big story, that the diaspora culture (that a youth culture like hip hop is shaped differently in different countries) disappears. Last but not least the sameness come through at the expense of otherness and multivoiced.

Constructivism and poststructuralism

With considerations like this I have moved into theories of constructivism. One of the constructivist oriented didactics of which I am inspired talks of pupil professionalism. If 25 pupils and one teacher work with one text the outcome will be 26 different texts (inspired by Stanley Fish, David Bleich among others). My colleague Vibeke Hetmar has worked with pupil professionalism in literature teaching and showed that pupils read literature as fiction at the age of 10, but they apply different words than the teacher. Instead of talking of third persons narrative the pupil might say that it seems like there is a person in a side car, that tells the story.

Vibeke Hetmar writes in her Ph.D. thesis:

”Behind this position there is no established tradition. To take the position you have to know the pupil's professionalism and we... do not know much about that. The pupil's relation to the theme/the subject has always been seen from the position of the teacher professionalism.” (my translation)
The American anthropologist and professor of pedagogy Jean Lave writes that learning takes place as well in informal togetherness as in formal teaching. In her article "Learning, apprenticeship, social practice" she writes about her research on how tailor apprentices in Liberia become masters. During their apprenticeship they do not only learn to sew but they also learn about men’s pants, about pants for people with no money and for people with a lot of money and how to survive as tailors:

"But gradually I came to see that it was impossible to learn to cut out trousers without learning about other political, economic and cultural practices in which trousers play a part; and in which apprentices participate in the multiple practices of their everyday lives… They were learning to make a life, to make a living, to make clothes, to grow old enough and mature enough to comfortably accept the respect due to a master of their trade… learning as well the sequence and relations of informal and marginal to formal and socially important clothing, social categories and occasions… breaking down distinctions between learning and doing, between social identity and knowledge, between education and occupation, between form and content…” (Lave 1997, 143)
This is what Jean Lave calls "situated learning": a learning process constructed from a context. With this situatedness she breaks down different boundaries:
– between learning and doing
– between social identity and knowledge
– between Bildung and education
– between Bildung, education and leisure time.

In the article I have referred to her elaborates from "situated learning" to "social practice": that you learn in social communities of practice and you are part of different communities of practice. These practices can be in conflict with each other and also have different status for the individual because the practice can be more or less peripheral. She works with the complex idea of "Legitimate peripheral participation in communities of practice (Lave og Wenger, 1991). Legitimate peripheral participation is used to analyze relations between the just arrived and experienced members in a community of practice and the processes which lead to full membership.

Jean Lave does not make the apprentice neither a free flowing individual nor a of the class and gender circumstances determined human being. On the contrary the apprentice goes into connected and non-connected communities of practice and that he/she is doing the social practice through constructions that are about orientation, balancing and negotiation.

The tailor apprentices and the tailors of Liberia are part of another historical, social and cultural context than the young pupils and adult teachers of the Nordic countries. But her awareness of the extended learning/doing process can be an inspiration to show how dequalifying the school still is in the focusing on literary professionalism and teacher professionalism. In connection with Vibeke Hetmar’s model with the view into the classroom I have to add to the position of the pupil professionalism that it concerns a community practice that goes beyond the room of the teaching.

If I take another step and let myself be inspired by poststructuralistic theories in which the normal is broken up and undermined, in which discourses are being destabilized I will introduce the ideas of remnant capital.

Remnant capital is inspired by Bourdieau’s "cultural capital" which I applied to the established or normal school culture. The remnant capital is found in the youth cultures of the 1990’s. Symbolically it can be compared to what we do when we hear a piece of music and exclaim: "I do not know how to explain it". Concerning music and paintings there will be a remnant, which we probably sense but do not understand and cannot put words to. There is a limit for the reading of a painting as there is a limit for the scent of the words in a book.
Exactly in this remnant capital we might find that the resources in the young people when youth culture is being brought into educational contexts are challenged and used.

**Remnant capital** can be:

- **The meaningless**, e.g. techno as music without a lot of words: Should pedagogy find a meaning in the meaningless? Can’t we put up with the meaningless nonsense?
- **The superficial**: e.g. punk and pop with the focus on the acting out the outside: Should pedagogy provide in depth structure analysis and complex connections?
- **The staged**: e.g. football where men are kissing: Should pedagogy provide fixation in the form of analysis models?
- **The fragmented**: e.g. hip hop as diaspora: Should pedagogy come up with analyses that uncovers patterns?
- **The barrier-breaking**: e.g. electronic war playing: Should pedagogy provide the limitations?
- **The pleasure**: e.g. polyaesthetic coherence of words, music, pictures and dance: Should pedagogy provide the serious?

The American professor of pedagogy Patti Lather is my source of inspiration to ask such questions. In her book *Getting Smart. Feminist Research and Pedagogy with/in the Postmodern* she writes about poststructuralisms and feminisms in pluralis. This way she is an inspiration to an understanding of that such -isms are being used several ways and take colour after the different situations and contexts of which they are part of.

According to Patti Lather poststructuralists focus is on ”what is left” after the systematic categorizations. The interest lies in examining discontinuities and otherness.

Theories of emancipation are brought into her book by e.g. pedagogical theories of liberation, which relates to the liberation from the suppression of the ”culture of silence”. By bringing in the pedagogical liberation theories she works against the deconstructivistic positions which she sees as nihilistic breakdowns. At the same time she uses deconstructivistic theories to destabilize discourses by putting discourses into process, disturb them and disorganize categorizations. She mentions three steps which I see as a part of the research process:

1. Identification of binaries, e.g. woman/man, hip hop- culture/soccer culture – youth culture/adult culture or youth culture/child culture.
2. The scientist can turn these binaries upside down by saying them in reverse order so that negatives become positive positions.

3. Making ideas and positions more liquid.

With Patti Lather I ask: How to be aware of behavior that differs from “normal” behavior in a learning situation? With youth culture the question is how to be aware of more than hip hop-culture, techno culture, soccer culture and so on. When something different is put on the agenda, how to be aware of that the different does not become the normal, become an authoritarian position and a positive upgrading – on behalf of academic learning processes. With the last point in mind I ask: How to be aware of normal behavior in a learning situation when focusing on behavior that differs from normal behavior. What I am trying to get to is that we to greater extend have to be aware of paradoxes and ”aporia” (an unsolvable problem): two ideas which are being used in poststructuralism instead of binaries. That inspires us to create awareness of the stuckplaces and twists.

References


Lave, Jean (1997): ”Learning, apprenticeship, social practice” i *Nordisk Pedagogikk* vol. 17, nr. 3.

Values in the ABC-Books of 20TH-Century Estonia

Introduction

During this century, Estonia has gone through radical political and ideological changes. Namely, Estonians gained independence from Tsarist Russia in 1918, underwent Soviet and German occupations 1940-1991, regained independence in 1991, and are now building up a new political and economic order (see, e.g., Høyer et al., 1993, for overview). At the same time, processes of modernisation have taken place, altering people’s lifestyle and value orientations. Gradually, traditional peasant way of life has given way to urban industrial lifestyles. Radical political changes, in turn, have had influence on people’s world views as well as modernisation processes. For instance, secularisation and urbanisation accelerated to a remarkable extent after the Soviet regime was established in 1940.

Values serve among basic cultural indicators to measure societal change. An important distinction has to be kept in mind here: aggregated individual values or “microdata” (for example, averaged data from a questionnaire survey) is not the same thing as societal culture or “macrodata“ (available from an analysis of curricula, textbooks, media content, etc.). It is values held on the macrolevel that are my primary concern in this context. I assume that ABC-books (as well as other school textbooks) manifest socially shared values, attitudes and world views. Values represented in textbooks are considered to be worthy of transmission to the next generation, as a part of “socially approved knowledge“ (Schutz, 1964). These values are taken for granted by textbook authors, officials, educators, parents and, finally, by pupils. ABC-books (and other school textbooks) thus serve as a valuable source of knowledge about societal culture on the macrolevel. It goes without saying that the values selected for a primer’s curriculum also reflect the moral aims of the educators in that period of time. (For an exemplary study based on that assumption, see London, 1984.)
In this paper I will explore what types of values have predominated in Estonian primers throughout this century. I will interpret the results in the context of cultural and political transformations that have occurred in Estonian society. Finally, I will discuss some options in the education of values.

**Theoretical Background**

On the cultural level, values are definable as *the vocabulary of socially approved goals that societal members use to motivate action and to express and justify the solutions* (Smith & Schwartz, 1997, p. 95). Several theoretical value axes have been constructed by social scientists. Roland Inglehart has drawn two dimensions of values: traditional authority vs. rational-legal authority, and scarcity values vs. postmodern values (Inglehart, 1995). These value axes differentiate between three types of societies: traditional, modern and postmodern (Inglehart, 1997). Inglehart has documented that individuals living in more traditional societies can be characterised as emphasising the importance of religion, large families, work and national pride, while individuals of modern societies tend to lay emphasis on politics, responsibility and thrift. The publics of societies most close to the “postmodern pole” tend to lay less emphasis on money and hard work, and more emphasis on ecology, friends and leisure. Postmodernists are also less likely to reject outgroups (for instance, foreigners), they are more tolerant, and they go through a shift of emphasis from family values to self-realisation (Inglehart, 1995).

Another theoretical construct I used in my research is the individualism-collectivism dimension. I do not view individualism and collectivism as two opposite poles of a unidimensional scale. In line with psychologist Harry Triandis, I admit that individualism and collectivism are “two independent factors both at the cultural and personal levels” (quoted from Realo, 1998, p. 27). As formulated by Triandis (1993), “individualism and collectivism can coexist and are simply emphasised more or less in each culture“ (p. 162). In accordance with this, Triandis has suggested that individualism and collectivism should be thought of as cultural syndromes characterised by their “organising themes“. For an individualistic culture, the central theme is an autonomous individual, a concern with “what makes me happy“, “how can I have fun“. For a collectivist culture, the central theme is the collective – family, organisation, state, ethnic group, etc., as well as a concern with what is a good society or what happens to others (ibid., p. 156, 161).
To compare societies in terms of individualism-collectivism, Shalom Schwartz (1990, 1996) has specified the relationship between his system of values (up to 56 indicators clustered around the ten motivational goals they express), and individualism-collectivism as a macrolevel societal dimension. According to Schwartz, two motivational goals, *self-direction* and *stimulation*, and some *universalistic* values (world at peace, social justice, equality) should be more important to the average person in more individualist (contractual) societies. Three other motivational types of values – *hedonism*, *achievement* and *power* – are characterised as “individualist” by Schwartz, but they do not show adequate differentiation between societal types. In more collectivist (communal) societies, *conformity*, *tradition* and *benevolence* should be more important to the average person. One more motivational type of values – *security* – is characterised as “collectivist” by Schwartz. Most of *universal* values like wisdom, broadmindedness, and a world of beauty may serve personal and group interests at the same time.

To sum up, individualist motivational types of values are *self-direction*, *stimulation*, *hedonism*, *achievement* and *power*; collectivist motivational types of values are *conformity*, *tradition*, *benevolence* and *security*.

**Sample**

Among more than 200 editions of Estonian ABC-books published in 1900-1997, I selected 14 primers (11 in Estonian and 3 in Russian) for my study (see Table A1 in the Appendix). I used two main criteria for selection:

- To select a primer per decade of both *widespread* or “*popular*” (according to the number of editions and copies, and to historical sources), and *typical* nature (published primarily or for the first time during the given decade). ABC-books designed for exclusive home use were cast aside.
- To select, where possible, the edition published in *mid-decade* (year ‘‘5 or ‘‘4) to keep the time distance between different primers in the sample more or less equal.

In Tables 1 and 2, the sampled ABC-books are marked through the publishing year. “R” stands for the primers in Russian.
### TABLE 1. RELATIVE FREQUENCIES IN PERCENTAGES FOR TRADITIONAL, MODERN AND “POSTMODERN” VALUES IN ESTONIAN ABC-BOOKS

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<td>MODERN</td>
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<td>14.3</td>
<td>44.0</td>
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<td>“POSTMODERN“</td>
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<td>8.3</td>
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<td>26.7</td>
<td>42.9</td>
<td>37.9</td>
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### TABLE 2. THE DISTRIBUTION OF SCHWARTZ’S MOTIVATIONAL TYPES OF VALUES IN ESTONIAN ABC-BOOKS

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- '++++' - 'VERY FREQUENT' VALUE CLUSTERS
- '++' - 'RELATIVELY FREQUENT' VALUE CLUSTERS
- '+' - 'LESS FREQUENT' VALUE CLUSTERS
- '+' - VALUE CLUSTERS NOT REPRESENTED IN THE PRIMER
Method

I drew on principles of *grounded theory analysis* (Strauss, 1987) as well as *pragmatics* (Blakemore, 1992) to develop a semiquantitative method for the analysis of values in ABC-books. Grounded theory analysis can be characterised as a research technique by which data are analysed systematically, intensively, and in detail (“often sentence by sentence, or phrase by phrase“) to create a theory that is *grounded* in the data (Strauss, 1987, p. 22). The specificity of that method lies in the fact that codes are not strictly preconceived. Concepts, categories and, finally, a theory, emerge during the analysis. Grounded theory analysis is based on a *concept-indicator model* that directs the conceptual coding of a set of empirical indicators. The latter are actual data that indicate a concept or a coded category derived by the analyst. The initial type of coding is termed *open coding*. This type of coding is done by scrutinising the data very closely with the aims of commencing the process of inquiry, and producing concepts that seem to fit the data. Open coding will usually develop into *axial coding*, which consists of intense analysis done around one category at a time. A further phase of analysis is termed *selective coding*, which consists of coding systematically and concertedly for the core categories in the theory (Strauss, 1987).

In this study I did not aim to develop a kind of elaborated grounded theory. Rather, I used some valuable tools provided by that approach (principles of the concept-indicator model, and two types of coding – open coding and axial coding). They were combined with the application of the pre-existent theoretical categories developed by Schwartz (1990, 1996) and Inglehart (1995, 1997). I reached preliminary value categories through *open coding* of the text (and, in some exceptional cases, of illustrations): I gave any of the values conveyed through the text the “most fitting“ code. In this way, I coded all values found in the text, regardless of the number of different values instantiated in one and the same textual unit. In addition, I made use of pragmatic interpretation. That is, I took both *explicatures* and *implicatures* into consideration. It means that explicit value concepts (such as “politeness“ and “loyal“), concepts or images symbolising values (an expensive watch as an index of wealth), as well as values implicated through a narrative or an utterance were given a preliminary code. During the next phase of coding, I compared these codes with value indicators developed by Schwartz (1990, 1996) and Inglehart (1995, 1997). Those preliminary codes that were overlapping with, or substantially similar to, Schwartz’s or Inglehart’s value indicators, were given a corresponding conceptual label (“helpful“, “freedom“, etc.). In the case of other preliminary codes, I retained their original conceptual labels (“masterful“, “orderliness“, “selflessly brave“, etc.). On the principle of semantic proximity, I associated those
codes with theoretical value clusters – the ten motivational goals suggested by Schwartz and the three types of values/societies suggested by Inglehart. For instance, I categorised “masterful” in the cluster of power, “orderliness” fell in the cluster of conformity, and “selflessly brave” went with benevolence. For every primer, I counted the occurrence of values, and calculated the relative frequencies of value clusters.

In addition, I had a more qualitative look at the discourse on home in the ABC-books to reveal the patterns of Familism (a subtype of collectivism focused on relations with family; Realo, Allik & Vadi, 1997) and Masterfulness which is my term to sum up individualistic desire and respect for a household of one’s own, as well as the attitudes and sense of rights and obligations that arise from being a master of private property. The concept is closely related to, and shares elements of, Schwartzian achievement and power.

Results

The findings can be summarised into three theses:
1. Modernisation of values is clearly observable. In the ABC-books of the 1990s, postmodern values gain in the relative importance.
2. Throughout the century, collectivist values dominate in Estonian primers.
3. No significant differences between ABC-books in Estonian and their temporal counterparts in Russian can be found.

The first thesis – modernisation of values

The results are presented in Table 1. In the beginning of the century, in 1907-1922, traditional values dominate in Estonian primers. The relative importance of traditional values exceeds 70% in all ABC-books in that period. Among traditional values, importance of God and religion, importance of work and respect for parents are especially prominent in that period. It is possible to talk about modernisation of values beginning from the second half of the 1920s when the relative frequency of modern values outnumbers the relative importance of traditional values for the first time. It has to be emphasised that secularisation has played an important role in the decrease of the relative frequency of traditional values. Importance of God and religion can be found for the last time in the ABC-book of 1935.

Among modern values, materialist scarcity values such as money, food-
stuff, and new things as well as responsibility are represented to a great extent during the first independence period, that is, until the 1940s. In the primers of the Soviet time, economic growth and technology are added to the repertoire of values while money and wealth are not emphasised any more. The ABC-books of the 1970s-1980s are more “traditional“ due to an emphasis on importance of work and obedience. The heyday of modernisation is expressed in the primer of 1995 – wealth and comfortable life are most valued there while the relative importance of traditional values has decreased to the minimum.

In the ABC-books of the 1990s, a growth in the relative importance of postmodern values can be seen. The primer of 1995 emphasises open world and travelling, the Russian primer of 1996 pays the greatest attention to independence, and the ABC-book of 1997 underlines mental values, importance of friends, and ecology. Traditional values are represented mostly by importance of work, importance of family and obedience in the primers of the 1990s.

It can be said that the process of modernisation has been reflected quite adequately in Estonian primers, (global) postmodernisation has also had its say. However, traditional values have not disappeared. Importance of work is most permanent among traditional values; obviously, this is the function of the cultural dominance of work in Estonia. It is to be noted that political-ideological changes have also had an impact on modernisation of values: “as a matter of course“, values related to religion cannot be found in the Soviet primers, while wealth and comfortable life deserve attention in the ABC-book of 1995, a child of early capitalism.

**The second thesis – collectivist culture of ABC-books**

The results are presented in Table 2. To make the findings more lucid, I developed an easily comprehensible system of plusses and minuses:

“++” refers to “very frequent“ value clusters, with a relative frequency of at least 10% (before rounding), and an absolute frequency of at least 3.

“+” refers to “relatively frequent“ value clusters, with a relative frequency of 5–9% (before rounding), and an absolute frequency of at least 2.

“–“ refers to value clusters not represented in the primer.
The very first glance at Table 2 bears witness to the fact that value clusters associated with individualism (the upper half of the table) are represented less frequently than value clusters associated with collectivism (the lower half of the table, except universalism). Moreover, there are no easily perceptible changes in this pattern. Thus, in the most general terms it can be said that no drastic transformation of values along the axis of individualism-collectivism has occurred in this century. In particular, values best characterising the individualistic type of society (those centred around motivational goals of self-direction and stimulation) can be seen remaining less important than motivational goals more prevalent in the collectivist type of society (conformity, tradition and benevolence). Yet, there are some non-extensive changes and important details to which one should pay attention.

In the ABC-books of the 1990s, slightly greater emphasis is laid on individualist motivational goals. In 1997, self-direction (values such as independent, freedom and creativity) is represented relatively frequently. In the Russian primer of 1996, self-direction (independent, in particular) and achievement are emphasised to a remarkable extent. In the 1995 Estonian ABC-book, power (wealth) deserves much attention (wealth is implicated, for instance, through a picture of a living-room with many expensive electronic devices).

We can see that hedonism is the most frequently represented individualist motivational goal in ABC-books. Perhaps this is due to the specificity of these teaching media. Values like pleasure, cheerfulness and happiness are accepted to be suitable for the readers of primers. However, the oldest (and the most traditional) ABC-books in the sample are, en bloc, somewhat less “jolly“. The relative importance of hedonism is far less than 10% in 1907-1922.

I find it remarkable that conformity is the one and only motivational goal to be represented very frequently in all ABC-books. This, again, has probably something to do with the specificity of the medium. In other words, children of that age must be socialised into some behavioural patterns of the society regardless of any simultaneous larger-scale societal transformations. The most recurrent and stable value categories for conformity are diligence, obedient and politeness.

Signs of modernisation can definitely be inferred through the decline of tradition (values like being humble, respect for tradition, etc., are very frequent only in the oldest ABC-books).

It is worth mentioning that values related to benevolence (helpful, kind, friendship, etc.) are completely absent in only one primer, the 1995 Estonian primer. That ABC-book can be regarded as a “lawful child and true re-
flection of young and immature Estonian capitalism. It is the most individualistic and least collectivist primer. It appraises wealth and hedonism, while tending to ignore benevolence and traditions.

*Universal* values are represented very frequently in almost all ABC-books.

In most of the ABC-books in the sample, the construction of home-related identity comprises identification with one’s family, consisting of mother and father, sister(s) and brother(s). I would interpret this as a persistent indication of Familism – collectivism focused on relations with family. This pattern, however, is juxtaposed with a *continuous* individualistic feature of the discourse on home – Masterfulness – most of the primers (except the 1955 Estonian ABC-book and the 1996 Russian ABC-book) present a farm or a private house as the typical home, that with which the reader is to identify.

I would interpret these findings as follows. It is probable that the dominance of collectivist values in Estonian ABC-books is mostly due to a long-preserved cultural syndrome on the macrolevel – these are collectivist values Estonians assume to be *socially approved*. In other words, Estonian people believe they are supposed to hold these values. To take one step further, they also presume that they are expected to socialise the young generation into collectivist values. As a result, collectivist rather than individualist values prevail in Estonian ABC-books. (To be sure, the very specificity of the medium also plays a role here. Primers as pupils’ first textbooks serve a pedagogic objective to socialise children into a collective in its broadest meaning.) I would say that the dominance of collectivist values in Estonian ABC-books can be seen as a function of the “cultural Super-Ego“. Educators take it for granted that collectivist values are socially ordained in the given culture.

Logically, then, I would interpret weak but persistent individualistic features in the primers’ discourse as a function of the “cultural Ego”. Masterfulness – respect for private property and desire for a household of one’s own – has long been honoured among Estonians, at least on the individual level. I would say that individualist values often serve as the true guiding principles in individual Estonians’ lives, influencing the “selection or evaluation of behaviour, people, and events“ (Smith & Schwartz, 1997, p. 80). The primers of the 1990s reveal that certain individually held individualist motivational goals (such as *self-direction*, *stimulation* and *power*) begin to obtain some overt recognition and manifestation on the macrolevel. In other words, some individualist values are assumed to be socially approved to the extent that they have been included in the “hidden curriculum“ of ABC-books – parts of the hitherto “cultural Ego“ become sanctioned by the “cul-
tural Super-Ego” as well. Obviously, this process can be linked with societal transformations of the 1990s – the transition to a free-market economy, the withering away of the Soviet collectivist mentality and the cooling down of strong national feelings among Estonians.

My conclusion is that the individualism-collectivism construct can be used in textbook studies with the understanding that individualism and collectivism are thought of as two relatively independent factors both at the cultural and personal levels. Still, circumspection is to be retained in drawing conclusions inasmuch as the institutional character of teaching media most probably induces textbooks toward “excessive” collectivism rather than individualism. To be sure, the utility of the individualism-collectivism dimension for textbook analysis ought to be re-assessed through comparative studies of primers and other textbooks from different countries, especially from cultures usually characterised as most individualistic (British, German, North American, etc.).

The third thesis – similarity between Estonian and Russian ABC-books

Without paying attention to any details, I would like to emphasise that this finding – the similarity between the primers in Russian and their temporal counterparts in Estonian – does not coincide with a common notion, or cultural stereotype, about Russians being more collectivist than Estonians. This paradox may be due to shared cultural notions among Estonian and Russian-Estonian educators, and/or a mutual (?) example-setting agency of Estonian and Russian teaching media.

Discussion

This study has documented what values are represented in a specific sample of textbooks. Now, one may wonder what types of values are most desirable in moral education. Modernisation of values is, without doubt, a natural cultural process, and timeliness of educational media is definitely positive. The growth in the relative importance of postmodern values (such as mental values, friends, independence, ecology, etc.) in the ABC-books of the 1990s can certainly be regarded as positive. The similarity between Estonian and Russian primers is also an advantage since values shared with Estonians are among necessary preconditions for successful political and cultural integration of local Slavs with Estonians (see Vihalemm & Lauristin, 1997: 296).
It is much more difficult to evaluate the proportion of individualist and collectivist values and the current developments there. Triandis (1993) argues very clearly that extremes of either collectivism or individualism are undesirable. He is convinced that severe conflicts between in-groups (such as ethnic cleansing, wars, etc.) result from extreme collectivism. On the other hand, Triandis argues, high rates of delinquency, crime, homelessness, and heart attacks, as well as the weakening of the family (with increasingly many examples of selfish child neglect or abuse), must have some relationship to the extreme, narcissistic forms of individualism that have emerged in welfare states such as Britain and the United States (ibid.). To portray the situation, Triandis uses a nice metaphor. He suggests thinking of collectivism as water and individualism as molecules of ice. As the temperature changes, the ice crystals either form or crack. At all times we have some water and some ice, that is, both collectivist and individualist elements. The subtext of this metaphor is frightening: as a shift from collectivism toward individualism accelerates in many countries, the earth is entering a new ice age!

For small nation states like Estonia, the individualism-collectivism issue is a double-edged sword. On the one hand, certain elements of collectivism (values like a sense of belonging, respect for tradition, etc.) are essential for a small nation to survive (currently, just about one million ethnic Estonians live in Estonia). On the other hand, in the globalising world, often also as a heritage of the colonial past, many nation states, including Estonia, face the task of political and cultural integration of ethnic minorities. Some psychological experiments (for example, Earley, 1989) have shown that the distinction between in-groups and out-groups is much less important for individualists than it is for collectivists. It follows that the integration process in a multicultural society will probably be more successful if individualist values are socially approved in the society as a whole.

These two arguments taken together, the general conclusion can be just one: the overall outcome will probably be best, if such cultural forms are promoted that select the finest elements of both individualism and collectivism. To my understanding, self-direction and stimulation for individualism, and benevolence for collectivism are good examples of desirable motivational goals. Most of the values in those clusters are fairly remote from potentially harmful extremes. Still, promotion of universal values is probably most important in this respect. Values like wisdom, broadmindedness, inner harmony, and a world of beauty may serve personal and group (both in-group and out-group) interests at the same time, whereas values such as equality for all, social justice, protecting the environment, and a world at peace serve primarily the interests of a larger collectivity beyond the in-
group (cf. Schwartz, 1990). I may note approvingly that universalism, at least, is represented very frequently in all except one of the Estonian ABC-books in the sample.

References


**Notes**

1 In fact, Schwartz has specified two sets of value clusters – one for the individual level and the other for the culture level of analysis (see Schwartz, 1994). Since ABC-books are macro-level phenomena, the use of culture level value clusters seems more appropriate and logical. However, Schwartz’s culture level constructs (*Mastery, Hierarchy, Conservatism, Affective and Intellectual Autonomy, Egalitarian Commitment, and Harmony*) have been criticised for being confusing and for making no immediate psychological sense (Kagitçibasi, 1997). I would add that Schwartz’s culture level value clusters are actually less appropriate for a study of textbooks (or for any other textual analysis) since they are more coarse (there are only seven culture level clusters compared to ten motivational goals on the individual level) and semantically indistinct and incoherent (for instance, the value “humble” falls in the cluster of *Hierarchy*, and “freedom” is located in the cluster of *Egalitarian Commitment*).

2 Since values characteristic of rational-legal authority were very infrequently represented in all primers (values like state responsibility, importance of politics, etc., are generally considered irrelevant for children of that age), I combined the few values pertaining to rational-legal authority with scarcity (materialist) values, and gave them a common label – “modern values“. In this way, the two value axes suggested by Inglehart (1995) were reduced onto one with three clusters of values – traditional, modern and “postmodern” (the labels coincide with Inglehart’s societal types). I use quotation marks in talking about “postmodern values” since the analysis involves primers also from the beginning of the century. Values we now call “postmodern” are, however, present already in those ABC-books.
What is in a word? The many discursive levels of value

What method of analysis did you choose? How exactly did you approach your study? Each time I introduce myself as someone who is engaged in the study of conceptualisation and educational tools I am almost always immediately asked these questions, and rightly so.

I have carried out two large study projects, encompassing a large amount of study material. In 1990 I studied the intercultural content of geography and history textbooks used in the eighties. At that time, I was particularly interested in the chapters about migration and about the Netherlands as a multicultural society. Amongst other things I examined what was being said about each particular population group, working very systematically and analysing passages quantitatively as well as qualitatively.

Recently I finished my doctoral thesis, a cultural historical study into the meaning of race in geography textbooks used in Dutch schools between 1876 and 1992. Both studies focussed on the discursive processing or construction of social relationships, eurocentric opinions and other notions of superiority, including “white” superiority.

Despite these similarities, I employed a totally different methodological approach in each study. In fact, my last study was a search for a more satisfying method, resulting from my uneasiness with the previous study. I opted for a rhetorical analysis.

In this paper, I will give you a modest impression of the methodology I have used in my thesis and the considerations on which my approach was based.

I carried out historical research. On the basis of geography textbooks my intention was to form an impression of natural, normal variations of racism in the Netherlands. Textbooks constituted the appropriate study material, as their content must have been socially based. The immediate reason for my study was the discovery that the term Arace® was included in educational material up to 1992, while many scientists had already rejected this term right after the Second World War. Since that time Arace® has been
considered a social political construction. I payed particular attention to the period from 1930 up to 1950. I also consulted scientific material for this period, amongst other things in order to be able to explain the growing attention given to races in school textbooks after 1950, meaning after World War II.

Yet, my study ultimately does not offer a precise historical account of the use and the meaning of the term race over more than a 100 years of geography teaching. I went for a different approach. I wanted to use the opportunity to analyse the texts in detail and from various points of view. In any case I wanted to liberate myself from the yoke of quantitative analysis and did not want to set up a database and perform statistical calculations. I wanted to be able to immerse myself in the texts and pay attention to the apparently most insignificant elements in the text, including punctuation and accents.

That is why I opted for case studies. They target the various periods and focus on a specific discursive aspect. On the one hand, the analyses lead to an intensified development of theories on racial discourses in the Netherlands. On the other hand, and this is what concerns this paper, they also show the scope of the field of critical discourse analysis. This extends beyond an analysis of social representations or of stereotypes. Such analysis usually concentrates on the predicates: what exactly is being said and about whom? My study shows how at other levels in a text social balances of power can be expressed and find (new) form. The actual descriptions of races are part of this. Apart from this I examined the physical geographical descriptions of continents, the role travel has played and the photographs of races.

In fact, racial characteristics are set out in only a few pages, and yet the rhetorical meaning of them is of crucial importance. Why did I opt for a rhetorical approach and why did I not want to quantify, as is a tradition in content analysis? I will briefly draw attention to some of the problems.

In content analysis the quality standard is calculated in measurable, quantifiable units. The researcher is able to make systematic analyses through these established indicators. For each unit a score is determined. It is also possible to quantify in order to get an overview of the subjects on offer. Sometimes a strict distinction is claimed between the quantitative and qualitative phase. I also did that in my previous study. I counted the various topics, I decided on the size of the texts about the various population groups and the relationship with the subject matter. However, it turned out that not in every case could topics and groups be unequivocally established. I was able to give a rough indication of the total text on multicultural society, but any further refinement raised new difficulties. Moreover, one thing is un-
doubtlessly clear: it is always a matter of interpretation, even at the quantita-
tive stage. As a matter of fact in the categories the factor of quality is al-
ready implicit.

However, when quantifying population groups and topics, as I did in my
earlier study, unsuspected dilemmas turn up without a solution. Sometimes
it is better to stop the counting. I will illustrate this.

If you want to measure you have to set a unit of measure. In most of the
cases this will be a passage or an episode of a certain length. This means
you have to rely on the authors. They will have to have written a transpa-
rent, clearly structured account. However, especially in text on the multi-
cultural society this was often not the case. It happened, for example, that I
was examining a passage on guest workers, which, after a few sentences,
moved across to Muslims, then to foreigners, then to minorities in general
and then to “them” and “the other“.

Such passages do not require measuring but require detailed examina-
tion. The above furthermore illustrates that the multicultural content of a
school textbook can not be measured. The first question is not what is said
about “they“ or about “us“, but who is “we“, who is included, who is exclu-
ded. From an intercultural perspective, it is first and for all important that
all pupils are addressed, that etnocentric viewpoints are avoided and multi-
cultural perspectives are included. These criteria hold for all educational
media. They cannot be made effective via measurable categories. You need
a rhetorical approach.

At this point I would like to link in with my historical study, in which I
performed particularly rhetorical analysis and concentrated myself on the
question of who is being addressed, or: how does subjectivity come into
existence? Social differentiation becomes the keyword.

When analysing racial discourses and determining to what extent these
favour a white person one has to examine how differentiation based on race
comes into existence. My research became a systematic study of subjectivi-
ty as an organising principle. Coherence became the point of attention. This
coherence falls by the wayside when you divide the text into independent
topics. I wanted to focus on the structure, the grammar or building blocks of
these texts, the implications and hidden premises and therefore not too much
on topics.

How are values, opinions transferred to the reader, who are they suppo-
sed to identify with or, who is the speaking subject and who is spoken to?

My attention to coherence entails the disadvantage that it is very diffi-
cult for me to give you a good example within the framework of this papers.
Nevertheless, I will try to describe what I did and will take an enormous
leap into the past, to textbooks from the period around 1900.
As I said before, actual information about the different races is minimal. And despite the opinion that in the past racism was very unambiguous and explicit, one cannot say that the authors in the past bent over backwards to express the inferiority of the so called non-white races in denigrating terms. The racist component of Arace@ emerges earlier, in the course of the whole account, for example in the account which is given within the context of the complete physical, geographical and natural history subjects. Let us start with the latter. Around 1900 the school textbooks still maintain the tradition of natural history, in which different plants, animals and humans are systematically described. The description of humans, i.e. races, follows after the description of the plant and animal kingdom. This also occurs in the geography textbooks. The motivations which determine a hierarchical ordering of plants and animals, play a role in the text about races. Evolutionary thinking and geographical determinism make their influence felt. The discursive coherence between plants, animals and people is unmistakably close. People are described as part of nature, meaning an ordered nature. The reader is seduced to connect these paragraphs, by the metaphors, the idiom and the argumentation. They emphasize the interrelationship. Survival, territory, evolutionary stages, propagation and extinction are terms which are used in the description of the plant and animal world, both in their mutual relationship and in relation to the physical geographical environment. They also fit in with the description of the relationship people have with their environment and other organisms. The correlation imposed by the texts has a rhetorical effect: humans (races) do not differ in their behaviour from the species of plants and animals. Their behaviour is innate and natural. When we, in the short description of the races, – and you get the feeling that some information and argumentation is left out – come across an indication of their ability to spread themselves over a larger area, this motif gathers extra significance when we place it within the context of the previous paragraphs on plants and animals. There the capability to spread is a sign of strength and power to dominate. Of some races it is said that: They are heading for extinction@, or: “where whites make their entrance, they will decline“. This indicates their weakness. Such argumentations, or rather spurious argumentations, result in the reader regarding types of repression based on race or colonial processes as natural processes, as an inevitable result of the struggle between the races. Of course the readers like to identify with the white race. At an earlier stage they are encouraged to except or embrace this identity, although subjectivity is almost absent. Usually the textbooks contain a chapter on The Netherlands and a paragraph of the Dutch, a chapter on Europa and a paragraph on its inhabitants, and they speak about mankind and its successes. But the first thing you read about
the Dutch is that they belong to the white race. And the same holds for the Europeans. And once in a while the readers are addressed as Dutch and white, as European and white, as civilized, as “we“, the true representatives of mankind. A positive picture is painted of their future, which can be traced back even to sentence structure. The syntax (in the form of X leads to Y) and the choice of words support this optimism. Their identity is first and for all predicated by their race.

Not only in natural history accounts does race play a role, also in physical geography. In many books an identical thematic ordering can be found. And although it can be said that subjectivity is greatly repressed in older books – historical accounts are not allowed – sometimes this subjectivity comes to the surface, for example when you leave the topics in their original order. Then it appears necessary to include views from the narrative in the analysis of the discourse. The story behind it is frequently the story of Europe in the making. I am using the word story as we can clearly trace a time line, a chronology as an underlying structure. Time and movement start in Europe. I describe that process in my chapter on travel, the colonial or imperial explorations which frequently form the background to the topics in the physical geographic structure.

The role of the account of this exploration manifests itself particularly clearly in the thematic ordering in the accounts on Africa. In general, this description is built up around the following subjects: in the old school textbooks Africa is called the continent of plateaus, then it becomes the massive continent, where the sea does not enter far. Next it is described as the continent which is hard to access: the rivers and the plants form an obstruction. Then briefly the meeting of Europeans with the inhabitants is, amongst other things, described as when penetrating, the Europeans come across a strong race: the negro race. And finally, I quote: In the tropical colonies the development of plantations is made very difficult by the lack of a suitable workforce. End of quote.

Here, we are facing the rhetorical effect of perspective, of the subject of looking, of watching. That subject determines what we see and when. We only understand the quotations properly when we put ourselves in the place of the European discoverer who approaches Africa from the sea and tries to penetrate the country in order to form an opinion of the opportunities for development. In fact we are reading fragments of the history of European colonialism. They are projected on to the geographical description of Africa. The discursive relationship with travel stories of, for example, Livingstone or of the leading character in Conrads At Heart of Darkness, are unmistakably present and make the subjectivity explicit. When later, around the thirties and forties it is permissible to include historical
facts, journeys of discovery become the property of the white race and the perspective of the description of the continents becomes explicit. They start with the voyages of discovery.

Again the effect is naturalizing. The African subject was part of nature. The perspective was implicit, but clear. Time and movement become the property of Europeans and white people. Their entrance was allowed. They only had to overcome the difficulties caused by nature.

Up to now I have given you a very brief impression of my method of analysis in the first chapters of my dissertation. The first example shows the rhetorical effect of lexical and argumentative coherence. The second example shows the effect of perspective, of time and movement. The old texts, which I include in my dissertation, are still fairly straightforward. For me this had the advantage that I could obtain a fairly clear idea of the way in which superiority in general and especially a white subject, was created. From there I could draw a connection to the present time, to present educational discourses and to the intercultural debate. Is my method of research correct? I have chosen for each period a representative corpus. I have traced interdiscursive correlations with scientific thesis and literature. I have been able to work systematically, but I was not able to process my conclusions in a schedule. The reader is faced with my interpretation and is given ample opportunity to think along with me with the help of many quotations. In this way, I hope to convince him or her that not only a single word, but also the thematic ordering, give meaning, and are able to alter the meaning of the text completely. Apart from the topics, they too are able to transmit social and political values.
Part 3

Evaluations of Textbooks
Experimental evaluation of textbooks and multimedia

According to the bylaws of IARTEM the main purpose of our association is “to promote research on and understanding of textbooks and educational media.” The research has been promoted at our conferences by representing the results of different interesting investigations. The results have deserved keen attention but usually there was little time to analyse the methods on which the results were based. I think that textbook research methods need special consideration by our association. The history of science gives many examples of the importance of developing research methods. If there is no new research method, the branch of science is in the danger of decay. New research methods usually lead to new discoveries and flourishing of the field of science.

Textbook research methods can be divided into three groups. Let us look at them very briefly.

Nowadays the most common method is to ask teachers, parents, or students about the different aspects of textbook quality. Very many questionnaires have been composed to obtain the assessments (Die Schulbuchbegutachtung … 1991; Tyson-Bernstein 1989; Tholey 1996; Rauch & Tomaschewsky 1986; Vassilchenko 1995). The theoretical aspects of the expertise have been studied by V. S. Cherepanov (1991). The method is easy to implement and questions can be put to all the aspects of textbook quality. On the other hand, different experts may differently evaluate one textbook and therefore the evaluations are sometimes of questionable value.

The second group of methods is textbook analysis. The analysis consists in counting some characteristics of a textbook using strictly fixed rules. For example, counting the word length and the sentence length enables the researcher to calculate the readability index of a textbook. The analysis can be often computerised and carried out before using the textbook in school or even before printing. In the latter case, the unsatisfying text can be rewritten before printing the textbook. On the other hand, it is difficult to define the exact rules for counting all the important characteristics of textbooks and sometimes it is not clear if the data collected are really implementable in textbook evaluation.
The experimental evaluation of textbooks is usually carried out in schools. The results of an experiment are the most reliable indicator of textbook efficiency and the results serve as basis for validating other methods of textbook evaluation. Therefore, the experimental evaluation is crucial in textbook research. On the other hand, experimental investigations take much time and need considerable funding. Experiments should not be carried out before the textbook analysis has revealed that there are no serious shortcomings in the textbook. Otherwise the development of the participants in experiment can be hindered.

The experimental investigation of a textbook can have two aims: we may want

1) to ascertain if the textbook under study could be used in school,

2) to ascertain which of the two or more textbooks is better.

We will discuss the two types of an experiment separately.

**Determining the appropriateness of a textbook**

One of the biggest problems in Estonian schools is the difficulty of the textbooks for children. The textbooks overload pupils, hinder the development of thinking and self confidence, demotivate them to read all the life. On the other hand, textbooks should not be too easy for pupils. How to find out which textbook is appropriate for pupils?

To solve the problem three issues should be considered:

1. which students should take part in the experiment,

2. which tasks should be composed to the content of the textbook,

3. which level of correct answers is the optimal one.

The first issue is simple to handle if the number of students in our interest group is small. In this case, all the students can take part in the experiment. However, in most cases the researcher is interested in the appropriateness of a textbook for a large number of students. *The students participating in the experiment should be representative to all the students in this case.* A representative sample can be formed by random sampling of students from the whole sample of potential users of the textbook. In practice, random sampling is seldom used as it is difficult to organise an experiment when there are only one or two students participating from a school. Therefore the whole sample is divided into subgroups and from each subgroup a specified percentage of students is invited to participate in the experiment. For example, if the whole sample has 40 percent of students studying in countryside schools, then the representative sample must also have 40 percent of
participants from countryside schools. We see that the representativity of students in educational experiments is analogous to the representativeness of respondents in sociological investigations.

Which is the optimal size of a representative sample of students for the experiment to evaluate a textbook? The size of the sample depends on the desired exactness of results. The more students are involved in the study, the more precise the results will be. The number of students participating in an experiment does not depend on the size of the total student population, it depends on the diversity of the population and the allowed error of measurement as can be seen in the Formula (1).

\[
n = \frac{t^2 \delta^2}{(\Delta x)^2}
\]

(1)

where

\( n \) - number of students in experiment,
\( t \) - Student's coefficient,
\( \sigma \) - standard deviation of results,
\( \delta x \) - allowed error of measurement.

To use the formula, we have to know the approximate value of the standard deviation of the results and we have to fix the allowed error of measurement. The approximate value of standard deviation can be estimated in preliminary experiments and the Student’s coefficient can be found in statistical tables. Then the number of participants in the experiment can be calculated.

The second issue deserves more thorough analysis. The starting point of the analysis is the idea of representativeness of the test that can be composed considering the content of the textbook. The methods for composing the representative set of test items are the same as in composing a representative sample of students. In principle, the test items can be randomly selected from all the possible items in the textbook but the method is not used because an all-covering set of items is usually not available. Therefore it is important to classify all the elements of the textbook content and to compose test items so that the numbers of the items in all the classes are proportional to the element numbers of these classes of the textbook.

There are many possibilities to classify the elements of the textbook content. For example, if 30 percent of information is given on illustrations in the textbook then there should be composed 30 percent of test items on the content of the illustrations. The other basis for the classification of textbook
elements might be the level of acquisition according to Bloom, the grouping of the content items and others.

The number of items in a textbook referenced test is a problematic issue. In principle, the number of items should be determined as the representative sample of students was suggested to be obtained, i.e. according to Formula (1). It means that several hundred items are needed to evaluate a textbook. Experimental investigations have proved that about 400 items are needed to obtain the results with an error of measurement lower than 5 percent of their extent in 95 percent of cases (Mikk 1981, 93).

Let us consider another aspect of composing questions to a textbook. It is well known that some questions for a text may be difficult and the other questions for the same text may be easy. How can we assess textual difficulty if the answers to the questions depend heavily on the characteristics of the question? To assess the text, the questions should have the same level of difficulty as the text.

J. S. Chall (1958, 40) writes about an investigation in which a correlation 0.62 was found between the complicacy of texts and the complicacy of questions formulated for the texts. It seems to be a relatively high correlation but nevertheless the a correlation is 0.78. Consequently about 60 percent of the variation in the complexity of questions did not correlate with the complexity of texts. These questions do not enable the researcher to assess the difficulty of texts.

Analogous results were later achieved by E. B. Entin and G. R. Klare (1980). They found that some multiple-choice questions were answered correctly by 80 percent of testees without reading the corresponding text. It distorts the difficulty indices developed on answers to multiple-choice questions.

We carried out an experiment to establish which characteristics of questions are correlated with their difficulty. We took 4 sections (about 500 words each) from a physics textbook, constructed 8 versions of questions for every text and 304 tenth grade students answered the questions after reading the passages. Every student answered only one version of questions on a text. There were altogether 320 questions under study.

We tried to compose equal test versions for a text. Nevertheless, the results of the experiment indicate that the versions from 10 questions were different. For example, the testees answered correctly 48 percent of questions in one version and 67 percent of questions of another test version on the same text. Of course, a part of the difference in these figures may be explained by the differences in students' abilities, who answered the versions but the influence of the difficulty of questions must be considered as well. To specify this influence, we calculated the correlation coefficients
between the characteristics of questions and the percentage of correct answers to the questions. The correlations elicited the following factors of the difficulty of questions.

1. The questions on terms were answered better than the questions on facts or notions.
2. Fewer correct answers were given to the questions which had longer answers in the text.
3. It is more difficult to produce the correct answer when the number of concepts associated with the answer is larger.
4. The longer the words of the question, the fewer correct answers were given.
5. The percentage of correct answers was 71 for the questions based on the recognition of the material and 56 for the questions aimed at the reproduction of the material.

Analogous results were obtained by K. Green (1984). She varied multiple-choice answers to a test item and, as a consequence, the percentage of correct answers changed from 22 percent to 70 percent. Careful compilation of questions on a text is crucial in obtaining valid indices of its difficulty.

Multiple-choice questions are frequently used in tests. One of the choices is correct and the others are not. Sometimes the testees do not know the correct answer but, nevertheless, they mark one of the choices as correct. *Guessing of answers* is sometimes successful and so the testees get a somewhat higher result than their actual level of knowledge allows. This distorts the results. To calculate the actual level of knowledge, Formula (2.4) can be used.

\[ A = \frac{R - W}{k-1} \times \frac{n}{100} \]

(2)

where:
A - achievement level of the testee in percentage,
R - number of correct answers,
W - number of incorrect answers,
k - number of multiple-choice answers to a question,
n - number of questions.

The formula is often used in scoring standardised tests. It is expressed in the rules such as subtract 0.25 points from the number of correct answers.
for every incorrect answer (Taking the SAT I... 1994, 76). The correction from the Formula (2) will be greater when the number of multiple-choice answers to a question is small. In the case of two alternatives the number of incorrect answers should be subtracted from the number of correct answers. Without using the Formula (2) we cannot figure out the actual results of textbook referenced tests.

There are also other methods for the assessment of the difficulty level of textbooks besides the answering of questions. The cloze procedure is the most promising. The method lies in deleting every n-th word in a text under study and in filling in the blanks by students. The higher the percentage of correct fulfilment, the easier is the text to be understood.

The cloze procedure seems to be very different from answering questions but actually the methods are similar. To produce a question, the investigator often deletes a word or a phrase in a sentence, substitutes the deleted word or words by a question word and rearranges the words according to the rules of interrogative sentences.

In some aspects the cloze procedure is a better method for measuring text difficulty than questions are. To produce questions, the investigator can substitute no matter which word with a question word and, therefore, the difficulty of questions depends on the investigator's choice. Contrary to this discretion of an investigator, in cloze procedure the word is deleted only by strict rules. Therefore the results of a cloze test should give exact indices for the comparison of difficulty of texts.

The comparison of questions and the cloze procedure also indicates some of the shortcomings of the cloze procedure. Always only one word is deleted to produce a blank in a cloze test but to produce questions sometimes a phrase is substituted by a question word. Questions on a text may be composed relying on two or more sentences but this possibility cannot be used in cloze procedures. Due to these shortcomings in the cloze procedure, its validity may be lower than the validity of questions especially in measuring comprehension on the inter-sentence level.

Nevertheless, the cloze procedure is an appealing method for measuring text comprehensibility. Many researchers have concluded that the cloze procedure gives better results than readability formulae (Hater & Kane 1970; Potter 1968; Weintraub 1968). J. R. Bormuth has written a survey about cloze procedure and found correlations 0.73 - 0.95 between cloze tests and answering questions (Bormuth 1968). I. A. Rapoport and his co-workers (1976) have received a correlation 0.96 between the integral indices of foreign language knowledge and the results of a cloze test. The indices of cloze test validity are relatively high to approve the use of the method for the measurement of text difficulty.
Let us proceed to the third issue of determining the appropriateness of a textbook for students: which difficulty level is the optimal one. It is obvious that too difficult or too easy a textbook is not the best. There is some optimal level of correct answers to the questions or correct fillings in the blanks of cloze procedure. The following overview will consist of three parts: the optimal level of text comprehension, text acquisition and cloze tests.

Text comprehension and text acquisition are measured by giving testees questions to answer. In both cases, testees should have enough time to answer all questions. The difference between the measurement procedures is the following. In measuring text comprehension, testees can use texts all the time for the formulation of their answers. In measuring text acquisition, testees study the text independently, then put the text away and answer the questions.

There is a standard for comprehension tests widely used in the USA. According to the standard, a text is suitable for independent study when the student can comprehend 90 percent of its content. A text can be studied with teachers' help when the student can independently answer correctly 75 percent of the questions set on the content of the text (Bormuth 1968).

The criteria are supported by the tradition of programmed learning. Many authors (Agur, Toim & Unt 1967, 95; Nikandrov 1970, 39) write that linear programs are suitable for students if they give 90-95 percent correct answers. Questions in linear programs are answered by using texts, therefore the criteria can be seen as criteria for text comprehension.

The specialists on reading H. P. Smith and E. V. Dechant (1961, 243-248) are convinced that a book is too difficult for children when they can understand less than 85 percent of its content. Obviously, it is the lowest comprehension level where the text can be used for independent study. When the comprehension of the text is 75-90 percent, it can be studied during supervised instruction.

The acquisition of study material is the most frequently used aim of education, therefore many specialists have written about its required level.

J. K. Babanskii (1977, 59) has claimed that the study material is reasonably well acquired when students can answer correctly at least 70 percent of questions. At the lower level of comprehension, the acquisition is not stable and students waste their time.

Specialists on programmed learning have given their students tests after learning a chapter. They allowed their students to go to next chapter when students answered 70 percent of test items correctly (Talyzina 1975, 306; Taranov 1976, 94-95).

Reading specialists also agree with the criteria. They write that acquiring 70 percent of text content is satisfactory (Kuznetsov & Khromov 1977, 30; Maanso 1969).
Theorists on mastery learning have studied the optimal level of acquisition. They are convinced that acquisition at the level of 80-90 percent is the most appropriate (Anderson & Block 1985). N. O. Cristoffersson (1971, 130-131) has studied the time needed for learning. He concludes that learning is most economical when the average level of acquisition is 80 percent. Then the able pupils acquire 100 percent and less able 60 percent of the study material. In our experiments with seventh grade students we have found that the average optimal level of acquisition should be 70 percent of study material in mathematics and history (Mikk 1981, 312).

The criteria of optimal values for cloze tests were studied by J. R. Bormuth. He found in a study that comprehension at a 75 percent level is comparable to 44 percent on a cloze test and 90 percent comprehension level is comparable to 57 percent in a cloze test drawn from the same passage (Bormuth 1968). In another detailed experimental study he found the following criteria of optimality: willingness to study was the highest with 50 percent correct answers on cloze test, difficulty preference ratings were the highest with 55 percent of cloze score, style preference ratings and subject matter preference ratings were the best with 70 percent of cloze score, the rate of reading was the highest with 72 percent of cloze score, and information gain was the largest by 80 percent of correct answers to cloze test (Bormuth 1971, 113). J. R. Bormuth has also elaborated summative optimal values of cloze test for grades 3 to 12. He has found, for example, that the optimal cloze score is 54 percent for the textbook and for voluntary reading 62 percent in grade 3. In grade 12 the optimal cloze scores were found to be 48 percent for textbooks and 36 percent for voluntary reading (Bormuth 1971, 138-139).

What to do if a textbook has been found to be too difficult for students? There are two possibilities: to rewrite the text in a more readable manner and/or reduce the amount of study material. The rules for readable writing have been presented by many authors (Baumann, Geiling, Nestler 1987; Flesch 1960; Klare 1985; Mikk 1984) and we will not refer to the rules here. We will illustrate the calculations of the optimal amount of study material using two examples. The idea laid down as the foundation for the calculations is that the amount of compulsory study material should be reduced to the extent that enables to achieve a positive mark by almost all the students.

In the first example the results of a test in geography are used as the indicator of textbook difficulty. The test was written by 854 ninth grade pupils who used the textbook (V ja IX... 1974)*. The test results were assessed on a 20-point scale (Table 1)
Table 1

The results of the test in geography

<table>
<thead>
<tr>
<th>Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of testes</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>22</td>
<td>24</td>
<td>31</td>
<td>44</td>
<td>59</td>
<td>73</td>
</tr>
<tr>
<td>Percentage of testes</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>100</td>
<td>99</td>
</tr>
<tr>
<td>Cumulative percentage</td>
<td>100</td>
<td>99</td>
<td>98</td>
<td>95</td>
<td>92</td>
<td>88</td>
<td>83</td>
<td>76</td>
<td>67</td>
<td>58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of testes</td>
<td>80</td>
<td>67</td>
<td>103</td>
<td>80</td>
<td>67</td>
<td>59</td>
<td>53</td>
<td>30</td>
<td>29</td>
<td>15</td>
</tr>
<tr>
<td>Percentage of testes</td>
<td>9</td>
<td>8</td>
<td>12</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cumulative percentage</td>
<td>67</td>
<td>58</td>
<td>50</td>
<td>38</td>
<td>29</td>
<td>21</td>
<td>14</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

The results reveal that the pupils, to be more exact – 95 percent** of them, knew the material well enough to score six points. That means that the pupils should be given a satisfactory mark for a six-point score and, consequently, six points should represent the knowledge of half of the appropriate material. (According to the grade programme a satisfactory mark presupposes that at least half of the material has been learnt). The full amount of appropriate material in this text will be equivalent to 12 points. In other words, judging by the results of this test, the degree of efforts required by the geography programme and the textbook is to be cut by (20–12)/20 · 100 percent = 40 percent.

As we see from the example, the results of a representative test can be easily used to calculate the amount of the study material appropriate for the representative group of students. The calculation can be made more precise if the model of frequency distribution of the test results, especially the end of the smaller values, is used. Let us have another example.

Students of eighth grade scored on average 26.1 points in a test on anatomy in the 1978/79 school year. The standard deviation of their results was 8.1 points and the possible maximum number of points was 42. The results are depicted in Figure 1.
Figure 1. Calculating the optimal amount of the study material relying on the results of a textbook valid test carried out in a representative sample of students.

As in the previous example, I suppose that in our calculations 5 percent of students can have an unsatisfactory mark. I also suppose that the distribution of students is normal. According to the characteristics of normal distribution, 5 percent of the results are always lower than an average result minus 1.64 standard deviations. In our example, 5 percent of the students had a result lower than 26.1 – 1.64 · 8.1 = 12.8 points. The last value should be a boundary line between unsatisfactory and satisfactory marks or, in other words, it denotes a half of the optimal amount of the study material. The optimal amount corresponds to 2 · 12.8 or 25.6 points. Consequently, the amount of study material in the anatomy textbook should be reduced to (25.6/42) · 100 percent = 61 percent of its original amount.

The calculations above can be written in a generalised form as follows

\[ OA = \frac{2(\bar{X} - 1.64\sigma)}{X_{max}} \cdot 100\% \]  

(7.4)

where

OA – the optimal amount of the study material expressed in the percentage from the real amount,
X – the mean result of the representative sample of students in the textbook valid test,
* – the standard deviation of the results,
Xmax – the possible maximum result in the test.
The Formula (1) is open for discussion in many aspects but the idea of calculating the optimal amount of the study material relying on the results of the students' learning is sound. The teachers use the idea in their everyday work: they reduce the amount of the study material if their students cannot acquire it appropriately, and the teachers accelerate learning if their students acquire the material on very high levels. Textbook authors cannot rely on the results of individual students. They must use the results of a representative sample of students.

**Experimental comparison of the quality of two textbooks**

The experimental comparison of two textbooks is based on some indices of the efficiency of the textbooks but the values of the indices depend on a broad variety of factors. Here is a list of some of them.

1. Students: socio-economic status, abilities, motivation, prior-knowledge of the topic, diligence, health, etc.
2. Teachers: professional competence, attitudes towards teaching, diligence, etc.
3. Textbooks: content, comprehensibility, illustrations, learning methods, etc.
4. Tests to measure effects: difficulty of questions, time to answer, etc.

If there are so many factors of the efficiency of learning, how can we decide which part of the results is due to the textbooks and which part is caused by other factors?

The problem can be solved by equalising the conditions of using the two textbooks for comparison. If the conditions are equal, then all the differences in learning results are due to the different quality of the textbooks. However, the simple idea is difficult to put into practice. We will look at it in some details.

There are some possibilities to *equalise the students* working with the two textbooks.

1. Students in both groups should be representative to the whole population of students. This is the most exact and the most expensive way to equalise the groups working with the textbooks for comparison. We have discussed the representativeness above.
2. The same students work with the two textbooks. It is possible if the content of the textbooks is different but usually two textbooks of the same content are compared and therefore the possibility is seldom used.
3. Students' prior knowledge, abilities, and other characteristics are measured and the results of studying the textbooks of those students are considered who match to the students in another group. It means, for example, that the results of some most capable students in the more capable group will not be considered while there are not so many capable students in another group. In this case, the comparable groups of students working with different textbooks will have the same average level of abilities and the same distribution of abilities.

4. An experiment can be carried out in the form of crossing groups (Latin Square). We will discuss it later.

Teachers' characteristics are even more difficult to equalise than the students' ones. In principle, the above mentioned approaches can be used but they are very difficult to realise in practice. For example, composing of two representative samples of teachers for the experiment is almost impossible. Certainly, teachers' professional competence, attitudes, etc. can also be measured and the teachers in two groups matched but I have never read about such practice. The experiment of crossing groups seems to be the simplest possibility to equalise teachers' characteristics working with the two textbooks.

One or more textbook's characteristics constitute the independent variable and textbooks must differ in this aspect. Textbooks may differ in many aspects and then the question arises which of them is crucial in determining different results of learning. To answer the question precisely, the characteristics not under study should be equal in comparable textbooks or their influence should be considered by covariance analysis.

The tests put to students after studying the textbooks should be representative to the textbooks. If the textbooks have the same study aims, then the tests will be the same for both of the textbooks. We discussed the composing of a representative sample of test items in the previous section.

After the short overview of the possibilities to equalise the conditions of working with the two textbooks let us look at the experiment of crossing groups in detail. This experiment is carried out in two parts (Table 2).

In the first part of the experiment textbook I is used by group A and textbook II is used by group B. In the second part of the experiment group A learns using textbook II and group B - textbook I. After completing both parts of the experiment the results of the learning process are assessed. In the whole experiment, textbook I is used by all the students and textbook II is used by the same students. Consequently students’ and teachers’ factors of learning efficiency are even for both textbooks. Differences in learning outcomes are due to differences in the textbooks.
Table 2

Outline of an experiment of crossing groups

<table>
<thead>
<tr>
<th>Part of experiment</th>
<th>Group of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>A: Textbook I</td>
</tr>
<tr>
<td>Second</td>
<td>B: Textbook II</td>
</tr>
<tr>
<td></td>
<td>A: Textbook II</td>
</tr>
<tr>
<td></td>
<td>B: Textbook I</td>
</tr>
</tbody>
</table>

There is some possibility that teachers are more enthusiastic in teaching with the new textbook than with the traditional one. To eliminate the influence, the experiment of crossing groups can be sometimes carried out in one room. Half of the students in the room use a new textbook and the other half uses the traditional one. Teacher's explanations are the same for all the students. In the second part of the experiment students exchange their textbooks.

The experiment of crossing groups is a good method for equalising the teachers' and students' factors in studying textbook efficiency. The method guarantees reliable results even if participants in the experiment are not strictly representative of the whole sample. At the same time, the experiment of crossing groups has a shortcoming. If, in the first part of the experiment, a study skill is acquired from one textbook, then the study skill enhances the results of learning in the second part of the experiment by the students who are using the second textbook. Some positive effect of the first textbook is misleadingly ascribed to the second textbook due to the experiment design. The experiment of crossing groups is not applicable if study skills, motivation or other effects that influence learning outcomes in the second part of experiment are considered. The experiment of crossing groups is usable when the acquisition of knowledge is the main aim of learning.

Let us have an example of using the experiment of crossing groups. The aim of the experiment was to evaluate the effect of using suggestions for understandable writing in Estonian. The investigation was carried out on textbooks of physics for grade 7 (14-year-old students) and anatomy for grade 8. Two chapters from both textbooks (about 80 pages) were rewritten according to the suggestions for understandable writing and the rewritten parts of textbooks printed as booklets. 2167 students participated in the experiment. After the first part of the experiment was over the results of learning were measured and the textbooks exchanged. The indices of the prior knowledge, text comprehension, its acquiring, information gain, and the persistence of knowledge were used to characterise the efficiency of learning. The measurements were repeated after the second part of the experiment. Summary results of the experiment are given in Table 3.
Table 3

Efficiency of suggestions for understandable writing

<table>
<thead>
<tr>
<th>Indicator of efficiency</th>
<th>Level of the indicator (in percentage)</th>
<th>Efficiency percentage*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional textbook</td>
<td>Revised textbook</td>
</tr>
<tr>
<td>Comprehension</td>
<td>64.6</td>
<td>73.1</td>
</tr>
<tr>
<td>Acquisition</td>
<td>55.5</td>
<td>63.0</td>
</tr>
<tr>
<td>Information gain**</td>
<td>40.4</td>
<td>45.9</td>
</tr>
<tr>
<td>Persistence of knowledge***</td>
<td>37.6</td>
<td>40.0</td>
</tr>
</tbody>
</table>

* The percentage is calculated considering the level results in the group working with traditional textbook for 100%.
** The maximum possible information gain is equalled to the acquiring of the text minus prior knowledge.
*** The persistence of knowledge is calculated considering the level of acquiring for 100%.

In the table, we see that all the indicators of learning efficiency are higher when using revised texts. Following the suggestions for understandable writing enhanced learning efficiency by about 13%. All the effects were statistically significant.

Unexpected results of experimental research

Experimental research is aimed at verifying a hypothesis, for example, the new textbook is better than the previous one. Different data are collected and analysed to prove the hypothesis. The analysis is directed by a single goal - the hypothesis. At the same time, the data reflect the richness of the real world, and therefore they depict the other regularities as well. It is extremely useful to look at the data from some other points of view – some unexpected discoveries may be made.

The idea is known as secondary data analysis (Reeve & Walberg 1997) – the data gathered by one researcher for his/her purpose are reanalysed by another researcher to solve his/her problem. To enable the reanalysis, the data should be very well documented and may contain some aspects that are not needed for the first research. The data may function as data banks in sociological research (Anderson & Rosier 1997) accessible for other researchers as well. The data collector may look at them from many points of view and this fosters gathering more information than needed to answer the initial research question.

The first example of unexpected results is related to readability formula
development. Our (the resurs was carried out together with Jaanus Elts and Toomas Tamman) aim was to develop a readability formula for biology texts in Russian. We took 48 texts from popular-scientific books on biology. The texts were about one typewritten page long. The texts were studied by 124 pupils of the 7th, 8th and 10th forms in Russian speaking schools in Estonia. All the pupils were asked to answer questions on the content of the text (to measure their level of prior knowledge), to read the texts, fill in a questionnaire, and answer another set of questions on the content of the text. The questionnaire included questions if the text was interesting for them (2) or not (1).

All the texts were computer-analysed. The analysis included the following aspects. 1. Establishing the distribution of words by their length, the distributions of sentences by their length and by other simple characteristics. 2. The morphological analysis of the words of the texts using programs which had been worked out by N. A. Dartschuk and her colleagues in Kiev (Automatisation …, 1984). The morphological analysis determined the principal form of every word in the text, the part of speech to which the words in the text belonged and their frequency of occurrence. 3. The frequency rank of the words in our texts was established by comparing them with the entries of the frequency dictionary of Russian which we had been given by D. Buchstab from Moscow University. 4. As the abstractness of nouns and the number of terms in texts greatly affects text comprehension, the degree of abstractness of every noun in the text and their role as terms in the text were assessed by human experts (Elts 1992).

The arithmetical mean values of the pupils’ answers were correlated with the characteristics of the texts. Some of the correlation coefficients have been presented in Table 4.

The aim of our research was to find the correlation coefficients given in the last column of Table 4. The correlation coefficients met our expectations. The computations on computer are easy and we calculated the correlation coefficients in the last but one column as well. The coefficients bewildered us! For example, the first of them (-0.53) means that before reading the text, the students answered fewer questions correctly on the texts that had longer sentences. How can it be? How did the students know in which texts the sentences were longer and answered fewer questions correctly before reading the texts? It can not be! Our experiment has fully mysterious results! No scientific conclusion can be drawn!
### Table 4

**Validity of some text characteristics in predicting reading outcomes**

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristic</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Correlation coefficient* with Interest in reading score No. 202</th>
<th>Pre-test score No. 210</th>
<th>Post-test score No. 212</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Proportion of sentences of 40 or more letter spaces**</td>
<td>0.92</td>
<td>0.10</td>
<td>-0.55 -0.38 -0.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Proportion of sentences of 70 or more letter spaces</td>
<td>0.76</td>
<td>0.20</td>
<td>-0.68 -0.48 -0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Proportion of sentences of 80 or more letter spaces</td>
<td>0.69</td>
<td>0.22</td>
<td>-0.71 -0.51 -0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Proportion of sentences of 90 or more letter spaces</td>
<td>0.61</td>
<td>0.24</td>
<td>-0.70 -0.53 -0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Proportion of sentences of 130 or more letter spaces</td>
<td>0.36</td>
<td>0.23</td>
<td>-0.62 -0.34 -0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>78.</td>
<td>Proportion of words of 9 or more letters</td>
<td>0.26</td>
<td>0.07</td>
<td>-0.76 -0.53 -0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.</td>
<td>Number of letter spaces in sentence</td>
<td>119</td>
<td>36</td>
<td>-0.66 -0.44 -0.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>91.</td>
<td>Number of letters in word</td>
<td>6.3</td>
<td>0.6</td>
<td>-0.75 -0.54 -0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>97.</td>
<td>Frequency of the text’s words in the SLD***</td>
<td>968</td>
<td>205</td>
<td>0.55 0.37 0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>103.</td>
<td>Frequency of the text’s nouns in the SLD</td>
<td>26.6</td>
<td>17.2</td>
<td>0.50 0.58 0.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>104.</td>
<td>Repeating rate of the nouns in the text</td>
<td>1.35</td>
<td>0.13</td>
<td>-0.48 -0.42 -0.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>109.</td>
<td>Percentage of nouns in the text</td>
<td>34.8</td>
<td>5.0</td>
<td>-0.63 -0.49 -0.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>233.</td>
<td>Mean terminological index of nouns</td>
<td>1.53</td>
<td>0.24</td>
<td>-0.64 -0.45 -0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>236.</td>
<td>Percentage of abstract nouns</td>
<td>23.6</td>
<td>16.0</td>
<td>-0.70 -0.49 -0.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>242.</td>
<td>Percentage of terms which are not used in everyday speech</td>
<td>13.4</td>
<td>11.2</td>
<td>-0.71 -0.54 -0.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation coefficients with the absolute value 0.29 or above are statistically significant at 0.95 level.

** Letter spaces are all letters, punctuation marks, and gaps between words.

*** SLD – spoken language dictionary composed in Moscow University by Buchstab and colleagues.

It took a year to understand the correlation coefficients. The correlation
coefficients are based on the fact that some topics are better known in society than others. If a topic is known, then people write about it in shorter sentences, using more familiar and less abstract words. Also students know the topic better and give more correct answers before reading the text that the author has written in a simpler way. Both of the correlated characteristics - the level of correct answers before reading the text and the readability level of the text, have one predictor variable – the familiarity level of the topic in society. Or in other words, readability formulae measure the level of familiarity of the text content to the readers to a certain degree.

Afterwards we divided the biology texts into three categories: texts about microbiology, organisms and ecology. The texts on organisms had, on average, the shortest sentences, the shortest words, the more words frequent in everyday speech, and the least abstract words. The same texts were evaluated as most interesting among the three categories of the texts and the students could give the best answers to the questions about their content before reading the texts (Elts & Mikk 1993).

Analysing the data of the above described experiment, we paid attention to the fact that the coefficient of correlation (in the last column of table 4) changed systematically if the dividing line between the short and the long sentences changed. The correlation coefficient between the results of the post-test score and the percentage of long sentences was low (in absolute value) when the relatively low value of sentence length was taken as the dividing line between the short and the long sentences. If we moved the dividing line from the short sentences to the longer sentences, then the correlation coefficient first rose to the maximum (-0.75) and then began to decrease. What might be the reason for these systematic changes? Answering the question, we found a new and exact method to elaborate the optimal value of sentence length for different students (Elts & Mikk 1996). These examples prove that unexpected results of experiments may be even more important than the initial aim for collecting data.

Conclusion

What really matters is the efficiency of using textbooks at school. The results can be most validly measured by experiments in schools. Therefore the experimental method of measuring textbook quality deserves the special attention of textbook researches. The experimental method is even more important because it enables to validate the different ways of textbook analysis, and experts also rely on the results of field testing in formulating their opinions about textbooks.
The experimental method is the most complicated method in textbook research. The researcher has to think about the representativity of students' groups, or about their equality, about the validity of experimental design and measurements etc. The ideal conditions can hardly be achieved for different reasons, or as M. J. Lawson (1977, 133) put it: "Experimental design requires juggling of ideals and practicalities". The more deviations from the ideal, the less valuable are the results.

An experiment is the most expensive method of textbook investigation. It should be used after the textbook analysis and the removal of the shortcomings which were elicited in the analysis. Otherwise in the experiment we give the students a textbook with shortcomings that hinders their development and this contradicts the ethical norms of educational research.

Usually the measurement of textbook efficiency is many-sided in experiments: content tests, questionnaires to teachers and students, the survey of students work, etc. The collected exact and thorough data enable the researcher to solve different problems and sometimes serve as a basis for unexpected discoveries.

**Bibliography**


A Framework for Assessing the Quality of Learning Materials

Assessing the quality of any product implies that we have a clear picture of the functions of that product. It is not fair to evaluate a refrigerator in terms of its acceleration power. Refrigerators have other functions than cars have.

So it is with learning materials: it is important to know what functions they have in order to be able to evaluate their quality. Among others, learning functions are the main functions of learning materials. What learning functions learning materials have depends on different aspects: the target group, the curriculum domain, the sort of textbook, the way teachers want to use the material. There are also other agents which enable a learning process: teachers, peer pupils, and learners themselves.

With these thoughts in mind we are carrying out a project which enables us to give hallmarks to learning materials, specifically textbooks. CLU has been asked to develop that hallmark for learning materials for one of the largest educational organizations in vocational education in the Netherlands. The hallmark functions as an instrument to assess the quality of learning materials.

In carrying out that project we had the following premises:
1. A hallmark must fit the different learning situations in which learning materials function
2. The instrumentation to be developed must be based on recognizable and relevant indicators for educational publishers, authors and teachers, and
3. Be based on objective and reliable procedures and methods.

In this article I will discuss those three premises

**Different learning situations foster different learning materials**

Learning materials function within different learning situations. Compare for instance the different learning situations of a kindergarten schoolclass on the one hand, and of the adult distance learner on the other. These diffe-
### Survey of learning functions

<table>
<thead>
<tr>
<th>Learning functions</th>
<th>Before</th>
<th>During</th>
<th>After</th>
</tr>
</thead>
</table>
| **Cognitive**      | * activate prior knowledge  
* present information  
* present instruction | * construct knowledge  
* practise skills  
* put information in a context  
* formulate conclusions  
* relate to passed learning  
* practice applied conditions and possibilities  
* dialogue with the instruction  
* relate to the real world | * product assessment  
* process assessment  
* reflect on objectives |
| **Affective**      | * present objectives  
* explicate objectives, make eager  
* give objectives a place in the context  
* challenge  
* arouse interest  
* focus attention  
* explicate relevance | * monitor concentration  
* keep up motivation  
* search feedback | * judge  
* attribute learning results to learning strategy use  
* reflect on feedback |
| **Regulative**     | * orient on objectives  
* choose and determine (sub)objectives  
* choose learning strategy | * monitor the progress  
* monitor the learning process  
* correct learning strategy  
* cooperate  
* initiate new instructions | * evaluate  
* reflect on the learning process |
rent learning situations foster different learning materials, because their learning functions differ. To assess the quality of learning materials it will be necessary to define the specific learning functions these learning materials have to realize.

Let’s have a closer look therefore at different learning functions of learning materials. Learning functions can be described as psychological functions that have to be met by a learner to enhance learning activities which makes learning happen. Those functions can be supported or realized by different learning agents: a textbook, a teacher, a peer learner, Internet, and of course the learner himself or herself. We distinguish learning functions along two dimensions.

The first dimension concerns the different psychological functions: cognitive, affective and regulative (metacognitive) learning functions.

The second dimension is about the learning process: there are learning functions which are important before, during and after a learning process.

So we get 9 main kinds of learning functions. The table on the next page shows those 9 different kinds of learning functions and the specific functions within a cell.

As stated earlier: learning functions are not only realized by learning materials, but also by teachers, peer students, and by learners themselves; different learning materials even differ in the way they can realize certain learning functions.

Which of the above given learning functions learning materials are considered to realize depend on certain variables in the learning situation, of which the most important are:

a. the potentiality of the learning materials themselves: written materials have other characteristics than electronic media have (f.i. interactivity, reality-power)
b. the characteristics of the learners (e.g. learning potentials, motivation)
c. the characteristics of the teachers (e.g. classical versus individualized instruction)
d. the characteristics of the curriculum domain (e.g. knowledge oriented versus skills oriented)

In developing a hallmark for the above mentioned educational organization in vocational education we only develop a hallmark for written materials. It is however expected that this hallmark will be followed by a hallmark for electronic media.

Using those four above mentioned variables, we developed different standards based upon analysis of the used written materials and taking interviews with the educational publishers of those materials and with teachers who used those materials.
Here are the different standards:

**Kind of learning material**
We distinguish the following four different types of textbooks which have different learning functions:
1. Theory books: these are textbooks that contain only theory
2. Theory-based books: these are textbooks presenting theory followed by questions and assignments
3. Assignment-based books: these are textbooks which in fact are assignment-driven, the assignments may though refer to theory
4. Workbooks: these are textbooks in which mere questions and assignments have to been filled out, there is no theory in them.

**Mastery level**
There are three distinctive mastery levels for the pupils:
5. Assistent level
6. Apprenticeship level
7. Master level
The levels mainly differ in complexity of the tasks and in the degree to which pupils have to master them autonomously. It is expected that each level requires different learning materials.

**Curriculum domain**
Within the curriculum field of the specific vocational educational system, there appear to be three different curriculum domains:
8. Knowledge based vocational modules (e.g. “Marketing“)
9. Skills based vocational modules (e.g. “Written Correspondance“)
10. Foreign languages and mother tongue
Each of those domains requires other types of textbooks.

**Modalities of use by teachers**
In our investigation of how the teachers use textbooks we encountered three different ways:
11. Classical use (teacher-based: the teacher determines the entire learning process)
12. Independent use (learner-based: the learner determines the entire learning process)
13. Guided use (mixed-based: the preparation of the learning process and the feedback are teacher-based, whereas the learning process itself is strongly learner-based)
So we come to a maximum of 13 standards or hallmarks.
In the next phase of the project we will have to find out which specific learning functions fit with which specific standards.

**Recognizable and relevant indicators for educational publishers, authors and teachers**

On the basis of the interviews with publishers, authors and teachers we developed 18 different indicators for assessing the quality of written learning materials. Here they are:

**Content**

1. Accordance of the curriculum with the exam requirements
2. Accordance of the assignments, build-up level based, with the taxonomy codes
3. Correspondence of the curriculum to meaningful contexts
4. Recognizable formulation of objectives
5. Correctness and actuality of the informational texts
6. Structure and coherence of the curriculum
7. Concept of man in accordance with the Universal Declaration of the Human Rights

**Pedagogy**

8. Accordance of the didactic model with recent psychological insights in learning (e.g. knowledge building by knowledge construction)
9. Possibilities for differentiation in instruction, speed, assignments
10. Accordance of assignments with the objectives
11. Accordance of assignments with recent psychological insights (active learning, authentic learning, cooperative learning, interactive learning)
12. Accordance of instructional procedures with recent psychological insights (aspects of direct instruction: focusing attention, giving feedback, reflection)

**Materialization**

13. Functional and attractive use of lay-out
14. Functional and attractive use of illustrations
15. Functional and attractive use of page-elements
16. Readability of sentences
17. Accessible ordering of the texts
18. Quality of the physical aspects of the material

In the next phase of the project we have to find out which specific learning functions fit with which specific indicators.

3. **Objective and reliable procedures and methods**

For the convenience of the acceptance of hallmarks by publishers and teachers, it is not only sufficient that they recognize the relevance of the above-mentioned indicators. Also the procedures and methods to be used in assessing the quality of learning materials must be taken into account. That means that the following procedures and methods have to be developed:

– a procedure for accepting an order to give a hallmark to a certain textbook (who is in charge to accept, who is going to assess the quality etc.)

– a procedure for assessing the quality of textbooks (we will use: objective analyses of the material, judgements by teachers and students, judgements by curriculum experts)

– a procedure for giving or refusing the hallmark (also the way in which a publisher can protest against the decision)

– a procedure for editing the assessment-information

– description of the way in which the information will be gathered with respect to the different standards (type of book, mastery level, curriculum domain, use modality), and the way that has to be determined (which textbooks belong to which curriculum domain)

– comprehensive description of the way the information will be gathered:
  - the evaluation instruments
  - an instruction for analysing the items (with examples)
  - an instruction for the way the expert evaluations will be asked
  - the way how to sample texts passages per item or indicator
  - how to score and weigh the information
  - a key for scoring hallmarks per standard

– a description of the way how the results are reported with a report-format.

In the next phase of the project we will further operationalize these procedures and methods.
The availability of good quality textbooks facilitates any curricular reform. Like many other countries, the Netherlands have a free textbook market, where 28 educational publishers produce the bulk of textbooks available on the Dutch market on a commercial basis. It is up to school teams to make a selection from this offer, and by doing so, to give shape to the (new) curriculum in their classrooms.

Selecting textbooks means assessing their quality. But what is a good textbook? In this article we will describe a project carried out in the Netherlands to support the selection of new textbooks for upper secondary education. In order to provide school teams with tools to select and assess the quality of new educational materials the project team developed a procedure to generate comparative, objective information on the new textbooks. The procedure, although generally applicable to all subjects, was applied to all modern language textbooks available and resulted in a textbook selection tool for teachers, published in the monthly journal of the Association of Teachers of Modern Languages in the Netherlands, under whose auspices the project was carried out.

We will start by describing the context in which the project was carried out against the background of curricular changes in upper secondary. Then we will present the procedure we applied, and the methodological choices we made, and finally conclude with the results of the analysis on some particular, selected aspects.

Curricular changes

In the last decade new pedagogical concepts have entered the curricula of many countries. Concepts like life-long learning, problem solving and autonomous learning have shifted the focus away from reproduction of factu-
al knowledge conveyed primarily by teacher’s instruction towards more student participation, the role of the teacher changing into that of a tutor supporting the autonomous learning process of the students. These new concepts are also key-features of the new curriculum in the curricula of all school types in the Netherlands.

It started with primary education in the late eighties to continue with the new curriculum of lower secondary education, which was introduced in 1993. The new curriculum for upper secondary education was introduced in September 1999, and all schools were faced with the selection of textbooks suitable for realising the objectives in the new curriculum. Educational publishers reacted with a flux of new course packages, 110 altogether for all subjects in upper secondary.

As for the new curriculum in upper secondary education the Association of Teachers of Modern Language in the Netherlands took the initiative for a national project, in which almost all the new modern language textbooks were analysed. The project resulted in a publication of comparative analyses serving as a tool for teachers in the textbook selection process. The project started in March 1998 and was finished in December 1998, just in time for the textbook selection process for the new school year in September 1999.

The materials analysed

In our procedure to generate objective comparative information on educational materials for upper secondary we focused on the so-called course packages for modern languages, i.e. Dutch, French, English and German. It is quite remarkable that, although the new curriculum stimulates an environment of autonomous learning, where pupils do their own research and gather their own information, that educational publishers increase their production of all-in course packages, consisting of textbooks, workbooks, tests, educational software, teacher’s guides etc.. On the other hand this is quite understandable. When there is a large-scale curriculum reform implying new curriculum content and new pedagogical subjects course packages are a first attempt to translate the new curriculum for classroom practice. Quite a lot of new course packages were produced for the new curriculum of upper secondary, seven for Dutch, seven for French, seven for English and eight for German. As not all the packages were completely available at the time when the analysis had to be carried out, we limited ourselves to the components of the package for the fourth grade of pre university education. Another practical limitation was the fact that there was no practical experience with working with the materials at that time.
The choice of a methodology

Quantitative versus qualitative methods

Within intrinsic textbook analysis we can distinguish quantitative and qualitative methods. Departing from the point of view that the results of textbook analysis should be reliable and valid', we will first describe the advantages and disadvantages of both methods, and then explain how we combined the advantages of both in our own research project.

In the use of quantitative methods countable elements or patterns of elements in the textbook are registered. The more unambiguous these elements are the more reliable the results of the analysis will be. There is, however, a question of validity: will these results lead to relevant statements on the quality of the textbook? Coherence within texts often remains undetected, so does implicit content or meaning. Nor can we draw conclusions on the importance of these elements without complex rules how to weigh different elements. A textbook element with a lower frequency does not necessarily have to be less important. An element or learning task, even if it is only mentioned once, can function as a generative element, with a strong impact on learning, that it becomes very important.

In qualitative research methods, on the other hand, the analysis aims at meaningful statements on the textbook. A strictly systematic approach and the possibility to replicate the results are subordinate to this aim. It is the task of the researcher to ‘interpret’ the complexity of the meaning of textbook qualities and to make it understandable. The central aim of the qualitative approach is to understand meaning and after that to search for structure and classification of its elements. The analysis takes into account the context of the content elements, hidden meaning, the presence or absence of meaning, and eventually the significance of content elements, also if they only occur once.

Of course there are also some points of criticism with respect to qualitative methods of textbook analysis. The main point of criticism is the impressionistic character of the method and the lack of a systematic approach.

Mayring (1988) tries to combine the best of two worlds and presents a structural qualitative approach. In this approach he combines the strengths of both methods, a systematic approach, where results are verifiable and meaningful. In this approach textbook content is structured on the basis of a generally accepted frame of reference, which for the purpose of analysis is ‘translated’ into a systematic and reliable instrument of analysis. The analysts search for the contents laid down in the instrument (criteria) and register them. Evaluation takes place by rating the occurrence of the contents found on an ordinal scale, for instance much-moderate-little-partly present.
**Delphi procedures**

It is self evident that for both quantitative and qualitative methods the reliability and the validity of the results depend on the frame of reference the researchers use for the analysis. To account for the complexity of textbook quality, the reliability and validity of the results also depend on the quality of the researchers who carry out the analysis. They should be experts in the research field.

Therefore, for our study, in which we tried to predict the quality of modern language text books in the light of a new curriculum, we developed a shared frame of reference based on the new curriculum and the examination programme. For this purpose we developed a variant to Mayring’s structural qualitative approach (cf. 3.1), which does not only account for content but also for the methodological approach of the textbooks involved.

For the analysis a Delphi procedure seemed the most adequate technique for our purposes and the situational constraints we had to face.

Delphi procedures started as a variant of questionnaire survey studies (Borg & Gall, 1983, 413-415). The main aim of a Delphi procedure is to obtain a consensus report from persons who are experts on particular issues. The basic technique is sending a questionnaire to a panel, making them fill it in individually, determining the median score, and in a second questionnaire, asking the panel to compare their original score with the median score, and to revise their score as they can agree. This procedure is repeated several times, trying to obtain a well-thought-out consensus.

Based on this general framework many variations have been applied. In some cases, the researchers ask for arguments explaining deviating scores, which are then added to the questionnaire in the next round. Sometimes the procedure consists, for these same reasons, not only of mailed questionnaires, but also of panel discussions, in which arguments for scores or rankings are discussed.

One of the main advantages of the Delphi technique is striving for a well discussed and well founded consensus on the potential of textbooks to realise the new curricular objectives. The quality of the results depends on the quality of the panel, and the way the discussion is guided and information from former rounds is inserted in the procedure. The procedure requires a considerable amount of time from the members of the panel. In return, the members of the panel learn by their involvement in the discussion, dependent again on the quality of composition the panel.

Delphi techniques seemed a natural method of analysis for our purpose, because they simulate the textbook selection process of school teams, where on the basis of a discussion the team has to reach a consensus on the adoption of a new course package. We composed panels of experts consisting of
professionals concerned with the quality of textbooks: teachers, methodologists and scientists. As a sort of a super motivated school team these panels were going to discuss the new textbooks with an instrument of analysis, and were going to reach a consensus on the innovational potential of the textbooks. With this procedure we could reach results based on intersubjective perceptions from different professional backgrounds.

The development of a common frame of reference

In order to account for the comparability and transparency of the results we developed an instrument allowing for systematic analysis, the new curriculum serving as a shared frame of reference.

First of all each course package was analysed by five panel members independently. The members of the panel estimated the number of elements, using a five point scale for all the items in the instrument derived from the examination objectives and major trends in methodology, the question for each item being: the course package contains very little, little, much, very much of each particular item. But although this terminology suggests that the analysis was just based on quantity the reality was different. Take for example the reading skills. The panel did not just estimate the number of texts the package contained, but rather the number of texts accompanied by assignments meeting the examination objectives. They would for instance look for assignments aiming at eliciting relevant information from a text related to a certain need of information, or assignments enabling students to extract the main ideas from a text. In short, panel members estimated the number of certain, well-defined elements.

So, the item on reading skills in the frame of reference was formulated as follows:

---

**Item 1: Analysis of textbooks: Reading component**

The textbook contains:

a. Exercises to indicate whether a text contains relevant information, given the information need;

b. Exercises aimed at the identification of the main idea of the text, at the construction the meaning of important sections, at building relations between sections of the text, at generating conclusions from the text;

c. Various types of reading tasks

d. Various text types

The four elements from this item (a-d) all came from national curricular document and examination programmes.
So this way of scoring allowed for conclusions about the quality of the packages in relation to the new curriculum.

In three sessions, spread over six weeks, we discussed the scores of the individual panel members, especially those deviating more than one point from each other. In the discussion the panel members had to deliver arguments for their scores and eventually had to come to a consensus or a compromise mostly resulting in an adapted score. Following this procedure, we strove for consensus, reached by argumentation and discussion. These texts’ were to accompany the quantitative scores in the report: some scores could have been reached by different arguments and discussions: the world behind the scores was also reported.

Summarising we can say that we developed a frame of reference based on the new curriculum. The results of the analysis were expressed in quantitative terms. The items in the frame of reference, however, contained qualitative characteristics. As we wanted to cover a whole set of educational objectives in the curricular documents and the examination programmes, the items in the frame of reference allowed for deviating perceptions. Using a Delphi procedure we selected a team of experts who discussed the deviating scores. On the basis of this discussion the scope of interpretation in the frame of reference was narrowed, which led to an adapted frame of reference. The professional quality of the members of the panel allowed us to confine ourselves to an estimation of the quantity of occurrence of the different items rather than making an exact count.

**The three perspectives of analysis**

In the development of the instrument for analysis the new curriculum served as a shared frame of reference. The modern language curriculum is formulated mainly in terms of general skills and specific language skills pertaining to reading, listening, speaking and writing. Apart from the examination objectives pupils are also supposed to acquire certain learning experiences in the four language skills outside the exam programme. Before entering the exam they will have to give evidence that they have extensive reading and listening experiences, and learning experiences pertaining to the other language skills. We wanted to base our analysis on the whole of the new curriculum anticipating on the teachers’ need to get information on all the innovational aspects. This forced us into a broad overall analysis rather than an in-depth-analysis on selected aspects of the curriculum. The analysis was approached from three different perspectives.
1. The perspective of content
This perspective consisted of three sub-aspects.

- In the first place all the items from the examination programme were listed that related to the language skills including grammar and vocabulary.

So for reading skills we asked among other things:

<table>
<thead>
<tr>
<th>Example Item 1: Analysis of textbooks: Reading component</th>
</tr>
</thead>
<tbody>
<tr>
<td>The textbook contains:</td>
</tr>
<tr>
<td>a. Exercises to indicate whether a text contains relevant information, given the information need;</td>
</tr>
<tr>
<td>b. Exercises aimed at the identification of the main idea of the text, at the construction the meaning of important sections, at building relations between sections of the text, at generating conclusions from the text;</td>
</tr>
<tr>
<td>c. Various types of reading tasks</td>
</tr>
<tr>
<td>d. Various text types</td>
</tr>
</tbody>
</table>

The four elements from this item (a-d) all came from national curricular document and examination programmes

- Secondly we asked whether the package presented a realistic picture of the countries where the language was spoken. Texts and illustrations should depict a representative and realistic picture of the country, and thus contribute to intercultural learning.

- Thirdly we asked if the content reflected the state of the art with respect to the current scientific discussion. This aspect was only included in the instrument for the subject Dutch. We asked whether the content was correct and up-to-date and whether the package represented what we know about writing processes and argumentative structures of texts, about how to distinguish a statement from an argument.

2. The perspective of methodology
This perspective consisted of four sub aspects.

- Does the package contain (very few, few, not few-not many, many, very many) exercises and tasks which facilitate the student’s development towards a competent language user. We added three elements to look for: authentic (albeit simulated) communicative tasks, assignments for orientation and reflection on the process and the product of the task.
• Does the package present (very few, few, not few-not many, many, very many) exercises and tasks that facilitate strategic language teaching and learning? Does it teach the students strategies to find out about things they cannot understand in texts of oral communication? We added three elements to look for: support during the process of writing and speaking, the process of analysing, interpreting and evaluating written and oral texts, the choice and the use of resources and media.

• For methodology of transfer we asked: Does the package contain (very few, few, not few-not many, many very many) texts, tasks and/or exercises which facilitate that students relate their learning to knowledge and skills of
  – other parts of the language curriculum (i.e. relating writing to reading, or speaking to writing),
  – other school subjects (i.e. relating the language curriculum to geography, history) or to
  – other communicative situations (i.e. relating what is learnt to what was learnt before (backward transfer) or to
  – new communicative or learning situations (forward transfer).

• For the methodology of ‘learning to learn’, we asked the question: Does the package contain (very few, few, not few-not many, many, very many) exercises and tasks that enable students to (learn to) grow towards ‘autonomous learning’. Because of the newness of this paradigm in the Dutch curriculum, we added a rather long description of the different stages to reach autonomous learning, based on an analysis by Mulder & Bonset (1997). We also provided panellists with a checklist from the same authors. This checklist requires from analysts to assess who (student only, student and teacher, teacher only) can make choices in planning the learning process, in executing the learning task, and in regulating the learning process (who regulates the learning process, who delivers feedback on process and on product of learning, who evaluates the quality of learning)?

3. The perspective of practice
This perspective consisted of the following sub-aspects.
• User friendliness for the teacher, meaning that the package should be complete including a teacher’s guide. It should contain suggestions for planning and for teaching lessons adequately in the context of the new examination programme.
• User friendliness for students, meaning that the package should be easily accessible containing user’s guidelines, a list of contents, a register etc. The language and instruction should be clear. The layout should support adequate use. Tasks should be designed in such a way that they can be carried out autonomously.

• Attractiveness for teacher and student, meaning that the content should be geared to the interest of students, there should be a variation in learners’ activities, working methods and the use of media.

• Differentiation, meaning that the package should give possibilities to differentiate according to level, working speed, interest etc.

• Tests and evaluation, meaning that the package should give suggestions for the organisation of the school exam. It should contain tests with a variation of questions and assignments and suggestions for the preparation for the examination.

**The instrument**

The instrument consists of the following elements:

1. A Manual, containing a description of all aspects (see above) and some guidelines for interpretation.


3. A form to assess the panels’ needs (the relative importance of the items from the manual).

4. Forms to describe and evaluate the package (see one of these forms below).

Some words about this last form. The members of the panel scored their results on a five point scale for all the items in the instrument derived from the examination objectives, the question for each item being: the course package contains very little, little, much, very much of each particular item. This terminology suggests that the analysis was based on purely quantitative aspects. But in fact quantitative and qualitative aspects were combined. Take for example the reading skills. The panel did not just count the number of texts the package contained, but rather the number of texts accompanied by assignments meeting the examination objectives. They would for instance look for assignments aiming at eliciting relevant information from a text related to a certain need of information, or assignments enabling students to extract the main ideas from a text. So this way of scoring allowed for conclusions about the quality of the packages in relation to the new curriculum.
The example below shows that we also collected qualitative data. Panel members were asked to write three short sentences (‘one liners’) to express their feelings about the package, and to select one strong and one weak point. In the two columns on the right, they could add deliberations about their scoring. Sometimes they felt an item was not adequate (for instance about testing) because the materials of the package were not complete. Sometimes analysts had problems with scoring because of the heterogeneity of the materials.

**Results**

As we mentioned before the results are based on a broad overall analysis. One of the reasons was that the instrument covered the whole of the new curriculum, and furthermore the time for analysis was limited. We did not allow more than six hours for the analysis of one course package. This is quite authentic, because in a real textbook selection procedure the time of the school team will also be limited. The results are relative in two ways. First of all they are related to the panels’ need assessment, secondly they are related to the representation of the individual items in other textbooks. So the ideal textbook in an absolute sense does not exist.

The three perspectives from which the analysis was approached show that the instrument was rather elaborate and extensive. In the following paragraph we will show some of the results exemplified by one item from each of the three perspectives.

**The Panels’ needs**

After we had made our first inventory of examination objectives to develop the common frame of reference we asked the panel members to indicate their need with respect to the individual items in the framework. How important was it to have an abundant representation of the individual items of the instrument in the course package? They had to score their needs on a five point scale analogue to the scores for the analysis. The scores ranged from 1 (very little) to 5 (very much). The individual scores were collected, processed and presented in a graph. Then they were given back to the group who discussed large discrepancies, arguments and interpretations were exchanged. This phase led to a common frame of reference. After all the discussions on the course packages had taken place we asked the panel members again to state their needs with respect to the representation of the individual items in course packages. The results are shown in the following diagrams.
It is quite obvious that the panels English, German and French agree that
textbooks should contain many texts and assignments for the development
of reading skills, oral communication, vocabulary and listening. Writing
and grammar were regarded less important.

As we mentioned before, there is another type of learning objective, the
so-called learning experience. Students not only have to acquire a certain
level of reading skills, but they also have to have done some reading on
their own, outside school. The same holds for listening, oral communica-
tion and writing.

The results show that the panels for English and German agree that the
textbook should offer a fair amount of material to support these learning
experiences. The panel French on the other hand decided that these types of
tasks should not be included in textbooks, because they ask for fine tuning
with particular classes and particular circumstances. The German panel took
the opposite view. They argued that course packages should contain many
of these texts, assignments and suggestions, because otherwise teachers
would skip these new, but important requirements.
The content perspective: Reading skills

Figure 3: Quality of textbooks: Reading skills

In their need assessment all four the panels agreed that they wanted text and assignments supporting the development of reading skills abundantly represented in textbooks. As the histogram shows, most of the textbooks for all the four subjects approximately meet these requirements. Three textbooks French, two textbooks German and one textbook English do not meet them.

The methodological perspective: autonomous learning

Figure 4. Quality of textbooks: Autonomous learning
Assignments supporting autonomous learning in textbooks had to do not only with clear instructions, but also giving choices to students with respect to the planning the execution and the evaluation of the task. As we can see in the histogram above many of the textbooks do not quite meet the requirements of the panels as far as the realisation of autonomous learning is concerned. Two books for French, two for German and one for English are really below the standard set by the panel.

*The practical perspective: teacher friendliness*

![Histogram showing quality of textbooks: Teacher friendliness](image)

Figure 5. *Quality of textbooks: Teacher friendliness*

Also for user friendliness the panels had set quite a high standard. They wanted the course package to be complete including a teacher’s guide. It should contain many suggestions for planning and for teaching lessons adequately in the context of the new examination programme. The panel English only assessed one textbook with regard to user friendliness, because they did not want to analyse this aspect without the teacher’s guide being available.

The histogram shows that some course packages reach the level the panel required, but on the other hand some packages for French, German and Dutch got a low score.
Summarising conclusions

In spite of the limitations we faced in this procedure – the broad overall analysis combined with a limited time for analysis and with the course packages not yet completely available – we still hold the procedure valid to produce quick, comparative textbook information, at a time when it is needed. By publishing the panel discussions together with the quantitative scores we provided school teams not only with comparative quantitative information, but also with argumentation and interpretation to back it up.

Both the instrument of analysis and the publication of the discussions provide a model for the textbook selection process in school teams. When teachers choose a new textbook, that is the moment when they take the time to reflect on their educational practice and their views on education.

The instrument gives them a framework by offering the content that should be talked about in relation to the new curriculum.

References


A critical analysis of foreign language learning tasks

Summary
Our research project examines the critical analysis of learning tasks used in the foreign language classroom. The main objective of the project is to develop a critical attitude towards foreign language learning tasks on the part of the foreign language teacher. To this end, the project seeks to improve the ability of (trainee) foreign language teachers to analyse the effectiveness of printed classroom learning tasks in the acquisition of foreign language communicative competence. The paper intends to give the reader some insight into the what and how of critically analysing these tasks. The paper starts with the global discussion of a theory-based model underlying this analysis. The notions of learning activity and learning action, central to the model, are explained and concrete examples are provided. Next, the paper focuses on one category of learning tasks by sketching questions for the analysing of tasks oriented towards reading strategies. The paper ends with the presentation of an analysis of a German learning task, in which learners have to guess unknown words from context.

Introduction
Recent educational developments in the Netherlands, such as the implementation of a basic core-curriculum in the early years of secondary education and the so-called Studyhouse (the new curriculum in upper secondary education) focus on learning activities of learners within rich learning environments to be provided by teachers. Teachers, then, need to develop a critical attitude towards learning tasks to be carried out by their pupils.

According to the report “Horizon Taal“ (van Els, 1990), published by the Dutch National Action Program of Foreign Languages, trainee foreign language teachers have gained too limited an ability to critically analyse
learning materials. The report recommends foreign language educational training institutes to train their students more extensively in critically handling learning materials.

The report has led Westhoff and three foreign language teachers to conduct a preparatory study (Westhoff, 1996) in order to investigate the possible applications of a qualitative materials analysis by foreign language teachers. The relevancy of this study to the current research project is threefold.

Firstly, the study has laid down a theoretical basis for the critical analysis of learning tasks by detailing three indicators of the effectiveness of learning tasks: the learning action to be executed, the assignment to elicit the learning action and the materials involved. Next, the study has developed an instrument for the critical analysis of vocabulary tasks, which we consider a promising starting point for our study. Finally, the study has investigated the potential learning effect of the instrument on the part of foreign language teachers. The study found some indications that training sessions spent on the analysis of vocabulary tasks made foreign language teachers more critical towards learning tasks.

Our research project is meant to explore the potentially supportive role of a theory-based model in the critical analysis of learning materials. The following research questions have been formulated:

1) Is it possible to construct a model, based on theory and research on the acquisition of foreign language communicative competence, for the analysis of the effectiveness of printed foreign language learning tasks?

2) What is the validity of this model?

3) What are the characteristics of effective training sessions based on this model and aimed at improving the ability of (trainee) foreign language teachers to analyse the effectiveness of printed foreign language learning tasks?

4) What is the learning effect of these training sessions: does the ability of (trainee) foreign language teachers in analysing the effectiveness of printed foreign language learning tasks improve as a result?

The effectiveness of foreign language learning tasks

In our research project, we view the critical analysis of foreign language learning tasks as the analysis of the effectiveness of foreign language learning tasks. As stated earlier, the effectiveness of foreign language tasks consists of three aspects: the learning action to be executed, the assignment eliciting the learning action and the materials involved.
Foreign language learning tasks are tasks requiring the student to process or produce the target language in order to acquire or consolidate her communicative competence in the target language. Such tasks are part of the curriculum at the micro-level (learning materials, teaching package or textbook/workbook), which is to be distinguished from the curriculum at respectively the middle-level (school work plan) and the macro-level (school curriculum). Tasks exist in printed and non-printed form (e.g. educational software).

The task analysis we aim at in this research project is qualitative in nature and in the literature is known as a prospective evaluative analysis. A prospective evaluative analysis starts from theoretical assumptions.

The model underlying our task analysis consists of five parts:
1. the model formulates and describes learning activities relating to the acquisition of foreign language communicative competence.
2. the model formulates and describes learning actions into which these learning activities can be realised.
3. the model formulates questions for the analysis of the effectiveness of the learning action(s) intended by the learning task.
4. the model formulates questions for the analysis of the effectiveness of the assignment(s) in the learning task.
5. the model formulates questions for the analysis of the effectiveness of materials added to the learning task.

In this paper we choose to focus on the first three parts of the model.

**Learning activities in classroom-based foreign language learning**

In this paragraph, we discuss theoretical positions on second language acquisition that have led us to distinguish between a number of categories of learning activities that will be discerned in the remainder of this paragraph. These learning activities all focus on the acquisition of communicative foreign language competence in a school-based context:
* content oriented processing
* producing (pushed) output: formulaic speech
* producing (pushed) output: creative speech
* form oriented processing
* imprinting
* strategical handling: receptive strategies
* strategical handling: productive strategies
The categories are a continuation of Westhoff’s work (Westhoff, 1999), who distinguished, apart from an input component, between content oriented processing, form oriented processing, (pushed) output, imprinting and acting strategically. The traditional distinction between the four language skills (reading, listening, speaking, writing) made in foreign language teaching methodology literature is at odds with the learning activities we propose, a point that will be made clear below.

The importance of these learning activities is that the first step in our critical analysis of a learning task is assessing the nature of the learning activity implied in the task.

**Content oriented processing**

All theories on L2-acquisition acknowledge the necessity of input although different theoretical positions are taken regarding the relative importance of input for L2-acquisition. According to Krashen’s input hypothesis (Krashen, 1981) a language is exclusively acquired by processing meaningful, comprehensible input occurring automatically and subconsciously when the focus is on understanding the content of the language input. Acquisition leads to implicit knowledge and is to be distinguished from learning, which occurs non-automatically and consciously and leads to explicit knowledge. Explicit and implicit knowledge are stored separately in the human memory. As speakers usually make use of implicit knowledge when comprehending or producing the target language, the acquisition of implicit knowledge is most important.

Krashen emphasises the importance of input that is comprehensible plus one. This is input just beyond the current competency level of the learner. Yet, learners can comprehend this level of input by means of the linguistic context, their knowledge-of-the-world and extra-linguistic knowledge. Laufer (1997) operationalises the notion of comprehensibility by stating that knowledge of 95% of the words in a text is minimally required for (modest) comprehension.

Krashen’s hypothesis that the acquisition of new words and structures occurs as a by-product of comprehending spoken or written communication, points to the importance of extensive reading and listening tasks in textbooks requiring the construction of the overall meaning of the text.

Examples of learning tasks focusing on content oriented processing, are tasks in which learners have to summarise the particular text or to answer yes-no questions on specific details in the text. Such tasks apply both to written and spoken texts.
The two-fold character of producing output: formulaic speech versus creative speech

Krashen’s hypothesis that a language is acquired exclusively by processing meaningful, comprehensible input is not generally accepted. Swain (1985) proposes the comprehensible output hypothesis predicting that language acquisition also occurs when learners are asked to express messages in the target language, for which their linguistic means are inadequate. The attempts of learners pushed to use alternative means to get their message across precisely, coherently and appropriately (pushed output), lead to the acquisition of new linguistic means. Empirical evidence supporting the comprehensible output hypothesis is given by the results of immersion studies (e.g. Harley & Swain, 1984). In line with Pica (1989), we use the term output only to refer to extended discourse.

Swain (1995) describes four functions of (pushed) output:

* pushed output enhances fluency in the target language.
* pushed output makes learners aware of gaps in their knowledge of the target language.
* pushed output gives opportunities for the testing of hypotheses on the target language.
* pushed output leads to control and internalisation of linguistic knowledge of the target language.

The literature distinguishes between two types of productive use of language: formulaic speech and creative speech. Although in practice the distinction is not always clear-cut (see e.g. Myles, Hooper, & Mitchel, 1998), a theoretical distinction is feasible. Creative speech refers to rule-governed production of language, whereas formulaic speech refers to the production of non-analysed lexical units (also indicated as phrases, chunks or formulas). Formulaic speech is a very broad term and incorporates both entirely fixed strings (How are you?) and sequences with open slots (Can you ______ ?). Moreover, language formulas can be shared by an entire speech community or can be entirely idiosyncratic (Peters, 1983). Weinert (1995) claims that the phenomenon of formulaic speech in language acquisition is far from marginal, a claim supported empirically by Myles, Hooper, & Mitchel (1998), who reported that formulaic speech contributes to the emergence of creative speech. Consequently, opportunities for using and combining chunks during conversational interaction are very worthwhile.

An example of a learning task focusing on the production of creative speech is a task in which learners have to talk about how they spent last weekend by using the past tense (only creative speech if the sentences to be
produced have not already been learnt by heart). Examples of learning tasks involving the production of formulaic speech are tasks in which learners have to substitute parts of multi-word phrases in a dialogue. In both cases, such output tasks apply both to oral and written output.

**Form oriented processing**

Form oriented processing in L2 can be elicited by a variety of teaching techniques. Spada (1997) uses the umbrella word *form-focused instruction* to refer to “any pedagogical event used to draw the learners’ attention to language form either implicitly or explicitly” and makes a main distinction between explicit and implicit form-focused instruction. Ellis (1986) employs the term *formal instruction* to all attempts in the second-language classroom to raise the learners’ awareness of the nature of target language rules in order to assist learning. We follow Spada’s broad definition.

The positive contribution of form-focused instruction to the acquisition of the target language is well established in SLA-research, e.g. Spada (1997). Studies have established that form-focused instruction leads to an increased rate of acquisition of the target language and to an increased accuracy in the target language. However, the effect of form-focused instruction is, usually, indirect and delayed as the teaching of specific formal aspects does not always result in their acquisition. *The weak interface hypothesis* (Ellis, 1990) explains why the effect of explicit knowledge is (normally) indirect and delayed: explicit knowledge of formal aspects of the target language triggers selective attention to formal aspects in input, which in turn may lead to implicit knowledge of formal aspects of the target language.

Well-known learning tasks focusing on form oriented processing of L2 are tasks in which learners have to infer new target language rules from specific language input and tasks presenting new target language rules and asking learners to apply the new rules in language at the sentence-level. Indeed, the traditional teaching of grammar in foreign language (if oriented towards the comprehension and production of structures at the sentence-level) usually falls into this category of learning activity. In form oriented processing of L2 all four language skills may be involved.

**Imprinting**

Imprinting activities aim at the retention of lexical units (isolated words and multi-word phrases) as well as rules. In this paper we only discuss the imprinting of lexical units. This involves the intentional learning of orthographic and phonological forms, their corresponding meaning and the ability of using the lexical units in their correct syntactic and pragmatic context.
Although the *incidental vocabulary learning hypothesis* predicts that vocabulary can be acquired entirely incidentally (especially if new words occur repeatedly in language input), it has been shown that the intentional learning of vocabulary has a function of its own within the context of school-based foreign language acquisition:

* beginning L2-readers don’t possess a sufficiently large vocabulary reservoir to enable them to guess new words from context when extensively reading texts, see e.g. Laufer (1997).

* the combination of incidental and intentional vocabulary acquisition is superior to the incidental acquisition of vocabulary through reading, see e.g. Hulstijn, Hollander, & Greidanus (1996).

* the acquisition of vocabulary by means of extensive reading is time-consuming, see e.g. Mondria & Mondria-de Vries (1997).

* multiword phrases are not at all learned well incidentally, see e.g. Bahns & Eldaw (1993).

It is generally agreed that intensive and varied processing of new words is required for their retention in the long term, e.g. Stahl & Fairbanks (1986) and Groot (1999). Thus, mental processing should involve different features of the target words, such as morphological, phonological, syntactic, semantic and pragmatic features.

A variety of imprinting tasks has been developed, ranging from tasks involving rote learning of bilingual lists to tasks in which learners have to draw pictures of the new words. In imprinting tasks, each of the four language skills may be involved.

**Strategical handling: receptive strategies**

Most researchers agree that strategic knowledge is an important part of communicative competence (e.g Canale & Swain, 1980), although not all researchers agree whether or not strategies need to be explicitly taught. Researchers advocating explicit strategy instruction suggest that instruction makes learners aware of the nature and potential applications of those strategies learners already possess in their mother tongue. Moreover, it stimulates the use of strategies and provides opportunities for practice so that the use of strategies can become automated.

Apart from these theoretical considerations, there is in the Dutch educational context a pragmatic reason for explicit instruction of receptive strategies. In the revised basic secondary education attainment targets of foreign language learning (Staatsen, Meijer, Mulder, Stoks, & van Toorenburg,
1998) various compensatory interpretation strategies in the domain of reading comprehension and listening comprehension are specified.

It is generally assumed that the effective training of receptive strategies involves both the cognitive domain and the metacognitive domain. Westhoff (1981) states that learners can enhance their metacognitive competence by reflecting on the planning and execution of strategies. His viewpoint is, to some extent, empirically supported by Mulder (1996). Both assumptions carry clear implications for the questions to formulate with respect to tasks in the domain of reading and listening strategies.

Examples of learning tasks focusing on receptive strategies, are tasks in which learners have to guess the meaning of unknown words from context and tasks in which learners have to predict the content of the text by means of title, subtitle and illustrations. Such tasks apply both to oral and written texts.

**Strategical handling: productive strategies**

When speaking of productive strategies in L2, we refer to compensatory strategies. We start from a broad definition. *Compensatory strategies* include strategies used in the case of problems in planning and producing speech and strategies used in the case of communication problems experienced after speech production.

Researchers advocating explicit instruction in productive strategies suggest that instruction makes learners aware of nature and potential applications of strategies that learners already possess in their mother tongue. Moreover, instruction stimulates the use of strategies and it provides opportunities for practice so that the use of strategies can become automated. Finally, application of some strategies may require specific lexical knowledge of the target language, which may have to be taught.

In the Dutch educational context, the revised basic secondary education attainment targets of foreign language learning (Staatsen et al., 1998) specify several productive strategies in the domain of conversation skills. As such, these attainments are another reason why productive strategies should be taught.

At present, research in compensatory strategies is scarce, but some indications for the feasibility of strategy training is reported by Dörnyei (1995) and Cohen, Weaver, & Li (1995).

Examples of productive strategies are paraphrasing and selecting the correct register for starting a conversation.
Learning actions

The preceding paragraph discussed learning activities. We now pass on to the discussion of concrete (learning) actions into which the above mentioned learning activities can be realised. Assessing the nature of the learning action being elicited by the assignment of the learning task constitutes the second step in the critical analysis of learning tasks.

Westhoff (1998) informs us about the relationship between learning activity and learning action by pointing out that there is no one-to-one correspondence between them: a learning activity can be realised by various learning actions and on the other hand a learning action may relate to various learning activities.

Learning actions are actions (usually mental in nature within the context of classroom based foreign language acquisition) being carried out by learners in teaching-learning situations. They are elicited by means of assignments given by the teacher, the learning task, the learner’s classmates or the learner herself. An assignment can elicit either one or several learning actions.

The execution of a learning action results in a concrete product (for instance a summary of a text, a written answer to a question, a spoken dialogue). The carrying out of a learning action is supposed to contribute to the acquisition of new knowledge or skills in the subject matter at hand or the consolidation of already acquired knowledge and skills.

Learning actions are carried out by the processing on materials included in the learning task. In the context of the foreign language classroom the term materials refers to all types of target language input and target language rules. Processing materials involves the handling of specific features of the materials for instance phonological, syntactical, semantic, morphological or pragmatic features.

Westhoff (1996) assumes the effectiveness of a learning action to be dependent on the relevancy of the features of the materials in the light of the intended learning activity as well as the richness in features (number and variety of features) of the materials processed. This assumption carries clear implications for the questions to formulate with respect to the effectiveness of learning actions.

We end this section with a listing of learning actions (table 1) potentially contributing to the acquisition of foreign language communicative competence. We want to emphasise that the list is not meant to be exhaustive. In the table we give only some examples of learning tasks.
<table>
<thead>
<tr>
<th>Learning action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reproducing</strong></td>
<td>Reproducing the lexical units without any changes to the se units (literal repetition).</td>
</tr>
<tr>
<td></td>
<td>e.g. writing down the days of the week in one’s work-book, by copying them from the textbook.</td>
</tr>
<tr>
<td><strong>Ranking</strong></td>
<td>Ranking the lexical units by virtue of a shared feature. The feature will be ordinal in nature. Consequently, the position of the lexical units in the ranking is dependent on the extent to which the feature also applies to the other lexical units. If the name of the feature is not given, then a second learning action is elicited: generalising.</td>
</tr>
<tr>
<td><strong>Categorising</strong></td>
<td>Categorising the lexical units into one or more groups. Groups are being distinguished by virtue of one or more features shared between the lexical units: lexical units put in the same category share at least the distinguishing feature(s) of that category. If the features are not given, then a second learning action is elicited: generalising.</td>
</tr>
<tr>
<td></td>
<td>e.g. choose the odd man out (categorising + generalising).</td>
</tr>
<tr>
<td><strong>Visualising</strong></td>
<td>Linking the lexical unit to a visual representation showing important and representative aspects of the (core) meaning of the particular lexical unit.</td>
</tr>
<tr>
<td><strong>Elaborating</strong></td>
<td>Establishing links between (sequences of) lexical unit(s) and knowledge already stored in the memory. The links are either linguistic in nature and thus based on knowledge of the target language/other languages or logical in nature and based on knowledge of the subject matter/word knowledge.</td>
</tr>
<tr>
<td><strong>Relating</strong></td>
<td>Establishing links between (sequences of) lexical unit(s) being processed. Links may be stated explicitly, but not necessarily so. The links are linguistic in nature and thus based on knowledge of the target language/other languages or logical in nature based on knowledge of the subject matter/knowledge-of-the-world.</td>
</tr>
<tr>
<td><strong>Associating</strong></td>
<td>Establishing links between (sequences of) lexical unit(s) and knowledge already stored in the memory. The links are associative in nature. The links have a more or less idiosyncratic character and are based on the learner’s experiences, feelings, actions, sensations (e.g. smells, tastes), fantasy and creativity on the part of the learner.</td>
</tr>
<tr>
<td></td>
<td>e.g. remembering the gender of French nouns in terms of colours: blue for masculine nouns and rose-coloured for feminine nouns.</td>
</tr>
<tr>
<td><strong>Generalising</strong></td>
<td>Deducing and formulating a rule (or formula, principle, algorithm, heuristic). The rule (or formula, principle, algorithm, heuristic) is deduced by means of one or more shared features of the lexical units. The rule (or formula, principle, algorithm, heuristic) is intended to be used for the production of new (sequences of) lexical units or for the understanding of (sequences of) lexical units.</td>
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Applying
Using explicit knowledge (i.e. an explicitly formulated rule/formula/principle/algorithm/heuristic) either to produce new (sequences of) lexical units or to understand (sequences of) lexical units.

e.g. guessing words from context.
e.g. putting words in the plural (regular nouns).

Recombining
Using implicit knowledge to produce new (sequences of) lexical units either by substituting one or more parts of already encoded lexical units or by combining already encoded lexical units with other lexical units.

Contextualising
Putting the lexical unit in a sentence that is semantically, syntactically and pragmatically well-formed.

Table 1: Learning actions in classroom-based second language acquisition

Strategical handling: receptive strategies

Receptive strategies concern both reading strategies and listening strategies. This paragraph focuses on the analysis of tasks aimed at reading strategies. Questions discussed relate to the explanation, the carrying out and reflection on reading strategies.

Analysing the effectiveness of the learning action is the third step in the critical analysis of learning actions.

Explanation of the reading strategy

Are important aspects of the reading strategy being described?
The learner is given all the specific information required for the understanding (and execution) of the particular reading strategy. The learner should also be informed that carrying out the strategy does not guarantee a successful solution of the reading problem, but promotes it further.
Example: guessing the meanings of new words from context

* The learner is informed not to guess the meaning of every unknown word, but only the words essential to general comprehension of the text. Schouten-van Parreren (1985).

* The learner is informed that comprehension of a word’s meaning may occur at different levels and that comprehension at the highest level is not always required. Curtis (1987).

* The learner is informed to look first for contextual clues in the immediate context (within the sentence) of the unknown word and then to look for contextual clues in the larger context (i.e. other sentences in the same paragraph, sentences in other paragraphs or other chapters). Nation & Coady (1988) and (Groot (1998).

* The learner is informed in what order to use contextual clues. Firstly, clues at the morpho—syntactic level should be used (the syntactic pattern of the sentence and the position of the unknown word in the sentence), next clues at the semantic level (the meaning of the words surrounding the unknown word) and finally clues at the lexical level (the unknown word itself).

* The learner is informed that there are words you can’t guess. It is made clear that looking for contextual clues for the unknown word will not help if there are no clues to exploit, if the contextual clues are not usable, if the clues are misleading or partial, if the clues are easily suppressed by the learner. Examples are provided of non-existent clues, unusable clues, misleading clues, partial clues and suppressed clues. (Laufer, 1997).

* The learner is informed to use all sources of knowledge available when using contextual clues: knowledge of the foreign language, the mother tongue and other foreign languages as well as knowledge-of-the-world

* The learner is informed that guessing does not guarantee success (because the strategy of guessing is a heuristic and not an algorithm).

* The learner is informed that checking one’s guess is necessary and that checking should start at the syntactic level and only then at the semantic level. That is, the learner is informed to verify if the word class of the guessed meaning is identical to the meaning in the text and solely then whether or not the guessed meaning makes sense in the text. Nation & Coady (1988).

* The learner is informed that when using information within the word itself, she should already have made use of contextual information (in order to avoid incorrect guesses based entirely on word form). Nation & Coady (1988).

**Is the learner told how (criteria) to evaluate the applied reading strategy?**

The learner is informed that she needs to verify whether or not the carrying out of the strategy has resulted in the expected result. The evaluation criteria provided should be concrete and their formulation should be clear, concise, unambiguous and comprehensible. The learner should be informed what steps to take when the expected result is not achieved.
Example: guessing the meanings of new words from context
* The learner is informed to check if the part of speech of the guess is the same as the part of speech of the unknown word. Nation & Coady (1988)
* The learner is informed to break up the unknown word into parts and see if the meanings of the parts do relate to the guess. Nation & Coady (1988)
* The learner is informed to substitute the guess for the unknown word and verify if the guessed meaning makes sense in context. Nation & Coady (1988)
* The learner is informed to use a dictionary to check once again the guessed meaning. Nation & Coady (1988)

Other questions concerning the explanation of the reading strategy are:
* Is the learner told when (in which situations) the reading strategy can be applied?

Carrying out the reading strategy

Does the learner have enough knowledge of the target language and enough knowledge-of-the-world to be able to apply the reading strategy? Obviously, the amount of prior knowledge required depends on the type of reading strategy in question.

Example: guessing the meanings of new words from context
* the unknown word occurs in a variety of contexts. Nation & Coady (1988).
* the unknown word is important in the text. Nation & Coady (1988).
* the context of the word is (very) constrained (read: very redundant). This means that the context contains a variety of clues (semantic, syntactic, morpho-syntactic in nature) to the meaning of the unknown word. (Kelly, 1990).
* contextual clues to the meaning of the unknown word can be used, because the learner knows the meaning of these clues. Laufer (1997).
* clues containing by the unknown word itself are not misleading nor partial. Counter-examples are idioms, false friends, words with more meanings than the learner knows and unknown words that resemble very closely words the learner knows the meaning of). Laufer (1997).
* the context of the unknown word is (at least) between five and ten words and there is (usable) context on both sides of the unknown word. Aborn, Rubenstein, & Sterling (1959).

Other questions concerning the carrying out of the reading strategy are:
* Is the learner practising the reading strategy intensively and variedly?
* Is the learner practising the reading strategy in a situation resembling closely situations outside the classroom to which the strategy may be applied?
Reflection on the reading strategy being carried out

Is the learner required to evaluate the reading strategy being carried out? The learner is urged to verify whether or not the strategy has been successful. If the strategy is not successful, the learner is encouraged to undertake new steps so that the evaluation is not an end to itself, but results – if necessary – in further actions of the learner.

Other questions concerning the reflection on the reading strategy are:

* Is the learner required to select an appropriate reading strategy?
* Is the learner required to make explicit why and how she carried out the reading strategy?

Guessing unknown words: a task analysis

In this section we present an analysis of a learning task. We want to repeat that the main objective of our project is to improve the ability of (trainee) foreign language teachers to analyse the effectiveness of printed foreign language learning tasks. This means that the task analysis is not an end in itself. In fact, the project is mainly interested in the learning effect of analysing learning tasks; the products of these analysing processes will be seen and interpreted against this background. The analysis presented here, however, is not realised by foreign language teachers but by the authors of this paper. It is meant to serve as an example of a critical task analysis. However, in the research project we are interested solely in the analyses of learning tasks done by the teachers themselves.

The learning task at hand is selected from a German textbook (Bimmel et al., 1997) frequently being used at lower levels of secondary education in the Netherlands. In this task learners have to guess the meaning of some unknown German words. The analysis presented below applies to the first three parts of our analysis model (see § 2).
### Description of the task

Wenn du ein Wort in einem Deutschen Text nicht verstehst, kannst du versuchen, die Bedeutung zu erraten. Die Tips in Stratego 9 (Textbuch Seite 178) helfen dabei. Im Text hierneben stehen einige Phantasiewörter.

A  Errate bitte, was die Phantasiewörter (ungefähr) bedeuten.
B  Schreib bitte auf, wie du diese Bedeutung herausgefunden hast.

### Schülerin Braunschweig


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<tr>
<th>Phantasiewort</th>
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(in a loose translation by the authors)

### Explanation of the reading strategy

STR 9 in the textbook: Guessing of words: tips (loosely translated from German)

If you meet a word in a German text you don’t know the meaning of, then you can try to guess the meaning (approximately). The following tips may be helpful:

1. don’t concentrate on the word itself.
2. look for word(s) in the context that fit the meaning of the target word. For instance, if you read the following sentence ‘Kräsche sind oft schüchterner als Mädchen’. *Kräsche* is in this sentence compared with ‘Mädchen’. The meaning of the unknown word should fit this word.
3. guess the meaning. In the example above you can guess that Kräsche has to signify boys. You need not always guess the exact meaning. It is usually enough if you guess the approximate meaning.
4. Don’t look at the text. Try to imagine what the text would be if you insert the meaning you guessed. Is this ok with the rest of the text?

(in a loose translation by the authors)
Analysis of the task

1. The nature of the learning activity: The receptive strategy of guessing the meaning of new words.

2. The nature of the learning action: The learning action is applying. The learner is asked to apply a word guessing strategy.

3. The effectiveness of the learning action.

Are important aspects of the strategy being described?
* The use of the meaning of other words in the immediate context is hinted at, but not described in detail.
* The use of the position of the unknown word in the sentence is not described at all, neither the use of the syntactic format of this sentence.
* The use of syntactic or morphological information of the word itself is not described at all.
* The limited length of the text in the learning task (and of the example) excludes the possibility of learning to use the wider context of the unknown word.
* The tip ‘don’t concentrate on the unknown word itself’ is unfortunate. It is meant as an advice to use clues elsewhere in the sentence, but there are cases that the unknown word itself contains useful clues so that there are cases in which concentration on the word itself is very useful.
* The example is somewhat unfortunate: it is not unthinkable that the learner does not understand the word schüchterner: two unknown words in one single sentence complicates the correct guessing of the word Kräsche. Moreover, the example proposes to compare the word Kräsche with the word Mädchen and that the unknown word should fit in with this, a rather vague advice. In the example, this clue could lead to the incorrect guess Kräsche means women.
* The statement that it is not absolutely necessary to guess the exact meaning’ is not relevant. It would have been more accurate to say that knowledge of a word’s meaning may exist at different levels and so does guessing. Consequently, for a general understanding of a text, it is not always necessary to completely understand an unknown word. However, there are cases in which comprehension at the highest level of the word is necessary. In the case of this example, different levels of comprehension of the word Kräsche would have been useful (living human beings – persons – adults – men).
* The assignment refers to Strategy 9 in the textbook. However, there are other guessing strategies possible. For instance, when an unknown word is a cognate or when the unknown word consists of words the learner already knows. This means that a reference to strategy 3 as well as to strategies 14 and 18 in the textbook would have been useful. If not referred to in this task (which could be a deliberate and arguable choice), it is essential this is done in later learning tasks, because an integration of different word guessing strategies is needed.
Does the learner possess enough knowledge of the target language and enough knowledge-of-the-world to apply the strategy?
* This does not seem to be the case. Although the unknown words themselves contain clues (the word category to which they belong is made clear by means of prefix ge- or suffix -en and by their position in the sentence (mein jetziger __; um einem __), the main problem is that there are too many unknown words in the text. Moreover, the four unknown words are presented in only two sentences.
* Another problem is that the words don’t reappear in other sentences.
* A third problem is the fact that the context is not very constraining. The sentence with the word Örkschen could, for instance, be replaced both by the words ‘to like’ or ‘be acquainted with’.

Is the learner required to evaluate the strategy being carried out?
* In the assignment the learner is not asked to verify the guessed meaning by checking if the guess makes sense in the context and the overall story line.
* Neither is the learner asked to consult a dictionary or glossary. However, information on the word guessing strategy in the textbook does hint at a verification stage, but its value is limited as only one checking procedure is described: does the word make sense in the text?
* The use of dictionary or glossary is not mentioned in the explanation of the strategy in the textbook.

References


**Notes**

1 The research project is carried out under the auspices of the IVLOS Institute of Education and the German Expertise Centre.

2 Sequences of lexical units are propositions and groups of propositions in a written or spoken text.